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Performance Evaluation of the Punjab Education Sector Programme (PESP2)

Review of Education Sector Performance: Final Report 2021

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Oxford Policy Management

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INSTITUTE OF DEVELOPMENT AND ECONOMIC ALTERNATIVES

e-Pact is a consortium led by Oxford Policy Management and co-managed with Itad

Acknowledgements and disclaimer

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This is an updated version of a report initially produced in 2018 and initially updated in July 2020. The lead author of the original report was Dr Monazza Aslam. The other team members were Dr Rabea Malik, Fatiq Nadeem, and Neelgoon Safdar, all of IDEAS. The update (to incorporate additional data available) has been led by Neelgoon Safdar. Peter-Sam Hill and Stephen Jones of OPM provided review comments and suggested edits on an earlier draft.

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The UK Foreign, Commonwealth and Development Office (FCDO) was established on September 2nd 2020 through a merger of the Department for International Development (DFID) with the Foreign and Commonwealth Office. This report refers to DFID where this is historically appropriate (i.e. for actions and activities before September 2020), specifically in relation to the normally recognised terminology for the “DFID Six Monthly Learning Assessment”.

Disclaimer

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Executive summary

Purpose

This report has been prepared as part of the evaluation of the UK's PESP2 programme which has been providing support to the Government of Punjab to strengthen the performance of the education system since 2012/13. The purpose of the report is to provide evidence on the main features of the performance of the education system in Punjab over this period, specifically by seeking to answer the following questions:

1. To what extent have there been improvements in educational participation and access?
2. To what extent has educational attainment (learning outcomes) improved?
3. To what extent have the following ingredients of education system performance at the school level strengthened over the period of PESP2:
    a. Preparedness of learners for school;
    b. Effectiveness of teaching;
    c. The provision of learning-focused inputs; and
    d. Effectiveness of management and governance?
4. How has education performance differed in relation to gender, poverty, location and other factors and to what extent has equity in education improved?

This analysis provides information on the context within which PESP2 has been implemented, but also potentially provides a framework for assessing the contribution that PESP2 may have made to progress observed. However, in addition to its potential role in the evaluation of UK support, this report is intended to be directly useful to the Government of Punjab and other stakeholders in the education system in providing an authoritative assessment of evidence on progress and remaining challenges.

The first version of the Review of Education Sector Performance (RESP) was prepared in 2018 as part of the background studies contributing to the First Interim Evaluation Report for the PESP2 evaluation. A selective update based on newly available information was prepared in 2019 to contribute to the Second Interim Evaluation Report in 2019 and a further update for the draft Final Evaluation Report in 2020. This update has been undertaken as part of supplementary analysis for the Final Evaluation Report and includes some additional data for 2020. It should be noted that the only one data source (EMIS) is available that covers a period following the school closures during 2020 in response to the Covid-19 pandemic.

Methodology

In answering these questions, this report aims to present evidence from the start of PESP2 (in 2011/12) to the most recent data available (usually 2018/19 but in some cases up to 2020) to

summarise: a) what the evidence suggests regarding the broader question and the more specific questions above and b) the quality of the evidence (with respect to the indicators that can be calculated and the extent to which these help answer the questions posed above).

The presentation of the data evaluation draws on the Conceptual Framework based on the 2018 World Development Report on Learning (WDR 2018) which identifies **four key school-level ingredients for learning**:

- Prepared learners;
- Effective teaching;
- Learning-focused inputs and
- Skilled management and governance.

This report has undertaken data analysis drawing on the Data Quality Assessment (DQA) which took place during the Inception Phase of the Evaluation. The DQA involved initial assessment of data quality based principally on desk analysis of documentation and examination of raw data and published results; and additional analysis of the quality of data systems, focusing on sources that have been identified as most important and/or problematic during the initial assessment, and potentially involving some primary investigation. This was undertaken for both survey and administrative data sources.

The analysis of data has been undertaken as follows:

- Identification of core data sets from the Inception Phase.
- Mapping the data sources against the Conceptual Framework.
- Undertaking extensive data analysis using core indicators. Some of the data sets focus only on the Punjab whilst others collect data nationally. It was agreed to compute the relevant indicators only on the Punjab with more limited analysis on other provinces/regions to provide a cross-province/region picture.
- Combining the sources from different data sets where appropriate.
- Consulting organisations directly for assistance in interpreting findings (e.g. ASER data).
- Supplementing data analysis with data from reports/mimeographs where relevant to provide a more comprehensive answer to the questions posed in this report.

Data sources used

This report presents a detailed summary of the evidence based on extensive analysis of data sets mainly in the Punjab (with some evidence on variations in key statistics by province/region). Raw data from the following data sets has been used to develop indicators that have then been used to answer the above questions:

- The **Nielsen (Punjab School Education Survey - PSES) household data set** covered nine waves of 36,000 households, on average, between November 2011 and March 2017 (slightly different questionnaire in the last round).

- The **Learning and Numeracy Drive (LND) data**: monthly testing. A number of different tests and questionnaires have been used for this and it covers the period September 2015 to February 2020. This is a school-based data set.

- **DFID's six monthly learning assessment (6MA) data**, covered the period September 2014 – March 2018. This is a school-based data set.

- **Annual Status of Education Report (ASER)** produced annual waves of data from 2012 to 2019 (with the exception of 2017). This data set collects information both from households and schools. Children are assessed on basic literacy and numeracy, and both household level information collected (assets, maternal education, education levels completed) and school level information is gathered (teacher qualifications, enrolments etc.)

- **Pakistan Social and Living Standards Measurement (PSLM) Survey**, 2012-2018. This is an extensive household-level survey with very detailed information collected on household incomes, expenditures, education levels of various household members etc.

Data availability has decreased over the course of this evaluation as the Nielsen household survey and DFID 6MA are no longer being conducted.

In addition to analysing raw data from these, we have also where possible used data from other published and unpublished research (without a formal assessment having been made of its quality). This includes:

- **Teaching Effectively All Children (TEACh),** ESRC/DFID funded data (ES/M005445/1); household and school-based data on rural children aged 8-12 years old from three districts in Punjab. Data are cross-sectional and available for 2016-2017 (with children in schools in Grades 3-5 assessed at the beginning and end of the school year). Extensive detailed information on teachers was also collected. Children in schools provided self-reported measures of wealth. The data from TEACh have been collected by IDEAS and the University of Cambridge and are not yet publicly available. Nevertheless, findings and published articles are reported as they help inform this evaluation in invaluable ways.

- **Multiple Indicator Cluster Survey (MICS),** conducted every three years from 2011-2017 for Punjab. This is an extensive household-level survey led by UNICEF, and maps the situation of women and children around the world. The access indicators have been calculated from the raw data in line with the analysis of DQA I data sets, while the remaining indicators discussed in this report draw on reported statistics in publicly available reports.

- **SABER Service Delivery (SD)** tool, developed by the World Bank, studies barriers to student learning outcomes in primary schools in Punjab. Data was collected for a convenience sample of six districts that is representative of North, Central and South Punjab. Data was collected on schools, children, teacher, principals and parents in 2018 to understand components of the WDR 2018. Preliminary findings from the initial data release are discussed here.

- **Punjab Examination Commission (PEC)** published reports. Exam result analysis reported on the PEC website has been drawn on where possible. PEC also conducted a Provincial Assessment of Student Learning (PASL) 2018-2019 that links student learning with teacher competence and teaching practice, providing useful information for understanding teacher effectiveness.

The following administrative data sets were analysed:

- **Annual School Census (ASC)/ Education Management Information Systems (EMIS)** data (2012-2020). This is a mandatory data collection exercise for all public schools in the Punjab, providing reliable information for policy making. The modules include a detailed school information sheet, along with a teacher and student roster. Limited provisional results from the 2020/2021 school year were made available to analyse.

- **Private Schools Census (PSC)** data (2011 and 2016). While there is no legal obligation for private schools to provide data, this exercise aims to gather data on all private schools in Punjab. The survey is a sub-set of the EMIS survey and gathers basic data on school characteristics, enrolment and staff.

Has educational participation and access improved?

This analysis is based on PSLM, Nielsen, ASER and MICS data, along with administrative EMIS and PSC data sets covering the 2011-2019 period. Using these data sets, we have been able to calculate three indicators of access – education participation rates, gross enrolment rates and net enrolment rates for various age groups, for male and female children, by socio-economic status and by location, where possible.

A larger percentage of children in the Punjab are *in* school but they are not always in the appropriate grades for their age

The analysis of access indicators has shown that the percentage of **children in the Punjab attending school has increased**. Participation rates have been growing over the period, which shows that children aged 5-16 years are now more likely to be attending school. However, whilst participation in schooling seems to have improved, the pattern of enrolment rates indicates that there are still many children who are not attending schooling in the appropriate grade for their age band (and this is reflected in stagnant or declining gross and low net enrolment ratios).

Educational access differs by location, by gender, and by socio-economic and disability status

There are differences in educational access by region (with children in rural areas accessing education far less than their urban counterparts) and for girls (with girls often less likely to participate in schooling than boys). Regardless of which indicator is used to measure access, wealth appears as a clear marker of disadvantage within the province with the rich far more likely to be accessing schooling than the poorest. The analysis of richer data, albeit from only three districts of the Punjab, also reveals that disability can be a deterrent to accessing schooling especially for the poor and for girls.

There seems to have been some success in getting the poorest into schools but not always in retaining them in school

The province has also been more successful in getting the poorest children into schools but not always successful in ensuring they enter the grades appropriate for their age and not always successful in ensuring they remain in the schooling system to ensure completion.

There is an increasingly larger share of school-age children in private schools

Analysis of participation and enrolment over this time period shows an increasing share of the private sector in education, across schooling levels. Mixed results are evident on the trend for the public share of education with certain data sets pointing towards a decline and others pointing towards an increase (household versus rural and census data).

Available access indicators have limitations

The access indicators – participation rates and gross and net enrolment rates – are snapshots at a point in time. They can also have differing values depending on how they are calculated so they need to be interpreted with caution. For example, a Gross Enrolment Ratio (GER) can exceed 100% due to the inclusion of over-aged and under-aged students. Participation rates are calculated as the percentage who report participating in school, regardless of the grade. They can be calculated for any age group and not just for the official school-age population, as is the case for GERs. Therefore, participations rates could vary significantly from enrolment rates.

There are also differences in how socio-economic status is measured between sources. Some data sets do not collect suitable measures to allow disaggregation whilst others use excessively simple indicators. It is important to understand which children are participating more in schooling as well as aggregate numbers. It could be that the greater participation reflects entry by more marginalised children but once they are in school, it becomes even more important to ensure they receive quality learning opportunities so that they can attain the skills required for smooth progression through schooling rather than dropping out.

Have learning outcomes improved?

This analysis covers 2012-early 2020 using LND data, DFID 6MA data and ASER data (mainly rural). The first two of these data sets collects learning outcomes data for Grade 3 pupils whilst the latter collects pupil outcomes information for all children aged 5-16 years (on Grade 2 and some Grade 3 competencies). Data are mainly collected on literacy and numeracy (English, Urdu and Maths mainly with some variations in ASER which focuses more on basic skills depending on which part of the country children are assessed in) and are either school based (LND and DFID 6MA) or household-based (ASER). Reported data from TEACh, PEC, MICS and SABER SD survey is also discussed.

Learning outcomes from school-based data show some improvements (2014-early 2020) with differences by location, gender and school type

There have been some gains in learning outcomes in the province (LND/DFID 6MA) and across most competencies during the period in which data are available. There are differences by location, gender and school type.

Small improvements in learning outcomes do not necessarily signify failure

The data have shown some progress for the limited set of skills that are assessed. When interpreting results, it is important to remember that we do not have evidence about other aspects of children's learning and development. We should also be aware that learning progresses in a complex and non-linear manner so it is helpful to observe gains over a suitably long time period[1].

Another critical point to note is that understanding whose learning is being assessed becomes all the more important in light of progress in the enrolment of disadvantaged children. These children tend to have poorer learning outcomes so we would expect an improvement in enrolment of the disadvantaged to have a negative effect on measured learning outcomes if the quality of schools does not change. The success lies in getting these children into school, followed by retaining them long enough in the system to show meaningful improvements in learning. The fact that it has not been possible to identify the socio-economic profile of the assessed students is a significant weakness of both the LND and the DFID 6MA data sets.

Rural ASER data paints a less optimistic picture of learning in the Punjab with some recent improvements

ASER data provides mainly a rural data set that reports learning outcomes as scaled scores (a child is able to read nothing, a child is able to read a word etc.), shows poor levels of learning with some improvement in 2018-2019. Large proportions of school-aged children unable to achieve the most basic outcomes in literacy and numeracy. This data set also allows for a more nuanced analysis of learning outcomes by allowing disaggregation by socio-economic status. Wealth emerges as a strong predictor of performance, especially so for girls – the poorest girls in rural Punjab have the worst learning outcomes. There have been some improvements – the gap between poorest girls and poorest boys has diminished in 2018-2019. Furthermore, the gap between the poorest quintile and the richest quintile, while persistent, has narrowed over time. Limited data (MICS) shows that children in urban areas outperform their peers in rural areas, particularly in terms of literacy.

Children do learn more in school than out of it

Even in relatively poorly performing education systems, there is a positive relationship between schooling and learning (WDR 2018). Getting children into schools improves their chances of learning and this is clearly the case in the Punjab. This is not to question the extent of the "learning crisis" in the province – learning levels even for children who are in school remain low. Nevertheless, getting them into school and retaining them for the full cycle in a good quality environment is fundamentally important.

The evidence on learning outcomes is insufficiently complete, representative, or disaggregated to allow firm conclusions about trends to be drawn

These data sets have certain limitations. The LND data reports school-level averages and the DFID 6MA data has student-level averages. A reasonably high percentage of responses are correct and there are marginal improvements over time. It is worth noting that school-level outcomes are likely to mask both progress as well as disparity in that improving averages could be driven by a few

[1] Some researchers suggest measuring the same child's progress at two points in time to be able to assess 'value-added' in learning.

students (especially if they are deliberately selected to be assessed) in which case they are not illustrative of any real improvements in learning outcomes. However, even small improvements in outcomes that truly represent the entire age group are likely to be more illustrative of system-wide improvements.

This report highlights it is important to identify the characteristics of the students in the samples. If the pupils who are being assessed are from particularly disadvantaged backgrounds, even marginal improvements in learning outcomes reflect equitable system wide changes (in that not only are these children accessing schools but also showing improvements in learning). The fact that it is not possible to disaggregate the LND and DFID 6MA data by socio-economic status is a key limitation of these data sets.

ASER data report outcomes in a different way, which does not allow comparison across these data sets and ASER data are far more simplistic in terms of how outcomes are measured. ASER data is not comparable over time.

Are learners prepared for education?

This sub-section of the report calculates very rough proxies of 'learner preparedness' using mainly ASER and MICS data along with administrative EMIS and PSC data (2011-2019). It is recognised that the notion of a 'prepared learner' entails a complex array of factors (such as a well-nourished child who is stimulated sufficiently from a young age to enter schooling prepared for it). For this limited reported data from MICS (2011-2017) on nutrition, early child development and home environments is used.

Pre-primary enrolment in the Punjab has shown a marginal increase during the past few years, but majority of children 3-4 years are not participating in formal learning

The data reveal that pre-primary gross enrolment in the Punjab has increased from 79.4% in 2011 to 115.6% in 2017 according to MICS (rural data from ASER shows no improvement). Growth in net enrolment has been slower, implying that an increase in children attending pre-primary classes has not necessarily been at the age-appropriate level. Whilst richer pupils and those in urban areas are more likely to access pre-primary schooling, with gaps by location declining over time. The share of private schools in pre-primary enrolment has increased such that the more than half of pre-primary GER is attributed to the private sector in 2016. Pupils in the Punjab also appear to be attending schools fairly regularly.

Early childhood development lags in literacy and numeracy in Punjab

In terms of early childhood development, children 3-4 years lag significantly behind in basic literacy-numeracy tasks with only 27.2% having basic familiarity with the alphabet, simple words and numbers in 2017. Moreover, evidence shows that children entering Punjab's schools are not appropriately nourished and stimulated. Although the nutrition and health of children under 5 has improved between 2011 and 2017, gaps remain. Persistent wealth gaps indicate that poorer children are set on a low growth trajectory.

There is limited support for learning in the household with gaps by wealth and location

Limited evidence shows low learning support for both children under 5 in terms of availability of materials (books) and early stimulation activities with adult household members. Similarly, children 7-14 years lack a conducive learning environment at home as well as parental support for learning at school. Wealth and regional disparity is evident with children from richer households and urban areas better prepared for schooling.

There is limited good data to measure 'learner preparedness' in the Punjab

'Learner preparedness' is a fairly broad concept, comprising all physical, mental and socio-emotional development that helps a student to learn when they get to school. Good nutrition is necessary to enable the brain to develop properly. Similarly, appropriate care and stimulation during the first years of life aid brain development. Much of this needs to take place within the home and communities, but pre-schools play a role in providing mental stimulation and preparing children to behave in a way that is appropriate within schools.

Existing pre-primary access data must be supplemented with data on the diverse range of early childhood programmes. For a more nuanced understanding, we discuss MICS reported data in the latest revision to RESP as MICS provides robust estimates that are representative for Punjab. Although this does not provide a comprehensive review of changes over the evaluation period (certain early childhood indicators are only available in the latest one or two rounds), such indicators simply do not exist in the data sets identified in our DQAs. While preparedness is difficult to measure, comprehensive indicators in the latest round of MICS are improving data quality.

Has the effectiveness of teaching improved?

Data on proxies for effective teaching are available from the ASER, EMIS and PSC data sets (2011-2019). We also report on some crucial evidence from the TEACH project, a DFID/ESRC funded project in three districts in Punjab, that has gathered far more nuanced data than is available from these large-scale data sets on 'effective teaching'. Similarly, the PEC's PASL report and preliminary findings from SABER SD's classroom observations is also used. Teacher attendance rates, percentage of 'qualified teachers', teacher experience, teacher responses to training received during pre-service training, teacher competence and teaching practice in the classroom are some of the proxies used to assess 'effective teaching' in the province.

Teacher attendance in (rural) Punjab has consistently averaged more than 85% during 2012-2019

The data indicate that more than 85% teachers are consistently in attendance when an enumerator has visited. For learning to take place, the most critical factor is the presence of a teacher in the school. However, teacher presence in school forms only one aspect of 'teacher effort' and is likely to be influenced by numerous factors (such as distance to school, number of dependents in the household, official non-teaching duties the teacher might need to do, health etc.).

More qualified teachers have been hired in the province over the last few years

The data also reveal a sharp upward trend in government teachers with at least a graduate qualification in the Punjab during the 2012-2019 period. EMIS data reveal similar trends and also show that on average, a government school teacher in the province has about 8-9 years' experience

in the sampled school and around 14-18 years' experience in the School Education Department. Average experience has decreased in 2018, indicating new teacher recruitments.

But limited data suggests that teachers are not sufficiently prepared to teach challenging classrooms

TEACH data has revealed that teachers in the Punjab are not always well prepared to address the challenges they face in their classrooms. A large percentage of sampled teachers have reported that their pre-service training did not provide them with any training for multi-lingual settings (47%), diverse classrooms (47%), working with poor children (44%) or children with special needs (58%).

Limited data also shows that teacher are not fully competent in the curriculum, unable to transfer their knowledge to students and do not show good teaching practices

Limited data shows that not only are teachers not fully competent themselves in teaching the curriculum they are meant to be teaching to Grade 3-5 pupils, but often they are also not fully able to transfer their knowledge to their students. Classroom observations show that while teachers are able to create a positive classroom culture, they rarely follow instructional techniques and provide socio-emotional support in the classroom.

Large-scale data sets in Pakistan do not capture fundamental aspects of 'teacher effectiveness'

The ASER and EMIS data sets are able to provide information on measures that are not always fully able to capture teacher effectiveness. Teacher attendance rates and qualifications only provide very crude proxies of teacher characteristics that might equate to 'effectiveness'. Arguably, teacher attendance is a proxy of effectiveness in that it proxies for teacher 'effort' through presence in school. The way the data are collected on this particular measure, as with pupil attendance, is also more superior to asking teachers or headteachers to report on attendance. However, as with the pupil attendance measure, it only captures a 'snapshot' measure of teacher attendance on any given day and may not capture more systemic absence for teachers which may arise due to them being absent due to election duties or such activities or even during harvesting season. Teacher qualifications also provide a very crude measure of effectiveness in that research has consistently shown qualifications to not matter for pupil learning (Aslam and Kingdon 2011, Aslam, Rawal and Jamil, 2013 using data from the Punjab show this to be the case).

More useful measures of 'effectiveness' would capture teacher competency, the teaching process within a classroom and teachers time on task to actual activities within a classroom and be able to link it to pupil learning gains effectively. With teachers forming the most critical input into a child's learning experience, school quality is directly associated with 'teacher preparedness' In this regard, TEACh, SABER SD and PEC PASL data are far more suitable by being more comprehensive and nuanced. Additionally, to fully capture teacher effectiveness and its impact on student learning, it is important to be able to link a given teacher who teaches a student to her student. ASER and EMIS data are unable to do this. TEACh data, on the other hand, is able to achieve this but its greatest limitation lies in being non-representative of the Punjab as it only captures information from three districts and is on a small sample of teachers. The PEC PASL data also links student and teacher in the classroom on learning. Furthermore, the SABER SD exercise conducts classroom observations, providing data on teaching practice and methods in the classroom. Statistics are representative for Punjab and provide a comparison between teachers (in public, private or PEF

schools). However, these data sets are only available for one year and data on the process of teaching and teachers' time on task both in the classroom and outside it is critically missing from all of the large-scale data sets.

Has the provision of learner-focused inputs in schools improved?

Data on 'learner inputs' is available in ASER, EMIS and PSC data (2011-2020). Physical infrastructure-related inputs proxy for the indicators capturing provision of 'learner focused inputs'. These include measures such as the availability of drinking water, boundary walls, playgrounds, usable toilets, student-useable toilet ratios, condition of the school building, and student-classroom ratios.

There have been some improvements in the provision of physical infrastructure in Punjab's schools

The evidence indicates some improvements in physical infrastructure inputs in rural Punjab (ASER data) over 2012-2019 (particularly for playgrounds, computer labs, and laboratories). The more comprehensive school census/EMIS data from urban and rural Punjab also reports improvements in school facilities. More schools have electricity and there are more useable toilets for students (average of 67 pupils to one useable toilet in 2012 as compared to 45 pupils to one toilet in 2019). The condition of government school buildings have also shown improvement in this period. However, the number of pupils per classroom has fluctuated, showing a slight increase from an average of 41 children per classroom in 2012 as compared to 44 children per classroom in 2019.

There is no comprehensive data on fundamental learner-focused inputs such as materials

The main strength of the data analysed in this sub-section lies in the scope and coverage – both ASER data and in particular the ACS/EMIS data cover very large (or all government) schools in the Punjab and allow reporting on the inputs specified above. There are, however, some crucial weaknesses of the data. One fundamental weakness is in the limited types of inputs the data sets are able to present information on. In particular, none of the data sets collect information on availability of learning materials or textbooks per pupil. The indicators also do not provide a nuanced understanding of the extent to which inputs are available. For example, ASER data only ask 'yes/no' responses on whether a boundary wall is available, whether a useable toilet is available etc. without confirming the quality of these inputs. The EMIS data attempts to collect this information in a somewhat more nuanced manner.

Has the the effectiveness of school management and governance improved?

Some information on school management practices is taken from a research study of 89 government schools. Similarly, preliminary findings from SABER SD on principal's knowledge of school problems is also discussed. DSD collects information on the frequency of DTE visits, but the data sets were not available for analysis. Data on SMCs and non-salary budget are taken from the EMIS database.

Insufficient information is available to draw any clear conclusions about the effectiveness of school management and governance and how this has changed over the evaluation period

There is some limited evidence that assessments are being used to track students and rank schools in an effort to create mechanisms for data driven planning and create incentives for schools to focus on learning. However, there is a long way to go both in terms of effective planning based on learner needs at the school level, and empowering and capacitating school heads and teachers to use learning data to focus on children struggling with learning. The methodology underlying testing processes is discussed in the section on learning.

Introduction of the non-salary budget reform improves the efficiency of school financing mechanisms by getting funds directly to schools bypassing bureaucratic hurdles. Underspending remains a concern at the school level. This issue is linked with questions around the management capacity and support at the school level.

Teacher attendance has improved in government schools but there is little readily usable information available on teacher effort and time on task in class. QAED has mechanisms in place to collect this information and there is some anecdotal evidence that this information is being fed into teacher training content and mechanisms. However, information/data from these mechanisms is not available for engagement by researchers and evaluators, it is not being systematically tracked, and it is not fully integrated into the thinking about improvements in operational management and governance at the school level.

Limited evidence suggests that primary head teachers are not prepared for their role (through pre-service or in-service training), and lack realistic knowledge of teacher and student performance in their school.

Large scale data sets in Pakistan do not capture good quality information on key aspects of school management and governance

Quality of management at the school level incorporates aspects of operational practices, monitoring processes and outcomes, and people management. Data collection systems of the government departments and independent surveys do not collect any information at the school level on these aspects. The ACS/EMIS data collects information on some aspects, including development expenditures and frequency of school council meetings, though the quality of the data is questionable. Preliminary findings from SABER SD shed light on principal knowledge of school problems but this data is available for 2018 only. Furthermore, available indicators are very crude proxies for judging effectiveness of governance and management.

Key conclusions

This report has reviewed and assessed data sets that collect information over time on key aspects of education within the country (and specifically within the Punjab). These range from large-scale household surveys mainly collecting information on education access to school-based data sets that aim to assess children's learning outcomes in the primary years. This report has also analysed data collected by a citizens-led initiative which has collected information at a country-wide scale on both access and learning outcomes both from households and from schools. In addition to these data sets, the report has also discussed some illustrative findings from smaller-scale data sets which have collected far richer data on key indicators and aspects considered important in this report.

The report had aimed to answer specific questions and identify the extent to which particular ingredients of education system performance at the school-level might have strengthened during the

PESP2 period as they relate to: preparedness of learners for school, effective teaching, the provision of learning-focused inputs and the effectiveness of management and governance. The report also aimed to identify the extent to which education participation and attainment had improved during the PESP2 period. The key findings relating to each have been summarised above. In summary, education system improvement within the Punjab during the PESP2 period has been mixed. There have been some gains (more children in school) but there are numerous challenges (children in school not always in appropriate grades for their age; learning outcomes are low for many; access and outcomes are inequitable etc.). Perhaps the clearest message from this analysis is that the data sets that exist in the Punjab do not allow us to directly answer all the questions that have been posed in this report. This is due to the following reasons:

- In looking at educational access and participation, it is important to know more about the children who are entering schools. This requires more nuanced background information to be collected which does not always exist.

- We do not know enough about retention and repetition from the data sets analysed to truly capture the extent to which children who enter school go through a full cycle of education.

- Learning outcomes data are also reported in ways that are not always meaningful.

- For much of our analysis, we have had to rely on proxies that are poor, often meaningless. This is because data sets do not fully capture those elements that can help us fully answer the questions that are important for us. One example is provided by 'teacher effectiveness', another by 'school management and governance'. In both instances, we have had to rely on very weak proxies as the data simply do not exist.

- It may be possible to improve the quality of some of the existing initiatives in order to overcome some of these limitations. For example, the LND data set collects information on learning outcomes. Supplementing the learning outcomes information with pupil and parental questionnaires to allow family background information to be collected and linked to each child would be a useful approach. Information on disability and special educational needs has not been systematically collected by government. Ensuring that the learning outcomes data are collected on a random sample of children and following the same children over time would also provide far richer information with a more longitudinal sample.

- Recent improvements in public sector data management through the School Improvement Framework (SIF) are a step in the right direction. The SIF is pooling data from existing app-based tools to inform decision making at the school, sub-district, district and provincial levels, enabling stakeholders to take evidence based action. The SIF is being rolled out across the province in 2021, so its effectiveness in practice remains to be judged.

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AEO	Assistant Education Officer
AEPAM	Academy of Educational Planning and Management
ASC	Annual School Census (also known as EMIS)
ASER	Annual Status of Education Report
B.Ed	Bachelors of Education
COT	Classroom Observation Tool
CPD	Continuous Professional Development
CT	Teaching Certificate
DFID	Department for International Development
DFID 6MA	DFID Six Monthly Learning Assessment
DQA	Data Quality Assessment
DQAF	Data Quality Assessment Framework
DSD	Directorate of Staff Development
DTE	District Teacher Educator
ECE	Early Childhood Education
EMIS	Education Management Information System
EQ	Evaluation Question
ESRC	Economic and Social Research Council
FCDO	Foreign, Commonwealth and Development Office
GER	Gross Enrolment Ratio
HIES	Household Integrated Economic Survey
LFPS	Low Fee Private School
LND	Learning and Numeracy Drive
M.Ed	Masters of Education
MEA	Monitoring and Evaluation Assistant
MICS	Multiple Indicators Cluster Survey
NER	Net Enrolment Ratio
NSB	Non-Salary Budget
OPM	Oxford Policy Management
PASL	Provincial Assessment of Student Learning
PEC	Punjab Examination Commission
PEF	Punjab Education Foundation
PESP2	Punjab Education Sector Programme II
PISA	Programme for International Student Assessment

PKR	Pakistani Rupee
PMIU	Programme Monitoring & Implementation Unit
PSC	Private School Census
PSES	Punjab School Education Survey (Nielsen)
PSLM	Pakistan Social and Living Standards Measurement Survey
PTC	Primary Teaching Certificate
QAED	Quaid-e-Azam Academy for Educational Development
SABER	Systems Approach for Better Education Results
SC	School Council
SD	Service Delivery
SES	Socio-economic Status
SIF	School Improvement Framework
SIS	School Information System
SLO	Student Learning Outcome
SMC	School Management Committee
SSA	Sub-Saharan Africa
SSI	School Status Index
STR	Student-classroom ratio
TA	Technical Assistance
TEACh	Teaching Effectively All Children
TOR	Terms of Reference
WDR	World Development Report

1 Introduction

1.1 Purpose and scope of the report

This report has been prepared as part of the performance evaluation of UK support to education in Punjab through second phase of the Punjab Education Sector Programme (PESP2) which has run from January 2013 to July 2021. The purpose of this report is to provide evidence on the main features of the performance of the education system in Punjab over this period, specifically by seeking to answer the following questions:

1. To what extent have there been improvements in educational participation and access?
2. To what extent has educational attainment (learning outcomes) improved?
3. To what extent have the following ingredients of education system performance at the school level strengthened over the period of PESP2:
    a. Preparedness of learners for school;
    b. Effectiveness of teaching;
    c. The provision of learning-focused inputs; and
    d. Effectiveness of management and governance?
4. How has education performance differed in relation to gender, poverty, location and other factors and to what extent has equity in education improved?

This analysis provides information on the context within which PESP2 has been implemented, but also potentially provides a framework for assessing the contribution that PESP2 may have made to progress observed. In addition to its potential role in the evaluation of UK support, this report is intended to be directly useful to the Government of Punjab and other stakeholders in the education system in providing an authoritative assessment of the available evidence about progress and remaining challenges in education.

The first version of the Review of Education Sector Performance (RESP) was prepared in 2018 as part of the background studies contributing to the First Interim Evaluation Report for the PESP2 evaluation. A selective update based on newly available information was prepared in 2019 to contribute to the Second Interim Evaluation Report in 2019. A comprehensive revision of the original RESP report was prepared to contribute to the draft Final Evaluation Report in 2020. This report contains a further revision to include some additional data for 2019 and 2020, though it should be noted that only the 2020 EMIS provides any data that covers the period following the closure of schools in Punjab in response to the Covid-19 pandemic – in particular no data is yet available on the impact of school closure on learning outcomes. Annex A provides details of the main changes to the data and to the overall assessment of education sector performance in Punjab in this revised edition compared to the original version in 2018.

1.2 Process and methodology

This report follows on from the production of two Data Quality Assessments (DQA) that took place during the Inception Phase of the Evaluation. DQA I reviewed the survey data sources for education. DQA II reviewed the administrative data on education, using a rigorous methodology to draw conclusions about the quality of the data sources. Further details on the DQA are provided in Section 2.3.1 below.

This report uses the sources analysed in the DQA to assess what conclusions can be drawn about progress on key education sector indicators, taking account of the quality of different sources and attempting to explain and resolve differences between measures of the same indicator from different sources. This analysis has involved the following steps:

- Identification of data sets from the DQA.
- Mapping the data sets against the categories identified in Conceptual Framework (see section 2.1 below).
- Undertaking extensive data analysis for core indicators. Some of the data sets focus only on the Punjab whilst others collect data nationally. In these cases the relevant indicators have been computed only for the Punjab with more limited analysis on other provinces/regions to provide a cross-province/region comparison.
- Combining the analyses across data sets.
- Consulting organisations responsible for data collection for assistance in interpreting findings (e.g. ASER data).
- Supplementing data analysis with data from published or unpublished research where relevant to provide more comprehensive answers to the questions.

This main report presents the key findings from the analysis with details contained in the Annexes.

1.3 Report structure

The remainder of this report is structured as follows. Chapter 2 summarises the Conceptual Framework underpinning the analysis in this report and maps the data sources to the analytical categories in the framework. Chapters 3 to 8 present the data analysis for each of these categories: access to schooling and participation (chapter 3); pupil attainment (chapter 4); preparedness of learners (chapter 5); effectiveness of teachers (chapter 6); availability of learner focused inputs (chapter 7); and the effectiveness of school management and governance. Chapter 9 presents conclusions and implications.

Additional information is included in the following Annexes. **Annex A** explains the changes between the original RESP report in 2018 and this final version. **Annex B** provides a summary of the DQAs. **Annex C** presents the analysis of the Pakistan Social and Living Standards Measurement Survey (PSLM 2012-2018), **Annex D** the Nielsen (Punjab School Education Survey - PSES) Household Survey (2011-2017), **Annex E** the Annual Status of Education Reports (ASER household and school survey data 2012-2019), **Annex F** the Multiple Indicators Cluster Survey (MICS 2011-2017), **Annex**

G Learning and Numeracy Drive data (LND 2015-2020), **Annex H** DFID's Six Monthly Assessment (6MA) data (2014-2018), **Annex I** the Annual School Census/Education Management Information Systems data (ASC/EMIS 2012-2020), and **Annex J** the Private School Census (PSC 2011 & 2016). **Annex K** provides a summary of the wealth indexes that have been created.

2 Structuring Data Around School Level Ingredients of Learning

2.1 The 2018 World Development Report

The 2018 World Development Report (WDR), the first to focus exclusively on education, argues that there is a global "learning crisis" related to the fact that the substantial achievements in improving access to education is not leading to sufficient improvements in learning outcomes, especially for the poor and disadvantaged. The WDR notes that educationists and policy-makers increasingly recognise that 'schooling is not learning', and that 'schooling without learning is not just a wasted opportunity, but a great injustice'. The rapid expansion of schooling globally has come at a huge cost – millions of children worldwide attend school and often 'graduate' from school without acquiring basic literacy and numeracy skills. This 'learning crisis' is apparent across the world.

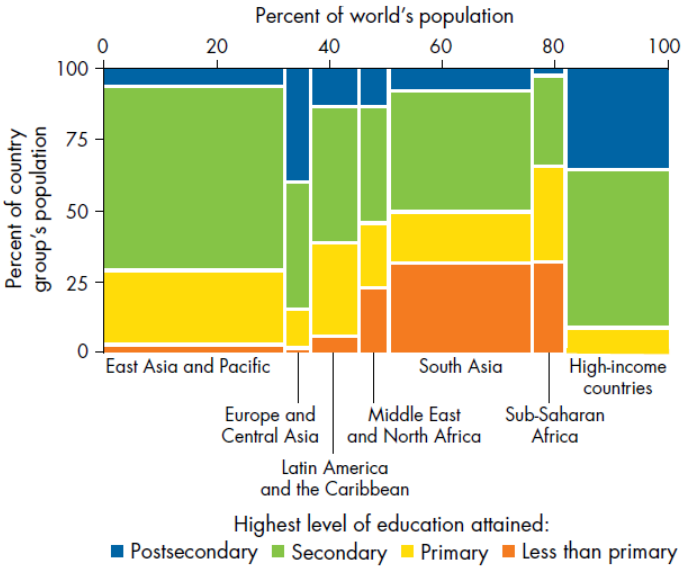
The WDR (2018) recognises three key dimensions of the 'learning crisis':

1. The first dimension of the crisis is the **poor learning outcomes themselves**.
2. The second dimension of the learning crisis is its **immediate causes**:
    a. Children arrive unprepared to learn.
    b. Teachers often lack the skills or motivation to teach effectively.
    c. Inputs often fail to reach classrooms or to affect learning.
    d. Poor management and governance often undermine schooling quality.
3. The third dimension of the crisis is its **deeper systemic causes**.

The WDR (2018) also recognises that whilst huge strides have been made in getting children into primary schools across the globe, South Asia continues to house the largest population of individuals with less than primary education. Figure 1 illustrates this. Getting children into schools and retaining them there continues to remain a serious challenge in Pakistan and in the Punjab. 'Poverty, gender, disability, ethnicity and location' remain the most critical factors explaining persistent disparities in educational access across the globe (WDR 2018).

Figure 1 Most people with less than primary education are in South Asia

Stock of educational attainment (ages 15–64), by country group (2010)



Source: WDR 2018 team, using data from Lee and Lee (2016). Data at http://bit.do/WDR2018-Fig_2-2.

2.2 Conceptual Framework for the PESP2 evaluation

The insights from WDR 2018 have been used to develop a conceptual framework for the PESP2 evaluation. The purpose of this framework is to provide a normative basis for assessment of actual education system performance in Punjab (and the extent to which the components of PESP2 have contributed to strengthening the education system) that reflects the evidence about requirements for an effective learning system that is captured in WDR 2018.

WDR 2018 identifies four key school-level ingredients for learning:

- Prepared learners;
- Effective teaching;
- Learning-focused inputs and
- Skilled management and governance.

WDR 2018 also emphasises that the education system needs to be both **aligned** on the goal of learning (rather than on other objectives), and **coherent** in pursuing this goal. WDR (2018) argues that (p. 171) "incoherence and misalignments tend to occur across four dimensions:

- *Learning objectives and responsibilities*. Clearly articulated learning goals are often missing. But even when they exist, the roles and responsibilities of different system actors in achieving them are unclear, resulting in limited accountability.
- *Information and metrics*. Accurate, credible information on learning is often unavailable. This can divert attention from learning and hinder monitoring and evaluation of interventions aimed at improving outcomes.

- *Finance*. Education funding is sometimes inadequate and often allocated in ways inconsistent with a goal of providing equitable opportunities for effective learning.

- *Incentives*. The motivation and incentives of system actors are often only weakly linked to student learning."

Applying these perspectives focuses attention on the following factors:

- The **objectives of stakeholders**, how these objectives are pursued, and how well these objectives are aligned on learning (as opposed to other objectives);

- The **coherence of the education system** in pursuing these objectives;

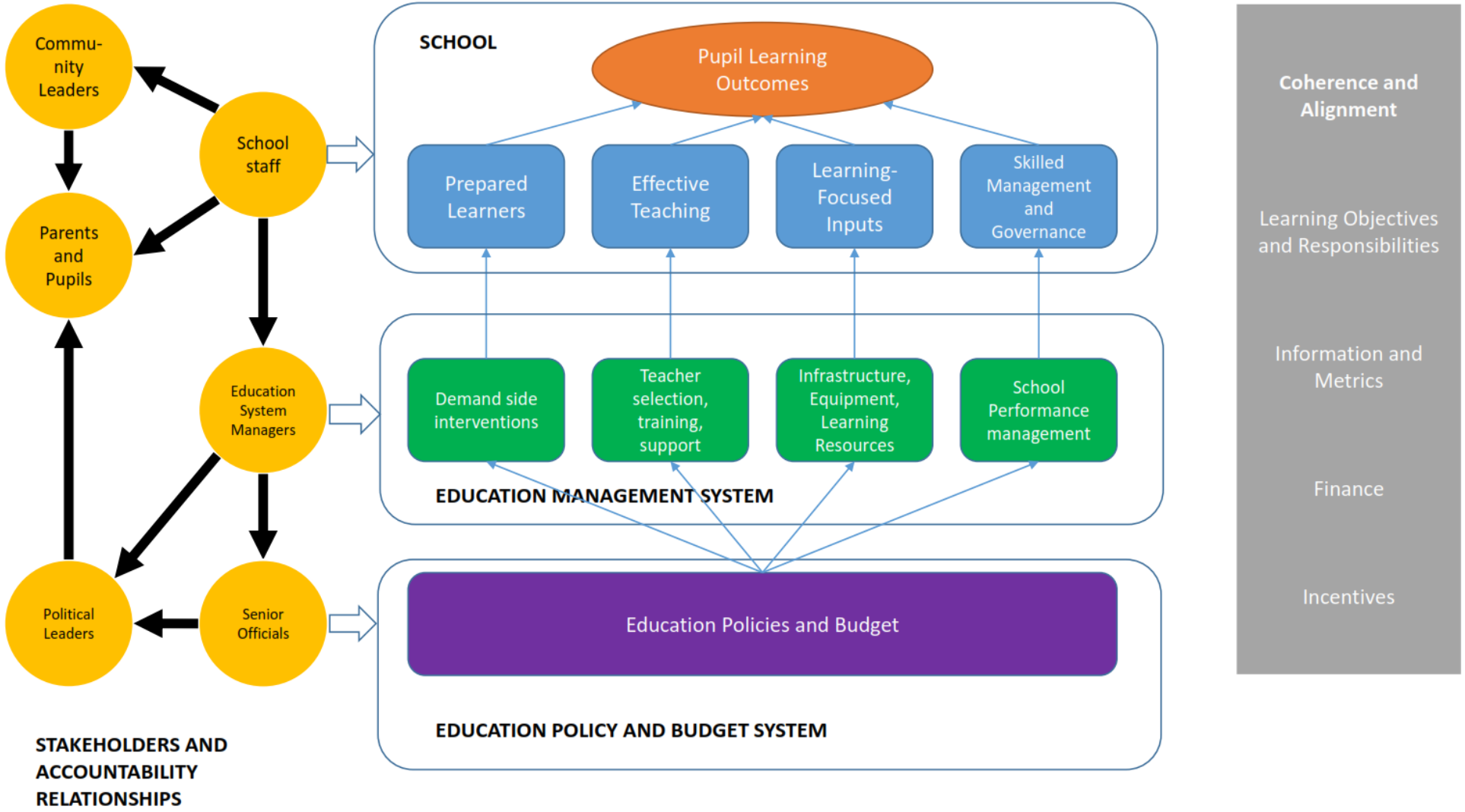
- How **accountability relationships** may influence education system performance (focusing ultimately on how this affects the school learning environment), noting the distinction between accountability through the management hierarchy (including against targets set at different levels), through professional standards, and through accountability to parents, students and the community.

Figure 2 presents the Conceptual Framework that has been derived from these insights in WDR 2018. It represents the key elements that influence how effectively an education system (in principle encompassing both private and public education providers) generates learning outcomes. The left-hand side of the diagram illustrates the accountability relationships (black arrows) that are important for effective education system performance between stakeholders at various levels (from the school and community through the education management system to the senior political level), highlighting the stakeholders with the most decisive influence over each level (white arrows). The central block of the diagram focuses on the four key school-level ingredients for learning, and the contribution of the education management system to achieving these. The right-hand block shows the dimensions across which cohesion and alignment is required for the whole system to be effectively oriented on learning outcomes.

The Conceptual Framework aims to cover all the elements above with the data analysis focusing more extensively on analysing both the **status of pupil learning** over the evaluation period as well as analysing data that relates to the '**immediate causes'** of the 'learning crisis' in Punjab. This report extends the underlying Conceptual Framework to also encompass **educational access and participation** (as measured by enrolment rates, school completion rates etc.). Whilst we recognise the value of focusing on the 'learning crisis', we also remain mindful of the fact that educational access continues to pose a challenge within the Pakistani context.

Since the Conceptual Framework has identified the four key school level ingredients for learning, the wider PESP2 evaluation approach is examining how far UK support through PESP2 has contributed to improvements in the delivery of each of these ingredients, as well as to system alignment on, and coherence around, learning objectives. This Review of Education Sector Performance therefore aims to examine how far there is data available that measures each of these elements, and what this data says about the progress that has been made in achieving learning outcomes, in improving education access and participation, and in delivering each of the four "ingredients" to schools. This report is therefore intended to identify gaps in the measurement of potentially critical factors for learning as well as to make the best possible assessment of progress.

Figure 2 Conceptual Framework for the PESP2 Evaluation



2.3 Mapping of data sources to the conceptual framework

This section of the report summarises the key findings from the Data Quality Assessment (DQA) undertaken during the Inception Phase. This is followed by a mapping of each of these data sets and the various indicators the Conceptual Framework underpinning this evaluation.

2.3.1 Summary of Data Quality Assessment

The DQA undertaken during the Inception Phase of the PESP2 Evaluation had two key purposes:

1. To scope out all available education data sets for Punjab;

2. Most importantly, to identify the **extent to which available secondary data sources can robustly and accurately identify key indicators of performance** (particularly those identified by the PESP2 Outcomes) over the evaluation period.

The DQA was envisaged as involving three main steps:

i. Initial assessment of data quality based principally on desk analysis of documentation and examination of raw data and published results;

ii. Additional analysis of the quality of data systems, focusing on sources that have been identified as most important and/or problematic during the initial assessment, and potentially involving some primary investigation;

iii. Analysis of data to provide best estimates of key indicators (taking account of the quality of different sources and attempting to explain and resolve differences between measures of the same indicator from different sources).

During the Inception Phase, the initial assessment of data quality and some additional analysis of data systems quality was undertaken. The methodology used to undertake the DQA adapted the IMF DQAF principles of data quality assessment to the specifics of education data. The DQA adopted an iterative and consultative process which included a review of DQA Frameworks, consultations with an OPM DQA expert to develop an adapted template for analysis, and a mission to Lahore to brief and train the IDEAS team and finalise the template and DQA methodology. The methodology was then applied to produce the two DQA reports, on survey (DQA I) and administrative (DQA II) data sources.

The DQA examined available survey plans and design documents to assess the following dimensions for each of the data sets listed above:

- Quality dimension 1: Integrity
- Quality dimension 2: Methodological soundness
- Quality dimension 3: Accuracy and reliability
- Quality dimension 4: Serviceability

- Quality dimension 5: Accessibility
- Quality dimension 6: Training and field work review

The DQA I report provides dashboard summaries of these assessments for each of the survey data sets.

In addition to survey data, a DQA was also carried out on administrative data sources (requiring a different assessment methodology, emphasising for instance the adequacy of audit trails).

In addition to assessing the overall quality of available data sets, the DQA has also assessed the extent to which the data sets could be used to provide robust estimates on key educational indicators. The following criteria were used for identifying specific indicators available from secondary sources:

- A close conceptual relationship between the variable of interest (as identified in the Conceptual Framework) and the indicators as available in the secondary sources;
- The availability of estimates covering Punjab with a sufficient degree of statistical confidence;
- The indicators being based on methodologies and data collection processes of sufficient quality.

Different types of data sets allow different types of indicators to be calculated. For example, different measures of school participation can be calculated based on whether information is available through administrative data or household/school survey/school census data. Attendance rates and enrolments rates both provide information about the quantity of pupils participating in the schooling system as a proportion of the size of the overall population. A key differentiating factor between enrolment and attendance ratios is that enrolment ratios tend to be calculated based on school census or survey data/administrative data that count the number of pupils officially enrolled in school in combination with demographic estimates of the school-age population. However, attendance ratios typically are gathered through household survey counts of the proportion of children that report participation in school at a given point over a particular time period.

2.3.2 Education data available

The DQA process scoped out the available data sets and formed judgements on the quality of available secondary data. The DQA I document identified and reviewed the following sources of survey data:

- The **Nielsen PSES household data set** covered nine waves of 36,000 households, on average, between November 2011 and March 2017 (with a slightly different questionnaire used in the last round).

- The **Learning and Numeracy Drive (LND) data**: monthly testing. A number of different tests and questionnaires have been used for this and it covers the period September 2015 to February 2020.[2] This is a school-based data set.

- **The DFID 6MA data**, covered the period September 2014 – March 2018. This is a school-based data set.

- **Pakistan Social and Living Standards Measurement (PSLM) Survey**, 2012-2018. This is an extensive household-level survey with very detailed information collected on household incomes, expenditures, education levels of various household members etc.

- **Annual Status of Education Report (ASER)** produced annual waves of data (with the exception of 2017) which are covered in the RESP (2012-2019). This data set collects information both from households and schools. Children are assessed on basic literacy and numeracy, and both household level information (assets, maternal education, education levels completed) and school level information is gathered (teacher qualifications, enrolments etc.).

The range of data sources available has been reduced over the course of this evaluation as the Nielsen household survey and DFID 6MA are no longer being conducted. Moreover, household surveys such as the ASER and PSLM did not collect data in 2017. Pakistan conducted a population census in 2017 which has informed subsequent sampling frameworks.

In addition to analysing raw data from these, we have also where possible used data from other published and unpublished research (without a formal assessment having been made of its quality). This includes:

- **Teaching Effectively All Children (TEACh),** ESRC/DFID funded data (ES/M005445/1); household and school-based data on rural children aged 8-12 years old from three districts in Punjab. Data are cross-sectional and available for 2016-2017 (with children in schools in Grades 3-5 assessed at the beginning and end of the school year). Extensive detailed information on teachers was also collected. Children in schools provided self-reported measures of wealth. The data from TEACh have been collected by IDEAS and the University of Cambridge and are not yet publicly available. Nevertheless, findings and published articles are reported as they help inform this evaluation in invaluable ways.

- **Multiple Indicator Cluster Survey (MICS),** conducted every three years from 2011-2017 for Punjab. This is an extensive household-level survey led by UNICEF, and maps the situation of women and children around the world. The access indicators have been calculated from the raw data in line with the analysis of DQA I data sets, while the remaining indicators discussed in this report draw on reported statistics in publicly available reports.

- **SABER Service Delivery (SD)** tool, developed by the World Bank, studies barriers to student learning outcomes in primary schools in Punjab. Data was collected for a convenience sample of six districts that is representative of North, Central and South Punjab. Data was collected on schools, children, teacher, principals and parents in 2018 to

[2] LND monthly assessment has not been carried out since the initial school closure in March 2020.

understand components of the WDR 2018. Preliminary findings from the initial data release are discussed here.

- **Punjab Examination Commission (PEC)** published reports. While it was intended to use data from PEC, it has not yet been possible to access raw data. Exam result analysis reported on the PEC website has been drawn on where possible. The analysis in this report contains the raw averages (or percentages) of various student scores disaggregated by different sub-groups without reporting on whether these differences are statistically significant. PEC also conducted a Provincial Assessment of Student Learning (PASL) 2018-2019 that links student learning with teacher competence and teaching practice, providing useful information for understanding teacher effectiveness.

The following administrative data sets were analysed:

- **Annual School Census (ASC)/ Education Management Information Systems (EMIS)** data (2012-2020). This is a mandatory, annual data collection exercise for all public schools in the Punjab, providing reliable information for policy making. This covers data on enrolment, infrastructure and facilities, teachers, and school committees in government schools. Limited provisional results from the 2020/2021 school year were made available to analyse.

- **Private Schools Census (PSC)** data (2011 and 2016). While there is no legal obligation for private schools to provide data, this exercise aims to gather data on all private schools in Punjab. The survey is a sub-set of the EMIS survey and gathers basic data on school characteristics, enrolment and staff.

2.3.3 Mapping of indicators

Error! Reference source not found. provides information on the participation and access indicators i dentified from the data sources.

Table 2 provides information on the indicators of educational attainment and learning outcomes.

Table 3 sets out the indicators that are available to measure the four school level “ingredients” contributing to learning. It is worth noting that all the sources reported are based on raw averages[3] and no sophisticated analysis has been undertaken to control for aspects such as ability or family background. To a large extent this is driven by the lack of availability of such variables to undertake robust analysis. Therefore, the findings should be treated as averages and indicative, able to present a summary picture and not able to draw out strong conclusions.

Table 1 Indicators of Education Access and Participaton

Indicator	Definition	Data set	DQA source
Education Participation			

[3] Significance levels of group-wise differences for raw averages are available for some indicators.

School participation rate	*School participation rate* can be measured as the number of population aged within a given range (i.e. 5-9 years) who report currently attending or being enrolled in school as a ratio of the total population of that age times a 100. For example, a school participation rate for children aged 5-9 years of 96% would mean that 4% of children within that age range are not in school. Participation indicator looks at broader school attendance irrespective of class levels.	Data analysed: Nielsen ASER PSLM MICS	DQA I
Student attendance/ enrolment rate	The *gross and net enrolment/attendance rate* converts the participation of the population according to education levels. The *gross enrolment/attendance rate* (GER) is the % of the population who are at school at a given level of education to the number of school age population corresponding to that level of education. GERs can even be over a 100%. GER = [the number of children in primary school/total population of primary age children]*100 The *net enrolment/attendance rate* (NER) is the % of school-age children in the group who are in school at a certain level of education in accordance with the age of the total number of children in the school age group. NER = [the number of children of primary age and in primary school/ total population of primary age children]*100 While this indicator is similar to participation, it has been calculated from a different variable in the data set – namely the class the child is enrolled in.	Data analysed: Nielsen ASER PSLM MICS EMIS PSC	DQA I
Drop-out rate	*Student drop-out rates* calculate the percentage of children of school going age who have completed the Grade 1 of primary school but who report being out of school currently. Since these surveys gather cross-sectional (and not time series) data, we use a proxy for drop-out. Children have been classified as drop-outs if they are currently out of schools but were previously in school.	Data analysed: Nielsen ASER PSLM MICS	DQA I
Transition rate	*Primary to secondary transition rate/progression to secondary school* calculates the number of children attending the first grade of secondary school who were in the last grade of primary school during the previous school year.	None identified	DQA I

Table 2 Indicators of Educational Attainment and Learning Outcomes

Indicator	Definition	Data set	DQA Source
Pupil Learning Outcomes			

Student learning outcomes	*Student learning outcomes* are typically measured in various different ways such as through international assessments, national assessment programmes (curriculum based or otherwise) and increasingly through citizen-led assessments and via smaller scale household and school surveys. They range from assessing basic literacy and numeracy to those that assess more advanced competencies.	Data analysed: LND DFID 6MA ASER Data from reports: TEACh, PEC, MICS, preliminary evidence from SABER SD	DQA I
Other indicators that proxy for 'learning'/attainment within a system			
Adult literacy rate	*Adult Literacy rate* is the percentage of people aged 15 and above who can both read and write with understanding a short simple statement about their every-day life. However, different data collection agencies/organisations or governments may use less stringent thresholds to measure this outcome. These types of indicators can typically be calculated using household survey data.	Data analysed: PSLM	DQA I
Primary completion rate	*Primary completion rate* (PCR), or gross intake ratio to the last grade of primary education, is the number of new entrants (enrolments minus repeaters) in the last grade of primary education, regardless of age, divided by the population at the entrance age for the last grade of primary education. Since information on repetition in not available in the mentioned data, PCR was approximated through the following formula: PCR = (number of children in Grade 5/ number of children aged 9)*100 Comparison of GER and NER statistics from these surveys shows that children are not in age-appropriate classrooms. In light of this the above formula does not provide useful information and has been excluded from the analysis below.	Data analysed: Nielsen PSLM ASER Nielsen	DQA I

Table 3 Indicators for Ingredients of School Level Learning

Indicator	Definition	Data set	DQA Source
Prepared Learners			
Student attendance/ enrolment rate in 'pre-primary'	Pre-primary GERs and NERs (enrolment in *katchi*/pre-primary/ECE/kindergarten etc.).	Primary data analysed: ASER MICS ACS/EMIS	DQA I DQA II

		PSC	
School readiness	*School readiness* at the primary level is the % of children in Grade 1 who have attended an early childhood programme (pre-school, *katchi*, nursery, etc.) in the previous school year.	Data from reports: MICS	
Child nutrition and health	Various measures of health and nutrition including anthropometric measurements, minimum acceptable diet and immunization.	Data from reports: MICS	
Early childhood development index	*Early childhood development index* (ECDI), tracks the development status of children (3-4 years) as a foundation to future learning and well-being. Children are assessed on literacy-numeracy, physical, socio-emotional and learning domains. The ECDI is the % of children who are on track within at least three of the mentioned domains.	Data from reports: MICS Preliminary evidence from SABER [literacy-numeracy only]	
Support for learning at home and in school	Various measures of learning materials at home (books), child involvement in early stimulation and response activities with household adult member, and parental involvement of learning in the school.	Data from reports: MICS	
Pupil attendance rates	Headcount report of children present in school (compared to enrolments) on day of visit.	Primary data analysed: ASER	DQA I
Effective Teaching			
Teacher qualifications, attendance and experience	Various measures of key inputs into a child's schooling experience (with teachers being the most critical one)	Data analysed: ASER ASC/EMIS	DQA I DQA II
Teacher competence, types of training received, teaching practice	Teacher competence measured by assessing teachers' ability to spot pupil mistakes and content knowledge of material they teach; Content of training received assessed by asking whether they received training on specific elements (teaching diverse pupils, multi-grade and multi-lingual settings etc.); Teaching practice is assessed through classroom culture along with use of instructional methods and socio-emotional skills through classroom observation.	Data from reports: Preliminary evidence from TEACh and SABER SD PEC PASL	
Learning Focused Inputs			

Availability of inputs such as electricity, boundary walls, functional toilets etc.	Various measures of physical school inputs as identified in surveys (% of available facilities, students per facility).	Data analysed: ASER ASC/EMIS PSC	DQA I DQA II
Skilled Management and Governance			
School management committee	Various measures including school management committee (SMC) number of members and annual meetings, and NSB spending. However, these do not provide enough information with regards to governance in the functioning.	Data analysed: ASC/EMIS	DQA II
Head teacher training, autonomy and knowledge	Head teacher training though pre-/in-service training on specific elements (school administration, instructional leadership, finance/HR management, etc.…); head teacher autonomy through school level decision making; head teacher knowledge assessed through understanding of school infrastructure, school knowledge and teacher ability.	Data from reports: School leadership study and preliminary evidence from SABER SD	

3 Evidence on Educational Access and Participation

3.1 Introduction and overview

This section of the report presents a detailed summary of the evidence based on extensive analysis of data sets mainly in the Punjab (with some evidence on variations in key statistics by province/region). Across the available data sets, the analysis broadly covers the period 2011-2019. This section reports on the evidence on educational access in the Punjab and key strengths and weaknesses of the data underlying this analysis. The analysis in this section is based on PSLM, Nielsen, ASER and MICS data, along with EMIS and PSC. Using these data sets, we have been able to calculate various indicators for access – education participation rates, gross enrolment ratios (GER) and net enrolment ratios (NER) for various age groups, for male and female children, and by socio-economic status (SES) and by location, where possible.

The analysis of access indicators has shown that more and more children in the Punjab are attending school – participation rates have been growing over the period illustrating the fact that across the board children aged 5-16 years are more likely to be attending school. Enrolment rates, however, highlight that this is still work in progress. While more children are enrolled in school, many are not in the appropriate grade for their age band and this is driving the difference we observe in participation rates increasing without corresponding improvements in GERs/NERs. There are also differences in educational access by region (with children in rural areas accessing education far less than their urban counterparts) and for girls (with girls often less likely to participate in schooling than boys). These gaps are significantly different. Wealth is also a critical factor with the rich far more, and significantly, likely to be accessing schooling than the poorest in the province. The analysis of richer data, albeit from only three districts of the Punjab, also reveals that disability can be a deterrent to accessing schooling especially for the poor and for girls. The province has also been more successful in getting the poorest children into schools but not always successful in ensuring they enter the grades appropriate for their age and not always successful in ensuring they remain in the schooling system for the duration.

However, there are clear limitations of the analysis. The different access indicators – participation rates and GER/NER – are snapshots at a point in time and can have differing values depending on how they are calculated. Therefore, they need to be interpreted with caution. For example, a GER can exceed 100% due to the inclusion of over-aged and under-aged students either because of early or late entrants or due to grade repetition. A more rigorous evaluation needs additional information to assess the extent of repetition and late entry into schooling as this is likely to allow for more accurate measures of access to schooling, as suggested by UNESCO UIS[4]. Participation rates are very simple measures of self-reported attendance in school and do not account for the level of education or any given school age band. They report the percentage who report participating in school, regardless of grade and this measure could be calculated for any age group and not for the official school-age population corresponding to the same level of education (e.g. for GERs). Therefore, there could be vast differences in access estimates when measured using participation. There are also differences in the underlying measures of SES. Some data sets simply do not collect suitable measures whilst others are too simplistic.

[4] http://uis.unesco.org/en/glossary-term/gross-enrolment-ratio

Therefore, a more accurate investigation would be useful to evaluate programme effectiveness to understand whether differences in enrolment are being driven by drop-out or grade repetition. It is also important to understand the **profile of the children who are participating** more in schooling; it could be that the greater participation reflects entry by the more marginalised but once in school, it becomes even more important to ensure they receive quality learning to attain skills required for smooth progression through schooling rather than drop-out. Hence, whilst participation rates have improved, the GERs and NERs do not reflect a corresponding improvement – the system is able to get more children into school but not necessarily able to do so at the correct age/grade and not always able to retain them once they are in school. In order to identify who is enrolling in school, and to truly measure programme effectiveness, data would typically be needed on whether a child is enrolled in school or not, whether they repeat a grade or not, information on SES and other key background indicators as well as information on whether children are retained which allow an evaluator to identify who is enrolling in school and whether they complete a given level of schooling or not.

3.2 Data sources and quality

3.2.1 Overview

According to the DQA I documents, amongst the survey data sets reviewed, all the household survey data sets (Nielsen, ASER and PSLM) can generate education participation indicators. Of these, ASER and PSLM collect data for the duration of the PESP2 programme (2012 onwards). And, only ASER collects data from schools as well with the potential to link individual children to the schools they attend. The Nielsen data set covers 4-16 year olds, ASER covers 3-16 year olds whereas PSLM collects information on all those aged 4 and above on whom necessary indicators can be generated. The MICS data set, which has been included in the recent revision to this study, covers 3-24 year olds. An important factor in examining educational participation in Pakistan is that in relation to the type of school that a child attends. These categories can include not just government schooling but also various types of non-state schools (including private fee-charging schools that charge low fees or elite institutions) or even *madrassas* which may or may not just be providing religious education. All data sets allow for disaggregation of computed indicators by school type. However, only the PSLM specifically distinguishes between madrassa's that provide purely religious education as opposed to those that provide more general schooling as well. This distinction is important in the calculation of school participation as children who attend madrassa's imparting purely religious education may be counted as participating in schooling when in reality they are not necessarily acquiring a broader education. Because the data sets are collecting data from households, we are essentially relying on the respondent giving true and accurate information on the child's participation status. Only ASER data is also collected from schools (and has the potential to link it to some children within households) and captures a broader definition of 'attendance' by measuring children in school on the day of the enumerator visit.

According to DQA II documents, student enrolment can also be calculated from administrative data. The ACS/EMIS, however, does not record enrolment information by age consistently (2012-2015 have enrolment information by age). Similarly, the PSC only contains enrolment information by class level. With limited secondary variables, these data sets provide enrolment share by type of provider.

3.2.2 Pakistan Social and Living Standards Measurement

The PSLM data set data set follows the World Bank Living Standards Measurement Surveys principles to collect a rich array of data on a wide range of topics. The data are timely, regular and representative at several levels. The education module contains detailed information on whether an individual is 'literate' or not (10 years and older), whether a child is enrolled in school or not and if so, the type of school, grade attended currently, and the amount of expenditure on enrolled children on specific items (such as fees, uniform etc.) for children aged 4 and above (aged 3 and above for PSLM 2018/2019). It is possible to disaggregate this data at various levels – by age, gender, SES, rural-urban location etc. The samples are large and collected using stringent methodologies. The data set contains income-related questions and when conducted in conjunction with the Household Integrated Economic Survey (HIES), also collected expenditure information. Depending on data availability, income or expenditure is used to provide a decent proxy for socio-economic status (for more information see Annex K). This latter information allows for robust quintile calculations. This data set is particularly amenable to the calculation of representative access indicators and because it collects information from across various regions in Pakistan, it is also possible to use the data set to make cross-regional comparisons on key access indicators. A key limitation of the data set is that it does not allow for the more nuanced analysis required in this report – it does not report on disability status, learning outcomes or teacher effectiveness.

3.2.3 Annual Status of the Education Report

There are several key strengths of the ASER data set. Data on key educational outcomes are collected from across all districts in rural Pakistan and some urban locations in specific years as well. Data have been collected annually for all districts in Pakistan since 2012 (with the exception of 2017 when no data was collected). An additional key strength of this data set is the very large sample size on which outcomes data are available (in Punjab alone, the survey has sampled approximately 59,000 children aged 3-16 years in any given year from 2012 onwards). The data on educational outcomes can be disaggregated by location, by province, district, by gender and age, and also by a proxy of SES (and disability from 2015-2018). There is also information available on the type of school a child attends, if they are enrolled. Over the years, the ASER data team collect information on different types of variables of interest in addition to the usual ones which are consistently measured (for example, disability was introduced in one wave, access to mobile phones in another). The disability questions underlying the ASER data set were developed in collaboration with experts at Cambridge University and, therefore, provide a more robust assessment of disability as compared to simple 'yes/no' questions. A crucial advantage of the ASER data is the frequency and timeliness (available every year regularly since 2012 on all districts across Pakistan) and the public availability of the raw data. The data set is also well-reported and disseminated. The fact that data are also collected on schools with identifiers that allow the data to be linked to some pupils within households allows for richer analysis on a sub-set of children's outcomes should this be needed. EMIS codes are also available in the raw data through requests and therefore this allows for linking the ASER data with EMIS data for richer school-level analysis.

However, there are some key limitations of this data set. For example, the data are typically collected using volunteers rather than career or qualified enumerators. Though they are provided training, the use of volunteers could undermine the quality of data collected. As with other survey data sets collected from household members, there is a risk of respondent measurement error or respondent bias. There are also limitations to the learning assessments tools. The calculation of enrolment ratios

is also constrained by the fact that data are only collected on individuals aged 3-16 years. This excludes over-age school-goers and this reduces the comparability of GERs as calculated using ASER with those calculated using PSLM for example. The data collected on assets used to create a wealth index and for the quintiles for income-related analysis is also limited.

3.2.4 Nielsen Survey

The Nielsen household data collection initiative collected data on individuals aged 4-16 years (and further information for other household members outside this age range) across all 36 districts in Punjab from 2011 to 2017. This resulted in a large individual-based data set that can be disaggregated by several key dimensions such as location, gender, age etc. A key feature of this data set is the availability of additional information on SES and disability (latest waves). It should though be noted that socio-economic information can only be roughly proxied based on the instruments used and is excluded from the analysis below. The fact that it is a household data set has the advantage of allowing capturing information relating to out-of-school children and children who attend different schooling types (private or *madrassah* schools for example). However, who within the household provides the information to the enumerator can affect the integrity of the data collected due to the higher risk of respondent bias and measurement error. The education data collected covers a wide array of aspects (albeit only for individuals aged 4-16 years) and allows for some relevant education indicators to be calculated as shown above. It should also be noted that the data is not necessarily representative at the district, province and national levels. Moreover, the restricted age range on which education data were collected also faces the constraints that were noted for the ASER data set above in the calculation, in particular, of GERs and other comparable estimates.

3.2.5 Multiple Indicator Cluster Survey

The MICS is part of a global exercise to measure the well-being of women and children by UNICEF and provides data against key indicators of the Millennium Development Goals and Sustainable Development Goals. Data is collected every three years and is available for 2011, 2014 and 2017 for Punjab. The education module records data for household members aged 3-24 years (a larger age bracket than ASER and Nielsen) on current and previous schooling, grade, type of school, and tuition support. Hence, participation and enrolment indicators can be disaggregated by age, gender, school type and location. Detailed information is collected on household assets which is more rigorous that the data sets mentioned above and serves as a proxy for SES. The data set provides internationally comparable data that is representative at the district and provincial level. The latest round of the MICS also gathers data on disability, school readiness and learning outcomes, providing more nuanced information.

3.2.6 Education Management Information System and Private School Census

The ASC/EMIS collects data on all public schools in Punjab, annually. As the government's key school monitoring mechanism, this provides reliable information on public school performance. Number of enrolled student is available from *katchi* to Grade 12, by gender. However, enrolment information by child's age, which is necessary to calculate the participation rate and NER, is only available in the raw data from 2012 to 2015. Enrolment is recorded as per school records, regardless of attendance.

In order to calculate access indicators, the information on enrolment from the ASC/EMIS needs to be supplemented by population estimates. Given that census data on Pakistan is not publicly available, we relied on population estimates from the United Nations, Department of Economic and Social Affairs, Population Division[5]. Due to data availability by set age brackets, age brackets at the middle (10-14 years) and secondary level (15-19 years) are not comparable to our estimates from household survey data. The primary age bracket of 5-9 years matches with the household analysis.

While provisional data from 2020 has been made available to analyse, there are issues of comparability over time with this round. The data shared only includes schools under the School Education Department (SED), excluding public private partnership schools that are represented in previous EMIS rounds. Moreover, this round collected information on student's registration number (B-form) in an effort to reduce data duplication issues. Hence, the 2020 data cannot be compared to previous rounds.

The PSC provides data on private schools in Punjab in 2011 and 2016 through a survey less comprehensive than the ACS/EMIS. Enrolment numbers by gender are available from nursery/playground to Grade 12/A levels. Since student enrolment is only recorded by grade, and not age, participation and NER cannot be calculated from this data set. While the PSC aimed to expand the government's monitoring mechanism to the private sector, this exercise has not been consistently administered over time. The main limitation of this data set is its lack of legal binding which throws into question the extent of the response and coverage error. Unregistered private schools, for instance, are probably less willing to share such information.

3.2.7 Comparing sources

The different 'access' indicators are calculated in varying ways and are, therefore, not entirely comparable. Moreover, it is worth noting that a large share of the ASER data is rural in nature which creates comparability issues as the PSLM data, for example, cover both rural and urban samples. The Nielsen, ASER and MICS data sets only collect education information from a select age category (e.g. 3-16 year old children in the ASER data) whilst the PSLM data collect education information on a wide age band for 4 years and above. This means that the GERs calculated are not directly comparable across the different data sets, particularly at the secondary level. Similarly, the statistics calculated from the administrative data sets depend on the availability and reliability of population estimates disaggregated by age. It is also worth noting that the data sets cover different periods in time which also limits their comparability. When disaggregating by 'school type', all data sets pose challenges in the way they disaggregate school types. Broadly speaking, all data sets face the limitation relating to the very loose definitions of 'school type'. For example, 'private' schools is used an all-encompassing term in the ASER data and in the Nielsen data and no further distinctions can be made regarding the exact type of school.

3.2.8 Treatment of disability

Disability analysis is limited by the lack of reliable estimates on children with special education needs and disability (SEND) in Punjab, with large variances by methodology and definition (OPM, 2020b). Since there are important differences in the ways that the different data sets identify the incidence

[5] https://esa.un.org/unpd/wpp/DataQuery/. Population estimates were downloaded in April 2020. These estimates are based on limited national population censuses conducted in Pakistan (https://population.un.org/wpp/DataSources/586)

of disability status within the Punjab, reported prevalence also differs. The classification of disability by the Special Education Department includes five categories – visually impaired, hearing impaired, physically handicapped, mentally challenged, slow learners – divided into mild, moderate, severe and profound. There is a need to expand this classification and take into account learning difficulties (SEP, 2019). Although recent survey sources have improved, data on the numbers and profile of children with cognitive and learning disabilities has not been systematically collected[6] (OPM, 2020b).

At best, most data sets are only able to capture information on this aspect using the question: 'what is the nature of (name's) disability?', and give coded options on whether the disability is related to vision, hearing, speech etc. The Nielsen data set collected information on disability using this approach (Wave 6 to Wave 8). The questionnaire also asks about children who are either attending a special school or not attending school due to a deformity or disability as reported by the respondent. The respondent is further probed on the nature of this disability (coded as a vision impairment, speech impairment, hearing impairment, physical impairment or 'other' with further probes for the latter category). Because of the way the question is asked, for the purposes of the analysis in this report, all individuals coding responses 1-5 in this sub-section are classified 'disabled' and those not answering this question are coded as 'not disabled'. Rose et al. (2018) argue that this way of collecting information on disability provides very inaccurate estimates of disability and does not reflect the diversity in severity and types of disabilities and is also likely to result in 'high underreporting as labelling individuals as disabled in questions could be stigmatising in many societies'.

In the latest Wave 9, conducted in March 2017, the survey introduces an extensive child health and functioning module similar to ASER, limiting comparability with previous rounds. A child is categorized as having disability only if they are not able to complete tasks in at least one of the following categories: seeing, hearing, walking, self-care, being understood, learning, remembering, behaviour, focus, accepting change and making friends on a four point scale (Table 4). No, some or a lot of difficulty is categorized as having no disability.

The MICS, ASER and TEACh data sets, on the other hand, have attempted to collect information on disability using the more progressive Washington Group on Disability Statistics, established under the United Nations Statistical Commission to "address the urgent need for cross-nationally comparable population based measures of disability."[7] (Rose et al. 2018). These questions provide a more sensitive and nuanced approach to capturing disability incidence and various versions of these underpin the data collected under these surveys. Whilst the ASER surveys use the Washington Group set of Short Questions supplemented with questions that ask about the child's ability to understand and remember things, TEACh and MICS use the full set of questions listed in the 'Child Functioning' modules for children aged 5-17 years (Ibid). More specifically, the health functioning sheet of the ASER survey gathers child data on seeing, hearing, walking, self-care, understanding and remembering on a four point scale. The child functioning module of the MICS survey gathers data on a more detailed list – seeing, hearing, walking, self-care, communication, learning, remembering, concentrating, accepting change, controlling behaviour, making friends, anxiety and depression. For the purposes of analysis in this report, a child is categorised as having a no, 'mild to moderate' or 'severe' disability as shown in **Error! Reference source not found.**. This

[6] The 2020 ASC/EMIS survey contains a field on 'Mild disability – yes/no' when recording information by student. It is unclear whether this information has been collected.
[7] Washington Group on Disability Statistics, details available at: http://www.washingtongroup-disability.com/

is in line with administrative responsibilities where the Special Education Department is responsible for children with severe and profound disability, while the School Education Department (Inclusive Education) is responsible for integrating children with mild to moderate disabilities (SEP 2019).

Table 4 Disability categories (ASER & MICS)

Data Analysis Categories	Categories
No disability	1 – no difficulty
Mild to moderate disability	2 – some difficulty
	3 – a lot of difficulty
Severe disability	4 – cannot do X at all

Using a more nuanced set of questions (the 'Child Functioning' module), TEACh data reports a significantly larger incidence of disability than previously reported using other data sets (11% for 8-12 year olds as opposed to under 1% using ASER data on the same sample of districts and for 8-12 year olds only in 2015). In MICS 2017 which also uses the 'Child Functioning' module, 6.3% and 59.5% of 5-17 year olds report 'severe' and 'mild to moderate' disability, respectively, out of the children that were assessed. In general, the sample of disability is very small in ASER. Only 0.4% (or 188 children), 0.6% (or 356 children) and 0.4% (or 206 children) of children 3-16 years report 'severe' disability in 2015, 2016 and 2018, respectively. Similarly, around 4.6% (or 2,282 children), 2.6% (or 1,500 children) and 2.4% (or 1,335 children) report 'mild to moderate' disability in 2015, 2016 and 2018, respectively. Calculating percentages within this small group will be misleading and does not provide an adequate comparison. In 2018, ASER piloted the 'Child Functioning' module on a sample of five districts in Punjab and Sindh, finding that 22.2% have 'moderate' or 'severe' disability in at least one of the reported functions (ITA, 2019).

3.3 Commentary on trends

This section analyses trends based on the outcome indicators listed in Table 1. The analysis is restricted to individuals aged 5-16 years, with age disaggregation for 5-9, 10-12 and 13-16 years to align with the age groups reported in the Academy of Educational Planning and Management (AEPAM) report. The AEPAM cut-offs are used by the Ministry of Federal Education & Professional Training by combining the EMIS data sets and publishing national education statistics. Additional disaggregations are reported by gender (male versus female), by location (rural versus urban), by wealth quintiles (1=poorest and 5=richest) and by disability, where possible. Annex K reports how wealth quintiles have been computed in the various data sets. We also report province-wise[8] analysis in some instances to compare the educational status in the Punjab with other provinces during the evaluation period.

[8] The FATA region was merged with the province of Khyber Pakhtunkhwa in May 2018. The latest round of ASER data has separated coded for districts of Khyber Pakhtunkhwa and newly merge FATA region. On the other hand, the latest round of PSLM includes the FATA analysis as part of Khyber Pakhtunkhwa.

3.3.1 Overview of participation rates

Participation rates in the Punjab have improved indicating that more children are attending school but further efforts are needed to ensure that they access education at the appropriate grade for their age

Table 5 illustrates the improvements that Punjab has witnessed in educational access when measured through 'participation' rates (calculated for a given age band, regardless of grade in which the child might be enrolled). It is clear from Table 5 that the province has made strides in *getting children aged 5-16 years into school*. Some data sets report more success than others (ASER as compared to others).

These overall improvements mask differences across groups. In particular, the province has succeeded in getting more children aged 13-16 years into school according to Nielsen and ASER, and more children aged 5-9 years into school according to PSLM and MICS. The 13-16 age group still lags behind participation among children of primary age, 5-9 years, and middle age, 10-12 years (this is statistically significant in all data sets). There has also been greater success in enrolling male children as compared to female children, this being a consistent story across the different data sets (i.e. participation rates for boys are consistently higher). These differences are statistically significant. It is clear from the different data sets that there has been progress in girls' participation in the province (more percentage point improvements over time) but it is equally clear that this progress is persistently slow and universal access remains far from being achieved. Boys' participation in schooling is better than girls' but again far from universal. There are also clear differences within Punjab by location with rural areas' faring worse than urban areas with estimates of the difference in participation ranging from 11.2 percentage points (PSLM 2018/2019) to 9.1, 5.4 and 9.4 percentage points (in Nielsen March 2017, ASER 2019, and MICS 2017, respectively). While there have been improvements in participation in rural areas, there is a statistically significant difference by school location. Table 5 shows that whilst the province has shown some improvements, there are significant challenges remaining if they are to achieve universal access to basic education, particularly for some groups and regions.

GERs and NERs provide alternative means of evaluating access to education at various education levels. Table 6 presents GERs at the primary education level and Table 7 depicts NERs at the primary level calculated using various data sets over the evaluation period. As mentioned in Table 1 above, GERs calculate the percentage of the population within the age-band appropriate to a set of grade levels who are at school within one of these grades. NERs calculate the percentage of school-age children in the age-group who are in school at an age-appropriate grade level. Due to the way the ratios are calculated, it is possible (and common) for GERs to exceed 100 (as over-age and under-age children are included in the calculation). In particular, the NER is considered to be a measure of the education coverage at a specific level in a country's education system. By excluding over-age and under-age students, the NER more accurately captures the coverage and internal efficiency of the education system as compared to GER. Nevertheless, it is useful to see the differences between net and gross ratios to identify system inefficiencies. Sharp discrepancies between GERs and NERs, and between participation rates and NERs, indicate that children enrolled in a given level of education are either entering late to first grade or not progressing regularly through the grades and that there are system inefficiencies that could be improved through adopting

appropriate policies and measures to address grade repetition, drop-out or retention-related bottlenecks in the education system[9].

Table 5 Participation rates (5-16 years), by age, gender and location (%)

Data set	Overall (5-16 years)	Age Group (years)			Gender		Location	
		5-9	10-12	13-16	Female	Male	Rural	Urban
PSLM								
2012/13	74.6	79.2	81.0	62.7	70.9	78.2	70.6	84.2
2013/14	73.2	78.7	79.6	60.4	68.3	78.0	68.6	83.6
2014/15	74.6	79.7	81.3	61.8	71.1	77.9	69.6	86.0
2015/16	73.8	79.6	81.2	59.5	69.2	78.3	69.1	84.5
2018/19	79.1	85.0	84.7	65.5	76.7	81.4	75.2	86.4
Nielsen								
Nov. 2011	78.6	84.1	84.0	64.7	75.0	81.9	76.0	87.1
Jun. 2012	80.8	85.4	85.0	69.9	77.9	83.5	78.4	88.8
Nov. 2012	80.7	85.5	84.6	68.8	77.9	83.4	78.2	89.0
Jun. 2013	80.2	84.4	84.0	69.9	77.1	83.1	77.6	88.7
Nov. 2013	83.0	87.6	86.2	71.6	80.6	85.1	80.9	89.5
Nov. 2014	85.0	89.4	88.3	74.5	83.0	86.9	83.2	90.6
Jun. 2015	85.8	90.2	88.8	75.8	83.8	87.7	84.2	91.0
Dec. 2015	86.6	90.4	89.7	77.0	84.9	88.2	85.0	91.5
Mar. 2017	85.5	90.5	88.3	75.1	83.6	87.2	82.3	91.4
ASER								
2012	83.7	87.6	87.0	73.3	80.1	86.4	83.5	91.2
2013	84.6	88.8	87.0	74.8	81.9	86.7	84.1	93.3
2014	85.8	89.4	88.6	76.9	83.4	87.6	85.0	91.6
2015	85.0	89.2	87.5	75.2	82.2	87.2	84.3	91.3
2016	85.8	89.2	89.5	75.6	83.4	87.7		
2018	88.8	92.0	91.0	80.4	87.5	89.9		
2019	92.0	94.2	94.3	85.4	91.2	92.8	91.0	96.4
MICS								
2011	71.9	77.0	77.8	59.8	68.0	75.5	68.0	82.3
2014	73.9	80.1	78.9	60.8	70.9	76.7	69.4	83.9
2017/18	78.6	85.3	82.8	64.6	76.5	80.7	75.4	84.8

Note: Differences in the participation rate by gender and location are significant at the 99% confidence level or above. In terms of age groups, the differences between primary (5-9 years) and secondary (13-16 years) age, as well as the difference between middle (10-12 years) and secondary (13-16 years) age, is significant at the 99.9% confidence level. More detail about the significance levels can be found in the data set specific annexure.

[9] http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/education/net_enrolment.pdf

Table 6 and Table 7 report a lack of improvement – data sets consistently (albeit to different extents) report *declines* (or no improvement) in GERs and NERs for children in primary grades (1-5) during the evaluation period. This suggests that even in terms of access, the last few years have not shown remarkable improvements in primary enrolment levels across the province. Similar findings are noted when the data are cut by gender and by location. The exception to this is rural data from ASER which shows small increases in primary GER and NER, driven by improvements in girls' enrolment. There are also sharp discrepancies between GERs and NERs as calculated using the various data sets and, as mentioned above, these hint at system wide inefficiencies relating to over-age school entry, grade repetition, drop-outs or other bottlenecks within the system that need addressing through appropriate policies and measures.

Table 6 Primary (Grades 1-5) GER (%), by gender and location

Data set	**Overall** (Grades 1-5)	Gender		Location	
		Male	Female	Rural	Urban
PSLM					
2012/13	98.2	102.1	94.0	94.3	108.3
2013/14	100.1	105.5	94.3	96.0	109.9
2014/15	96.7	101.4	91.7	91.7	109.2
2015/16	93.2	98.7	87.6	88.5	104.9
2018/19	94.8	97.6	91.9	91.3	101.8
Nielsen					
Nov. 2011	104.5	108.9	99.7	102.4	111.9
Jun. 2012	98.1	101.2	94.7	96.6	103.7
Nov. 2012	101.3	105.4	96.9	98.4	111.6
Jun. 2013	89.0	92.6	85.0	86.6	97.4
Nov. 2013	86.9	89.5	84.0	84.8	94.1
Nov. 2014	81.5	84.2	78.7	80.8	83.7
Jun. 2015	99.9	102.5	97.0	98.7	103.8
Dec. 2015	99.3	101.4	97.0	98.1	103.4
Mar. 2017	102.2	104.1	100.0	100.3	105.8
ASER					
2012	106.1	111.2	99.8	105.8	116.6
2013	106.3	110.3	101.4	106.1	109.3
2014	110.8	115.6	105.1	110.2	114.9
2015	111.2	114.1	107.4	110.9	113.6
2016	106.2	109.7	102.0		
2018	109.0	111.0	106.6		
2019	111.1	111.8	110.3	109.3	119.1
MICS					
2011	89.2	93.6	84.4	85.8	99.0
2014	86.4	90.0	82.7	82.5	95.9
2017/18	90.1	93.3	86.8	87.5	95.3

Table 7 Primary (Grade 1-5) NER (%), by gender and location

Data set	Overall (Grade 1-5 & 5-9 years)	Gender		Location	
		Male	Female	Rural	Urban
PSLM					
2012/13	62.3	64.0	60.5	59.4	69.8
2013/14	64.3	65.8	62.7	61.4	71.6
2014/15	61.1	62.9	59.2	57.3	70.4
2015/16	58.8	59.6	57.9	55.1	67.7
2018/19	59.6	59.2	60.0	56.8	65.2
Nielsen					
Nov. 2011	65.1	66.8	63.3	64.4	67.7
Jun. 2012	60.9	61.6	60.0	60.1	63.6
Nov. 2012	57.6	58.6	56.5	57.0	60.0
Jun. 2013	54.9	55.8	53.8	53.2	60.9
Nov. 2013	50.5	50.5	50.5	49.1	55.3
Nov. 2014	49.0	49.4	48.6	48.7	50.0
Jun. 2015	63.9	64.6	63.2	62.9	67.4
Dec. 2015	59.8	59.8	59.8	59.4	61.1
Mar. 2017	61.9	61.7	62.2	60.8	64.1
ASER					
2012	71.9	73.7	69.7	71.8	76.6
2013	70.6	72.0	68.8	70.7	68.0
2014	72.9	74.4	71.2	72.2	78.4
2015	72.4	73.8	70.7	72.5	71.5
2016	73.0	73.5	72.5		
2018	73.1	74.0	72.0		
2019	75.7	76.2	75.1	74.2	82.0
MICS					
2011	53.7	54.9	52.4	50.6	62.5
2014	53.0	53.5	52.5	49.3	61.7
2017/2018	53.4	53.2	53.5	51.4	57.2

3.3.2 Influence of socio-economic factors on participation

Lower wealth and socio-economic status remain associated with poorer access to schooling

Despite good intentions and progress to date, Punjab appears to be a long way away from ensuring that all children, adolescents and youth are enrolled in school. There are numerous barriers that either prevent children from accessing school in the first place or which contribute significantly to attrition from school. Article 25A of Pakistan's Constitution has stated that '**The state shall provide free and compulsory education to all children'** and by this token, cost should not be a barrier to

a child's education in the country. However, despite free primary education, cost remains a major barrier to many children's education in the country. The cost of schooling includes not just the 'direct' fee costs of acquiring an education but also 'indirect costs' including cost of uniform, textbooks and learning materials, examination fees, travel costs and other expenses. The 'opportunity cost' of lost earnings from a child attending school are also critical costs to consider when sending a child to school. Combined, these costs still constitute a constraining factor, particularly as 40% of people in Punjab (UNDP, 2016) are deemed to live below the poverty line and the province has been called the 'most unequal' in the country by the World Bank (2017). Low household SES is also likely to further exacerbate gender disparities as some parents perceive girls' education as being of less value than that of boys so prioritise the latter when finances are not sufficient to educate both.

Table 8 illustrates well that households' SES, when measured using wealth quintiles (with quintile 1 depicting the poorest, and 5 the richest), is a critical determinant of educational access in the province, with the poor participating in schooling less than the rich. The various indicators reported using PSLM, ASER and MICS data unilaterally point to the fact that education access is largely determined by household wealth – poor children are much less likely to be enrolled in school, at the primary level, substantially less so at the secondary education level, and are much more likely to drop-out as compared to their wealthier counterparts. For example, according to MICS 2017 data, amongst the poorest quintile only 58.3% of all children aged 5-16 years report being enrolled in school as compared to almost 92.8% of the richest, a gap of almost 34.5 percentage points which is highly statistically significant (Table 8). Secondary enrolment ratios (Table 10) also provide an important indicator in that graduates from the secondary level emerge more well equipped with skills that are needed for the labour market and to be able to enter into higher education levels (to enter skilled jobs such as teachers, medics etc.). Not only are far fewer children transitioning to this level of education but access to this level of education is highly differentiated by socio-economic status with a much smaller proportion of the poorest wealth quintile accessing secondary education as compared to their richest counterparts.

It is also clear that there have been great strides in getting some of the poorest children into Punjab's schools with PSLM, ASER and MICS data indicating improvements in education participation for the poorest quintile (Table 8). But these achievements are not as visible in NERs - suggesting that age and grade appropriate entry for these individuals has not met with the same success during the period (Table 11). ASER and MICS data does indicate some positive trends in NERs for the *poorest* quintiles during the evaluation period (Table 11). It seems, therefore, that **Punjab has been successful in getting more of the poorest children in school but not always at the age and grade appropriate levels**. One explanation for this could be because whilst the poorest children enter school, the schooling system is unable to retain them successfully. Table 12 shows that the poorer children are much more likely to drop-out of school as compared to their richer counterparts.

Table 8 Participation rates (%) by wealth quintile, ages 5-16 years

Data set	PSLM					ASER							MICS		
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	66.7	53.6	66.1	56.9	68.8	63.8	58.4	63.9	66.1	72.7	79.8	81.4	45.6	47.4	58.3
2	70.0	71.9	68.9	71.5	71.6	75.4	71.9	77.2	76.6	82.8	84.7	88.1	67.4	70.6	77.1
3	73.7	82.4	73.0	80.0	80.4	78.9	80.1	78.6	82.1	88.8	86.0	89.9	79.0	81.0	84.6
4	78.5	85.9	76.6	88.9	83.7	87.1	86.5	86.4	86.7	87.2	89.9	92.4	84.4	87.2	88.5
5 (rich)	85.5	85.1	83.8	94.3	88.4	91.3	91.9	92.9	90.0	91.2	92.8	95.4	91.3	92.2	92.8

Note: Differences in the participation rate by wealth quintiles are significant at the 99% confidence level or above for most of the group-wise comparisons. More detail about the significance levels can be found in the data set specific annexure.

Table 9 Primary GER (%) by wealth status/expenditure quintiles

Data set	PSLM					ASER							MICS		
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	85.8	88.4	83.7	84.1	82.4	82.6	73.3	83.3	91.1	93.5	99.0	100.7	60.0	57.5	68.7
2	94.7	100.9	92.9	88.7	90.8	98.8	94.8	103.9	103.3	105.0	107.9	107.0	90.1	89.4	95.5
3	102.2	104.2	96.1	99.4	100.5	102.3	105.5	107.5	106.1	111.4	106.6	109.8	102.0	100.3	98.9
4	107.0	96.9	101.1	100.9	102.2	111.8	110.2	116.2	114.7	107.6	108.8	112.5	105.0	100.1	101.4
5 (rich)	107.5	105.8	108.8	106.2	102.7	113.0	111.2	115.0	116.2	108.6	112.7	115.4	101.3	96.9	94.4

Table 10 Secondary GER (%) by wealth status/expenditure quintiles

Data set	PSLM					ASER							MICS		
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	33.7	19.2	34.5	18.3	35.8	12.2	14.1	15.7	13.7	18.1	17.1	24.0	12.3	14.3	14.5
2	36.2	41.7	32.4	39.3	32.1	20.7	21.4	22.8	22.0	27.0	23.7	34.4	28.5	34.1	37.0
3	42.8	64.6	39.8	54.2	46.2	24.2	27.9	26.0	28.5	35.3	28.4	36.7	46.0	52.4	57.1
4	57.5	83.8	49.4	75.6	61.5	34.5	35.2	33.5	34.5	36.3	35.7	38.3	62.9	70.0	73.9
5 (rich)	82.1	64.9	72.4	115.8	91.4	39.6	44.4	44.5	38.9	43.2	40.2	47.9	90.4	98.6	104.2

Table 11 Primary NER (%) by wealth status/expenditure quintiles

Data set	PSLM					ASER							MICS		
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	53.1	50.8	52.1	48.4	52.0	57.4	49.0	54.4	58.3	63.5	66.8	64.7	32.6	30.5	36.0
2	59.9	63.4	55.3	54.9	53.4	66.3	62.7	65.4	67.0	72.6	71.9	72.0	50.9	50.5	53.8
3	63.4	69.5	61.1	63.8	60.5	69.4	67.9	68.2	68.9	76.2	71.8	74.6	60.5	61.2	59.6
4	67.8	70.9	65.4	68.8	64.1	75.1	72.0	75.3	74.8	73.4	74.4	76.7	65.8	65.3	62.3
5 (rich)	72.5	74.0	70.8	72.2	69.6	77.6	76.0	78.2	75.8	76.1	75.4	79.3	69.4	68.5	63.4

Table 12 Drop-out rates (%) by wealth status/expenditure quintiles

Data set	PSLM					ASER							MICS		
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	7.8	10.9	8.5	11.5	7.2	10.3	9.2	9.9	11.1	8.3	7.9	6.8	8.6	10.7	13.7
2	8.7	11.0	8.2	9.7	8.0	8.6	11.7	7.4	9.3	8.2	7.1	4.6	11.0	13.0	12.3
3	8.8	6.7	9.1	8.6	8.0	9.0	8.0	10.1	8.3	5.6	6.4	4.2	10.1	11.0	9.7
4	8.6	5.1	8.7	5.7	8.1	6.3	6.0	6.0	6.1	5.4	5.1	4.3	8.6	8.1	7.6
5 (rich)	6.4	6.3	6.9	2.6	6.3	4.0	4.1	3.5	4.6	3.9	3.5	3.0	5.3	5.2	5.0

Note: Differences in the drop-out rate by wealth or expenditure quintiles show varying levels of significance and non-significance without a clear pattern. More detail about the significance levels can be found in the data set specific annexure.

3.3.3 The state and non-state sectors in providing access to education

The non-state sector provides educational access to an increasingly larger share of school-age children in the Punjab

One of the most notable trends in education provision within Pakistan has been the mushrooming of the non-state sector as a popular alternative to state provided education, increasing the options parents have for education providers (Andrabi et al., 2007, Aslam 2009). Non-state schooling encompasses a wide array of providers operating at different scales, scope of operations, extent of penetration across locations and in terms of their management structures, financing arrangements, and their relationship with the government (Aslam, 2017). Within the different models of non-state provision (which range from sole-proprietor schools to chains and franchises to public-private partnerships in various guises and forms), the emergence of what is known as the 'low-fee private school' (LFPS) has captured the attention of many and has led to a vibrant debate both within the country and beyond (sometimes unfounded on evidence). Low-fee private schools encompass a broad spectrum of providers but typically tend to be dependent on user fees to cover all or part of their operational and development costs (Ashley et al., 2014). There are though numerous challenges in piecing together a true picture of the nature and scale of 'private' provision within the country. One of the main challenges in understanding the role of the private sector in education provision has been lack of reliable documentation and data. Despite these challenges, there is now a recognition within the country that various forms and guises of non-state or 'non-government' schools now provide educational access to large populations of children in urban as well as in rural areas.

Overall, the share of private primary education in Pakistan in 2015 was documented to be 39% (Carneiro, Das and Reis, 2016). The growth of private schools, especially the LFPS, is arguably most visible in Punjab and Khyber Pakhtunkhwa provinces. For example, some argue that virtually all the gain in school participation in Punjab over the 2004/05 and 2010/11 period especially at the primary level is attributable to private schools (Aziz et al. 2014). Table 13 reports participation rates for children aged 5-16 years studying in diverse types of schools as reported in the PSLM, Nielsen, ASER and MICS data sets. Broadly speaking, the data sets confirm the finding from previous reports and discussions that the private sector provides educational access to a large share of the school-age population in the Punjab with an estimated between 41-43% of all children aged 5-16 years participating in school doing so in some form of 'private' institution (excluding *madrassah* and 'other' types of institutions) according to latest PSLM and Nielsen estimates. The ASER estimates are lower – 36.4% in 2019 – but this estimate must be caveated with the rural nature of the ASER data set.[10]

Table 14, Table 15 and Table 16 report the share of NERs by school type at the Primary, Middle and Secondary levels in the Punjab according to the PSLM, Nielsen, ASER and MICS data sets. The tables report what share of the total net enrolment at a given education level is in the government, private or *madrassah* schooling types. It is clear that all data sets are reporting roughly identical patterns in trends in enrolment across time and across the different education levels. The 'private' sector is most prominent in the country at the primary level and much less so at the Middle and Secondary education levels. Overall, data sets report an increasing share of private schools and a decreasing or stagnant share of government schools in participation and enrolment (rural data from

[10] The incidence of private provision is most significant in urban Punjab and less so in rural Punjab (though still substantial given the size of the rural population, Andrabi et al. 2008a).

ASER shows slight increases in both government and private shares of middle and secondary enrolment). Reports of a 'mushrooming' of the non-state sector, of 'private' section, from the 1990s in the country on the whole and in the Punjab in particular is also evident from more recent years, although this share has not consistently increased over time.

Table 13 Participation (5-16 years) by school type (%)

	Government	Private	Madrassah	Other
PSLM				
2012/13	60.5	37.4	1.9	0.2
2013/14	56.5	42.9	0.5	0.2
2014/15	56.6	42.2	1.0	0.2
2015/16	54.1	43.4	2.2	0.3
2018/19	55.3	43.6	0.9	0.2
Nielsen				
Nov. 2011	61.6	36.8	1.6	
Jun. 2012	62.1	35.7	2.2	
Nov. 2012	61.9	35.3	2.9	
Jun. 2013	61.8	35.1	3.1	
Nov. 2013	61.5	35.9	2.6	
Nov. 2014	59.9	37.6	2.6	
Jun. 2015	60.6	36.7	2.7	
Dec. 2015	60.8	37.1	2.1	
Mar. 2017	55.4	41.3	3.2	
ASER				
2012	65.9	31.6	1.5	1.1
2013	62.0	35.4	1.3	1.3
2014	58.5	38.9	1.3	1.3
2015	61.4	35.8	1.4	1.3
2016	65.7	31.6	1.4	1.3
2018	72.4	25.7	1.0	0.9
2019	62.1	36.4	0.8	0.7
MICS				
2011	63.4	36.3	0.2	0.0
2014	60.7	39.2	-	0.1
2017/18	61.0	38.1	0.7	0.2

Table 14 Primary NER (%) by school type

	Government	Private	Madrassah	Other
PSLM				
2012/13	36.4	25.5	0.3	0.1
2013/14	33.9	30.3	0.0	0.0
2014/15	32.4	28.2	0.2	0.2
2015/16	29.4	28.8	0.5	0.1
2018/19	30.3	28.7	0.3	0.2
Nielsen				
Nov. 2011	38.5	26.6		
Jun. 2012	36.9	24.0		
Nov. 2012	35.7	21.9		
Jun. 2013	33.1	21.8		
Nov. 2013	30.4	20.1		
Nov. 2014	28.9	20.1		
Jun. 2015	37.7	26.2		
Dec. 2015	35.6	24.2		
Mar. 2017	33.3	28.7		
ASER				
2012	45.8	24.6	0.7	0.8
2013	41.5	27.4	0.5	1.1
2014	42.2	29.3	0.5	1.0
2015	44.1	26.8	0.5	1.1
2016	46.9	24.3	0.6	1.1
2018	51.8	20.1	0.3	0.9
2019	47.8	26.8	0.4	0.7
MICS				
2011	31.1	22.3	0.1	0.0
2014	28.3	24.6		0.0
2017/2018	29.5	22.7	0.3	0.1

Table 15 Middle NER (%) by school type

	Government	Private	Madrassah	Other
PSLM				
2012/13	15.5	9.1	0.2	0.0
2013/14	14.2	10.5	0.0	0.1
2014/15	14.5	9.9	0.1	0.0
2015/16	13.7	9.9	0.2	0.0
2018/19	15.2	12.0	0.2	0.0
Nielsen				
Nov. 2011	17.0	8.6		
Jun. 2012	17.9	9.7		
Nov. 2012	15.7	8.1		
Jun. 2013	18.6	8.8		
Nov. 2013	15.7	8.4		
Nov. 2014	14.1	8.0		
Jun. 2015	18.7	9.9		
Dec. 2015	15.2	8.4		
Mar. 2017	13.7	10.0		
ASER				
2012	22.0	9.4	0.2	0.2
2013	22.3	10.3	0.1	0.2
2014	23.1	12.1	0.2	0.3
2015	19.6	11.2	0.2	0.2
2016	23.6	10.0	0.2	0.2
2018	23.0	6.5	0.2	0.1
2019	24.9	10.9	0.3	0.2
MICS				
2011	15.3	9.3	0.0	0.0
2014	16.1	10.4		0.0
2017/2018	13.7	9.1	0.1	0.0

Table 16 Secondary NER (%) by school type

	Government	Private	Madrassah	Other
PSLM				
2012/13	17.4	9.3	0.2	0.0
2013/14	16.5	11.4	0.0	0.1
2014/15	17.0	10.1	0.1	0.0
2015/16	16.4	10.9	0.0	0.1
2018/19	18.9	12.1	0.3	0.1
Nielsen				
Nov. 2011	17.0	8.3		
Jun. 2012	17.4	8.5		
Nov. 2012	11.4	5.7		
Jun. 2013	20.7	10.3		
Nov. 2013	18.2	9.0		
Nov. 2014	17.7	9.7		
Jun. 2015	23.1	10.7		
Dec. 2015	19.8	10.6		
Mar. 2017	18.2	12.3		
ASER				
2012	22.4	8.4	0.1	0.1
2013	24.2	9.6	0.2	0.1
2014	23.9	10.7	0.2	0.3
2015	22.2	10.7	0.2	0.1
2016	24.6	9.2	0.3	0.1
2018	26.3	7.4	0.2	0.2
2019	25.3	14.3	0.7	0.2
MICS				
2011	16.4	8.9	0.1	0.0
2014	18.5	10.1		0.0
2017/2018	16.8	11.6	0.2	0.0

Along with household data, analysis of administrative data from Punjab allows us to further triangulate these results. Since population estimates have been used to gauge participation and enrolment in public and private schools, only the primary age bracket (5-9 years) is directly comparable to the analysis above. As shown in **Error! Not a valid bookmark self-reference.**, around 38-39% of 5-14 years participate in government schools, a much conservation estimate than indicated by household survey data. A comparison of primary NER, which is directly comparable between household survey and administrative data (Table 14 and Table 18) again shows that EMIS provides a much lower share of public school which has remained static between 2012 and 2015. Overall government share of primary GER has increased by almost 8 percentage points between 2012 and 2019, particularly after 2015 (Table 19), a trend opposite to what we observe in household data. Comparison of the PSC rounds shows that private share of primary GER has increased by

almost 7 percentage points between 2011 and 2016 (Table 19). Data from 2016, where there is enrolment information from both public and private schools shows that share of the private sector is not much behind that of the government sectors, and increasing playing an important role in the education landscape.

Table 17 Participation rate (%), share of government schools (EMIS)

	2012	2013	2014	2015
Overall (5-14 years)	37.9	39.3	38.9	38.2
Age Group				
5-9 years	47.6	49.3	48.8	47.6
10-14 years	27.6	28.8	28.5	28.2

Table 18 NER (%), share of government schools (EMIS)

	2012	2013	2014	2015
Primary level (Grade 1-5 & 5-9 years)	28.1	28.6	28.6	28.0
Middle level (Grade 6-8 & 10-14 years)	15.8	16.7	16.2	15.4

Table 19 Primary GER (%) by school type

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Share of government schools (EMIS)										
Overall		39.1	39.7	39.9	39.6	41.2	45.3	47.3	46.7	42.0
Female		38.6	39.2	39.6	39.7	41.6	46.2	48.4	48.0	
Male		39.7	40.2	40.1	39.4	40.9	44.6	46.2	45.4	
Share of private schools (PSC)										
Overall	31.5					38.1				
Female	30.2					37.0				
Male	32.8					39.2				

Table 20 Middle GER (%) by school type

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Share of government schools (EMIS)										
Overall		17.6	18.2	18.1	17.7	17.5	18.4	19.4	19.9	19.8
Female		16.2	17.0	17.1	17.0	17.2	18.6	19.8	20.5	
Male		18.9	19.2	19.0	18.3	17.9	18.3	19.0	19.3	
Share of private schools (PSC)										
Overall	10.8					13.0				
Female	10.8					13.0				
Male	10.8					12.9				

3.3.4 Disability and access to education

Disability can be a deterrent to accessing schooling particularly for girls and the poor

Persons with disabilities remain mainly overlooked, unheard and unseen in Pakistan (Japan International Cooperation Agency, 2002). Disability is both a cause and a consequence of poverty and marginalisation and children with disabilities face the greatest challenges in accessing education as compared to their non-disabled counterparts. The increased global focus on disability has shifted the lens to inclusive education and a growing realisation to focus on the disabled. The focus of the SDGs on a rights-based approach is especially pertinent in Pakistan where various disadvantages – poverty, gender, location and disability – intersect to create highly differential access to education which perpetuates the cycle of disadvantage. Data sets that allow us to gauge educational access by disability status within the Punjab – ASER, Nielsen and MICS (with far richer and more accurate information available from the TEACh project data, see below).

Nielsen data provided one way of identifying pupil 'disability status' by asking very simple questions. Disability questions were only asked from Wave 6 onwards. In the latest Wave 9, conducted in March 2017, the survey introduces an extensive child health and functioning module similar to ASER, limiting comparability with previous rounds. Table 21 summarises the Primary, Middle and Secondary NERs by disability status according to the Nielsen rounds of data. According to this data set and the way in which the data has been collected, disability is clearly a significant marker of disadvantage with those reporting disability almost invisible in the schooling system at all levels of education. The large increase in enrolment of children with disabilities in March 2017 can largely be explained by adopting a more nuanced measurement of disability.

Table 21 NER (%) by disability status at each education level (Nielsen)

	Nov. 2014	June 2015	Dec. 2015	Mar. 2017
Primary NERs				
No disability	49.2	64.3	60.2	62.3
Disability	1.6	4.2	4.3	39.6
Middle NERs				
No disability	22.2	28.9	23.6	23.9
Disability	0.8	2.9	3.6	16.4
Secondary NERs				
No disability	27.6	34.0	30.6	30.6
Disability	0.6	1.0	2.6	19.3

Source: Nielsen Surveys

The Nielsen data suggests limited improvements in access for those reporting disability. However, academics working on disability have been critical of how disability has typically been captured in annual census data and in household and school surveys. Given the stigma attached to disability in many contexts, the way the question is asked is of critical importance. Simply asking 'does (name) have a disability?', therefore, is likely to generate very inaccurate responses in most contexts. Whilst Nielsen has collected data using this former approach, the ASER, MICS and TEACh data sets have adopted more novel approaches to collecting information on disability status in the country. In particular, ASER data collected information based on the Washington Group on Disability Statistics short list of questions and rather than simply asking respondents whether a given child has a disability or not, focused on 'difficulties' that children might have in undertaking basic activities as

compared to other children in their peer group (Singhal and Sabates, nd). Furthermore, the latest round of MICS administered the Washington Group 'Child Functioning' module to one child in the household that fell in the 5 to 17 year age bracket, at random.

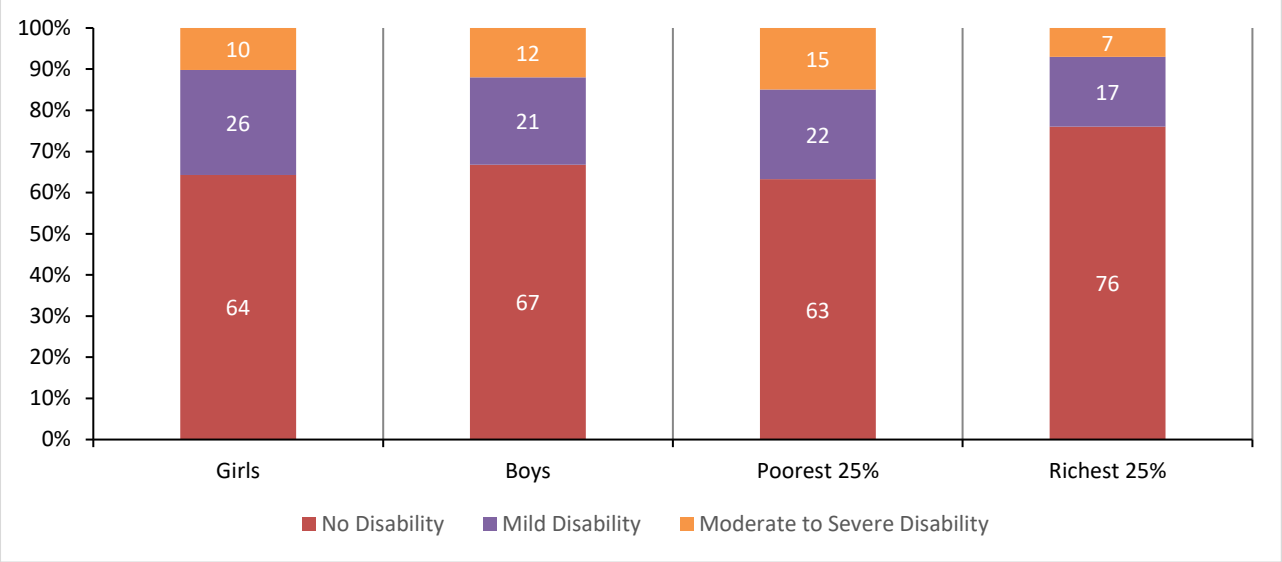
ASER and MICS data have reported that children with 'moderate to severe' difficulties are least likely to be in school. These children are more likely to never have been enrolled in school (in contrast to those reporting no difficulties). Table 22 reports NERs by disability status calculating using ASER data from 2015-2018, and MICS data from 2017. It is also worth noting that the ASER 2015 disability section was only carried out in rural areas and the statistics from this period are not reflective of urban areas in this year. Based on this, Table 22 below reports a significantly higher incidence of access by disability than the Nielsen survey with more than half the children reporting 'severe' disability enrolled in school in 2015 and almost 64% enrolled in school in 2018 at the primary level, according to ASER. The MICS estimates are much lower. Enrolment declines for those reporting disability at higher levels of education (though it does for the non-disabled as well but not to the same extent). Some numbers have to be reported with caution such as middle NER for children with severe disabilities in 2018 as this can be driven by low number of observations.

Table 22 NER (%) by disability status at each education level

	ASER			MICS
	2015	2016	2018	2017/18
Primary NERs				
None	73.5	73.4	73.3	54.0
Mild to moderate	68.8	72.8	70.8	51.5
Severe	53.2	76.7	63.7	42.4
Middle NERs				
None	31.3	34.0	29.8	25.7
Mild to moderate	31.3	36.5	23.6	24.9
Severe	42.9	34.6	68.6	18.4
Secondary NERs				
None	33.2	34.2	34.4	32.3
Mild to moderate	31.9	33.9	25.6	33.3
Severe	14.7	26.2	37.3	24.2

Teaching Effectively All Children (TEACh) data provides a unique angle on disability status within the Punjab (based on data collected on 8-12 year olds through household and school surveys in 3 districts). Using questions on functional disability developed by the Washington Group, TEACh has collected information on the incidence of disability for children aged 8-12 years in three districts of Central Punjab (Kasur, Sargodha and Hafizabad). Rose et al. (2018) provide extensive detail on the types of questions asked and how they differ from ASER. Overall, TEACh reports a much higher prevalence of disability than previously reported in the Punjab – an incidence of 11% for children aged 8-12 as opposed to 1-2% using ASER data for a similar age group and in the same districts where TEACh collects data. TEACh survey data suggests that the prevalence rates of disability are similar for males and females but that children with disabilities are more likely to be found in poorer households (Figure 3).

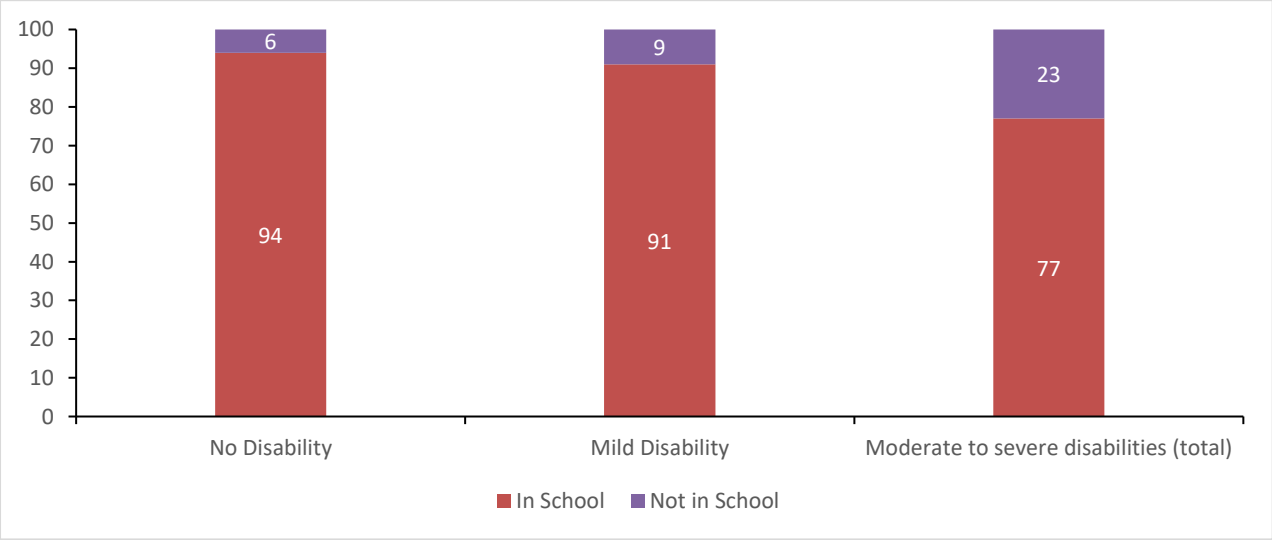
Figure 3 Intersection of disability with gender and poverty (8-12 year olds; %)



Source: TEACh data, Rose et al. (2018).

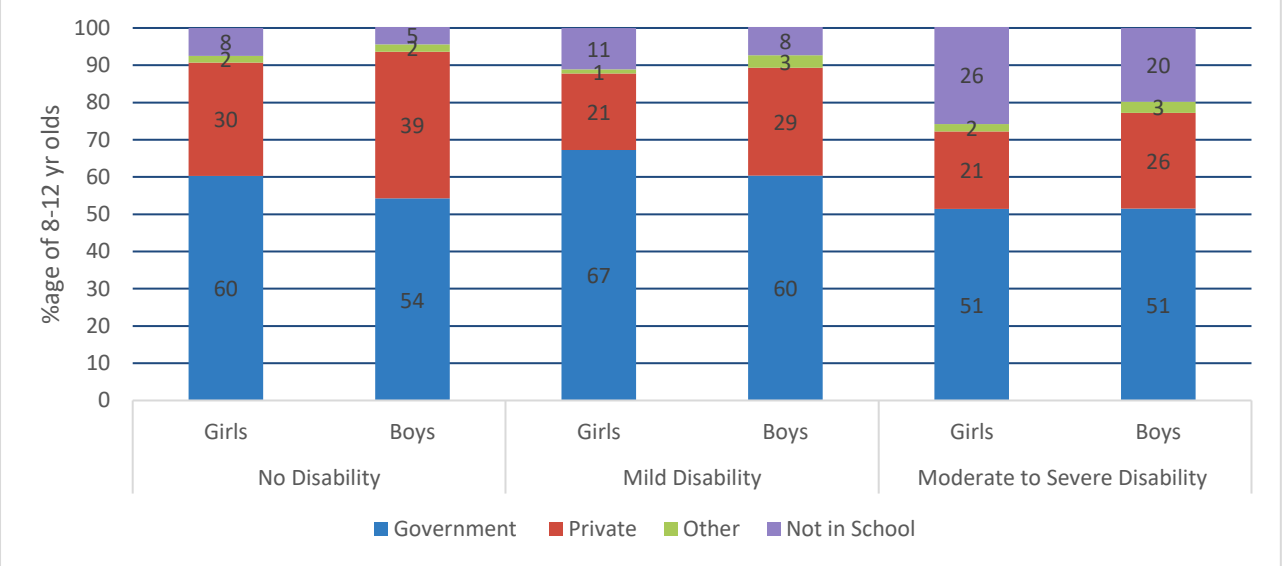
TEACh data also suggests that whilst children with disabilities are more likely to be out of school than their peers (with children with moderate and severe disabilities to be most likely to be out of school), a large proportion of children with disabilities who are in school are actually in mainstream schools (Rose et al. 2018). Figure 4 illustrates the likelihood of children in the sample age being out of school based on disability status with the most notable finding being that a reasonable proportion of children reporting disability appear to be in school. Rose et al. (2018) further note that some children with disabilities are in private schools with gendered differences apparent in this regard. In particular, boys with disabilities are more likely to be in private schools whilst girls are more likely to be out of school, irrespective of their disability status (Figure 5). The authors of this policy brief note that the absolute numbers in their samples are very low and drawing direct policy conclusions from these small sizes requires caution.

Figure 4 Children out of school by severity of disability (%)



Source: TEACh data, Rose et al. (2018)

Figure 5 Type of school attended (%), by disability and gender



Source: TEACh data, Rose et al. (2018)

3.3.5 Comparing access to education across provinces

Punjab has fared consistently better than most provinces in Pakistan in educational access during the evaluation period

Table 23 and Table 24 report participation rates (5-16 year olds) and NERs at the primary level for children in the Punjab as compared to equivalently aged children in other provinces (and regions) in Pakistan. It is clear that Punjab's performance in getting children into school has been consistently better when compared to other parts of the country during the evaluation period.

Table 23 Participation rates (%; 5-16 years), by province/region

	PSLM					ASER						
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019
Punjab	74.6	73.2	74.6	73.8	79.1	83.7	84.6	85.8	85.0	85.8	88.8	92.0
KP	70.9	68.2	72.9	68.8	68.9	82.2	85.2	84.0	86.4	84.0	84.1	84.2
Sindh	60.3	56.2	61.2	56.4	58.4	68.3	73.7	77.1	77.5	77.2	85.1	87.9
Balochistan	52.0	49.2	56.6	44.4	41.0	63.8	63.6	66.6	68.9	62.6	70.1	71.0
AJK						91.7	94.4	93.3	95.3	95.5	94.4	96.9
FATA						73.0	77.4	78.0	77.9	83.2	69.9	70.3
Gilgit-Baltistan						82.1	81.7	83.9	83.0	85.7	89.2	91.1
Islamabad - ICT						93.0	92.9	99.5	97.8	93.0	90.6	95.9
Total	69.3	66.5	69.9	67.1	69.9	76.0	78.4	79.4	80.2	79.1	81.6	84.0

Note: The differences in the participation rate between Punjab and other regions, with the exception of Gilgit-Baltistan and ICT, are significant at the 95% confidence level or above. More detail about the significance levels can be found in the data set specific annexure.

Table 24 Primary NER (%) by province/region

	PSLM					ASER						
	2012/13	2013/14	2014/15	2015/16	2018/19	2012	2013	2014	2015	2016	2018	2019
Punjab	62.3	64.3	61.1	58.8	59.6	71.9	70.6	72.9	72.4	73.0	73.1	75.7
KP	53.9	54.2	56.4	52.6	47.8	64.7	67.4	65.8	69.8	64.8	59.3	64.3
Sindh	52.3	48.5	51.0	48.3	47.7	61.8	66.0	67.5	67.5	68.1	61.1	72.4
Balochistan	44.7	38.7	46.1	32.7	33.0	35.4	41.6	40.9	54.7	45.9	41.0	51.9
AJK						74.4	72.6	73.0	74.8	78.3	66.7	67.3
FATA						55.7	59.1	57.8	63.4	65.7	51.3	58.0
Gilgit-Baltistan						60.3	57.6	57.5	58.9	61.7	61.7	53.6
Islamabad - ICT						80.1	75.4	96.4	81.7	76.1	66.0	76.2
Total	57.5	56.7	56.7	53.7	52.8	58.4	61.7	61.5	65.7	63.5	57.4	63.9

4 Evidence on Pupil Learning Outcomes

4.1 Introduction and overview

This sub-section of the report focuses on the status of pupil learning outcomes in the Punjab during the evaluation period. As mentioned earlier, identifying the extent to which learning outcomes have changed, if at all, in the Punjab during the evaluation period forms a core component of the underlying conceptual framework and programme effectiveness. This section has reported on how learning outcomes have changed, if at all, in the Punjab during 2012-early 2020 using LND data, DFID 6MA data and ASER data (mainly rural). The first two of these data sets collects learning outcomes data for Grade 3 pupils whilst the latter data set collects pupil outcomes information for all children aged 5-16 years (on Grade 2 and some Grade 3 competencies). Data are mainly collected on basic literacy and numeracy (English, Urdu and Maths) mainly with some variations in ASER depending on which part of the country children are assessed in, and are either school based (LND and DFID 6MA) or household-based (ASER). Reported data from PEC, SABER SD, TEACh and MICS are also discussed.

The analysis of the raw data across these different data sets for the 2012-early 2020 period for the Punjab has revealed that there have been marginal gains in learning outcomes in the province (LND/DFID 6MA) across most competencies. There are differences by location, gender and school type. Limited data from one year shows that students are not performing at the grade level (SABER SD). This report emphasises that these marginal improvements in learning outcomes do not signify failure for the province because learning outcomes are cumulative and more complex to change (as they depend on policy amenable factors such as effective teaching, conducive school environment etc. as well as factors such as family background, a child's innate ability etc. that are typically more difficult for policy makers to target). Another critical point to note is that understanding whose learning is being assessed becomes all the more important because if more disadvantaged children enter school and are assessed, the chance of observing major improvements in learning over time is limited. The success lies in getting these children into school, followed by retaining them long enough in the system to show meaningful improvements in learning. This requires collecting data with information not simply on learning outcomes but also data that allows linking these outcomes to school, teacher and household level variables that are known to impact learning. In doing so, more robust and useful analysis of which factors impact learning outcomes can be achieved.

ASER is mainly a rural data set that reports learning outcomes as scaled scores (a child is able to read nothing, a child is able to read a word etc.). It indicates low levels of learning across mainly rural Punjab with large proportions of school-age children unable to achieve the most basic outcomes in literacy and numeracy. Still, there have been slow improvements in these outcomes particularly in the latest rounds (2018-2019). This data set also allows for a more nuanced analysis of learning outcomes by allowing disaggregation by SES. Low wealth emerges as a clear marker of disadvantage and this is especially so for girls – poorest girls in rural Punjab remain the most marginalised in terms of their learning outcomes. There have been some improvements with poorest girls catching up to poorest boys in the latest round. Limited household assessment data from both rural and urban Punjab shows that children in urban areas outperform their peers in rural areas, particularly in terms of literacy (MICS).

4.2 Data sources and quality

4.2.1 Overview

The DQA I report identified five data sets that provide information on educational attainment (Nielsen, LND, PSLM, ASER and DFID 6MA data). Of these, the LND data (on-going) and the DFID 6MA data was collected within schools whilst the rest collect information within households. Of these, only PSLM and ASER cover the entire duration of the PESP2 time (2012 onwards). All these data collection initiatives (except PSLM and Nielsen) assess children in Maths, English and Urdu. Of the data sets assessing children, the LND and DFID 6MA targeted Grade 3 children on *katchi*-Grade 2 SLOs (in schools) whilst ASER assesses basic literacy and numeracy based on Grade 2 (and some Grade 3) curriculum competencies targeted at children aged 5-16 years within households. Comparing these data sets in relation to educational attainment is complex because each of these data sets assesses/collects data on different aspects with each initiative stemming from a different objective. Nevertheless, each of these data sets can provide useful insights into the relationship between the PESP2 programme and educational attainment of children in Punjab with ASER potentially providing a comparative picture across other provinces albeit mainly in a rural setting. TEACh data also provides a rich source of information on learning outcomes albeit at one point in time and in three districts of Punjab. Similarly, the latest round of MICS also tested foundational reading and numeracy skills for children aged 7-14 years in the household.

These data sets have certain limitations. The LND data reports school-level averages which likely mask disparities so can only provide a high-level picture. However, even small improvements in outcomes that truly represent the entire age group are likely to be more illustrative of system-wide improvements. On the other hand, the DFID 6MA data provides student level scores. With these types of data it is particularly important to identify who the students are who are being assessed. If learning outcomes have improved even marginally, but the pupils who are being assessed are from particularly disadvantaged backgrounds, even marginal improvements reflect equitable system wide changes. ASER data report outcomes in a different way, which does not allow comparison across the three data sets.

There are therefore three main data sets that allow us to present the evidence on pupil learning outcomes in the Punjab as shown in Table 25 and Table 26.

Table 25 Learning outcomes data sets: Data directly analysed

Data Set	Where are assessments done?	Grade level/ Age	Coverage	Assessments	Disaggregation possible
Learning and Numeracy Drive - LND (2015-2020)	School-based, monthly in government schools	Grade 3 pupils	All districts in the Punjab; documentation indicates that 43,000 schools in Punjab (ideally all government schools) with approximately 230,000 children are covered in each round	The assessments aim to cover SLOs (Student Learning Outcomes) on basic literacy and numeracy (from Grade *Katchi* to Grade 2) and include assessments in English, Maths and Urdu. Multiple choice Tested on tablets	None – data are coded as school-level averages
DFID's Six Monthly Assessment Data (6MA) (2014-2018)	School-based, test conducted twice a year (beginning of the school-year in September and end of school year, March).	Grade 3 pupils	5,600 students in 36 districts in the Punjab. Students in government and Pakistan Education Foundation (PEF) schools	Students tested in basic literacy and numeracy SLOs of grade *Katchi* to Grade 2 curriculum. The test has 8 questions for Maths, 6 for English, and 7 for Urdu with the total length of the test not being long and not causing fatigue. Word problems for Maths are also available in the local language.	By school type, school level and school gender – data are presented as student-level averages
Annual Status of Education Report – ASER (2012-2019)	Household; annually	All children aged 5-16	All districts of Pakistan. 30 villages per district and 20 households per village in rural areas. For urban areas, number of blocks selected per district ensure significance. Sample sizes vary but in Punjab alone about 59,000 children sampled (aged 3-16).	Assessment of Language (Urdu/Sindhi/Pashto), English and Arithmetic based on Grade 2 curriculum.	By age, gender, SES, rural/urban, province and in some years by disability status. Data are coded at the pupil level

Table 26 Learning outcomes data sets: Data sourced from reports

Data Set	Where are assessments done?	Grade level/ Age	Coverage	Assessments	Disaggregation possible
TEACh (2016/2017)	Household and school	Children aged 8-12 (Grades 3-5)	Three districts in Central Punjab (Kasur, Sargodha and Haryana) about 1500+ children sampled	Used ASER tools and Young Lives[11] tools to assess pupils aged 8-12 in households and in Grades 3-5 in schools (at the beginning and end of the school years) allowing value-added estimates. Students were assessed in literacy and numeracy.	By gender, SES and disability status. Data are coded at the pupil level.
Punjab Education Commission - PEC data	School-based; annually	All children in Grades 5 and 8 in schools in the Punjab	Mandatory for all government schools (optional for private schools) in Punjab	Mandatory centralized paper-based examinations in the English, Urdu, Mathematics, Science, Islamiyat	By school characteristics, exam characteristics and student gender.
Multiple Indicator Clusters Survey - MICS (2017/2018)	Household; annually	Children 7-14 years. Module randomly administered to one child in the 5-17 age bracket in household	All districts in Punjab. The total sample size was 53,840 households.	Assessment of minimum proficiency in reading and mathematics at the Grade 2-3 level. A child demonstrates foundational reading skills if they are able to complete 3 reading tasks and foundational numeracy skills if they complete 4 mathematics tasks.	By gender, socio-economic status, rural/urban and disability status. Data are coded at the pupil level.
SABER SD (2018)	School-based	18,055 children in Grade 4	Stratified random sample of 812 public, private and PEF schools in Punjab	Assessed children mastery of curriculum (Grade 1-4) in primary school. Written assessment used in the LEAPS[12] study which consisted of a 'listening' section following by Urdu, English and Mathematics sections.	Preliminarily findings discuss results by pupil gender, grade and subject.

Source: DQA. TEACh data are not currently publicly available. Published findings are presented below.

[11] https://www.younglives.org.uk/
[12] (Andrabi et al., 2008b)

There are several points worth highlighting. The data sets for which we have been able to access the primary data typically assess pupils in the early primary grades (Grade 3). The exceptions are ASER, which assesses *all* children aged 5-16 years regardless of education status or level of schooling; TEACh, which assesses children aged 8-12 years in households or children in grades 3-5 in schools in three districts. MICS, too, assesses children aged 7-14 years in the household. All assessments capture pupil learning in at least literacy and numeracy with some additionally assessing pupils in local languages (ASER) and English. They are typically based on Grade *katchi*-Grade 3 curriculum (with TEACh in addition basing assessments on the Young Lives format and the ASER tools from Pakistan). Despite these common features, the assessments are not directly comparable and this analysis does not attempt to compare them. The lack of comparability stems from various aspects – objectives of the intended assessment, which grade level or age group were administered assessments, the SLOs which underpin them, whether the assessment was administered at the school or at home etc. The objective in this section, therefore, is to report the key findings from the data and note the trends and patterns that emerge over the timeline on which the relevant learning data are available.

4.2.2 Learning and Numeracy Drive data

The LND data set has several advantages and it has been possible to utilise it to a limited extent to provide insights into changes in learning outcomes in the Punjab. A key apparent strength of this data set is that it provides learning outcomes data on a large number of children in Grade 3 in government schools across all districts of Punjab. The data are collected on a regular basis and provide assessment results on basic competencies in English, Urdu and Mathematics. The main strengths of this data set are that: (i) assessments are conducted on a regular basis; (ii) SLOs are specific and consistent (note that as previously noted version 2 extends the SLOs assessed); (iii) results are available in a timely manner and; (iv) the mode of assessment (app on a tablet) reduces instances of cheating, limits missing data and allows for real-time data access. An additional feature of the data set is the fact that the availability of the school EMIS code could potentially allow for linking the assessment data with school-level data from EMIS sources which would allow for more detailed school-level outcomes analysis. Furthermore, the data set is fairly large and covers between 25,000 and 49,000 government schools at any given time (based on raw data available to us from 2015 to 2019).

This data has several limitations. First, only data on learning outcomes is collected and information is not available on any other variables of interest that may allow a more nuanced analysis such as that by SES etc. Even in relation to learning outcomes, the data cannot be linked to individual pupils, which would have allowed for disaggregation by categories such as gender. Whilst this data set covers a very large number of observations, the small number of students per school tested means that samples are not representative at the school level, making analysis at this level impossible. Therefore, whilst the raw data does allow for basic descriptive statistics to be presented on each of the three subject areas (English, Urdu and Maths) at the school level, these results cannot be disaggregated down to the SLO/competency level. This information appears to be generated (based on the reports and presentations reviewed) but is not currently available to us. Whilst six (or seven) students per school can be argued to be non-representative, the estimates do provide an indicative 'overall' average of changes in learning outcomes over time if those six students are truly randomly selected. The documentation provided to us notes these and additional limitations as follows: 'LND is not an exhaustive literacy and numeracy assessment since only a limited set of SLOs are tested; LND cannot test oral or written skills; LND cannot retain student specific data; LND results are not

statistically representative at school level'. Whilst analysing the data, it was also observed that the number of observations were different for each year and some observations were missing for one or more subjects. This meant that some students who were given the LND computer application did not report data for some of the subjects and did report for others. While the protocol specified them to complete the entire test, the data shows missing values for one subject and shows complete values for the other. Hence, it is also unclear how an assessment could have been completed without completing one of the subjects. The possible biases from non-random non-completion are also not clear.

It is also important to note that school-level averages are likely to mask both progress as well as disparity in that improving averages could be driven by a few students (especially if they are deliberately selected to be assessed) in which case they are not illustrative of any real improvements in learning outcomes. As has been stated already, it is important to consider the profile of pupils who are enrolled when analysing learning outcomes data as the backgrounds and home environment of pupils from more disadvantaged groups may influence their learning trajectory given the same quality of schooling.

Nevertheless, this data set does allow us to paint an indicative picture of changes in learning outcome levels in the state of Punjab if the instruments used truly test the competencies specified and if these are indeed the competencies on which we want to base judgements. Finally, this initiative only collects learning data based on right and wrong answers. Meaningful learning assessment data requires much more nuanced instruments that gauge true learning. Therefore, this data set has only allowed us to present some trend patterns on 'correct' responses and that too of 'school-averages' for the duration for which the data are available.

4.2.3 DFID Six Monthly Learning Assessment

The DFID 6MA data set was designed for project purposes so it targeted a specific set of pupils rather than at the general population, and was administered during 2014-2018. The data are representative at the provincial level, and by the nine divisions of Punjab. The learning outcomes assessed competencies in three subject areas – Maths, Urdu and English – and the raw data are available at a student-level (rather than a school-average as in the LND data). Furthermore, the raw data are available on a question-by-question basis, allowing for more thorough analysis, such as better reporting and psychometric evaluation of the assessments (like estimating reliability). An additional feature of this data is that it can be disaggregated by school characteristics (type, level and gender) and geography (district). Certain rounds also contain information on student gender and rural/urban location. A key limitation is that there is no further information available on each individual child (such as age, SES etc.). Also, there may be potential biases arising from how non-responses are managed. Nevertheless, this data set has allowed for a more nuanced presentation of learning outcomes. In order for us to be able to say something more meaningful, the results presented in this report examine learning at the student level. The fact that data are available by SLO level is also useful but only to the extent that it allows the identification of weak and strong competencies by pupils.

The data set used different versions of SLOs in the survey instruments, but the level of difficulty in the SLOs is consistent and of the level of Grade 1 and Grade 2. The rest of the data collection methods remained the same and cannot be compiled to construct a panel data over the period of time we have data on. The data set did not retrace the same individuals over a period of time, but

rather it measured performance of different students in each term in Grade 3 to see periodical changes or improvement in performance over time. The time frame for the Six Monthly Assessments started from September 2014 and was carried out on a bi-annual basis in the months of September and March till March 2018. The SLOs measured in the survey instrument are spread out across multiple levels of cognitive domains and multiple versions of the test paper were developed to ensure reliability in test conduction. This data set used robust sampling procedures with PISA based sampling techniques to draw a representative sample from the population, but the sampling procedure is not clear and there is ambiguity about how exactly the students used in the sample were selected i.e. either the entire class population is exhausted or a random sample from the classroom was being used or not. Moreover, the treatment for non-response i.e. students who are not present for the test, is also not visibly documented.

The Six Monthly Assessment data set was carried out between September 2014 and March 2018. Since we only have data from September 2014, which is a few years after the PESP2 interventions, this limits the extent to which we can use this data set to comment on real changes during the evaluation period. Whilst it may be possible to conduct very simply regression analysis using this data set, in the absence of good control variables, the analysis is likely to reflect only correlational findings.

4.2.4 Annual Status of Education Report data

The final data set that we have used to undertake primary data analysis is the ASER data. There are several key strengths of this data set and some crucial weaknesses. These have been noted extensively in the section above. In addition to the points noted above and particularly with reference to the suitability of ASER data for evaluating learning outcomes, ASER collects basic literacy and numeracy outcomes data using Grade 2 (and some Grade 3) competencies in Urdu, Mathematics and English. Data are collected from children aged 5-16 years (on learning outcomes) and on overall educational outcomes (such as enrolment, drop-out etc.) for those aged 3-16 years. Additionally, data on assessments are collected from individuals within households, learning outcomes data are available on both children who are enrolled in school as well as those who may have dropped out or never gone to school. This is the only data set of its kind as it allows for comparisons in outcomes to be made across these subgroups (more recently MICS also provides such data). ASER also collects data on children's participation in out-of-school tuition. This is a very important aspect when measuring a child's learning outcomes in relation to any public policy. Accounting for private tuition means that any estimate of the role an intervention has had on learning is a clearer reflection of that policy rather than due to household investments in private tuition.

There are important limitations in relation to how learning outcomes are measured. Firstly, the learning outcomes assessed are not grade-specific so that only very basic competencies are assessed for a very wide age range. Secondly, the ASER learning assessment tools are limited in scope. In particular, the instruments only measure capacity to perform simple functions and allow for analysis and reporting on levels of achievement rather than continuous total scores (for example, the data allows users to assess whether a child is at 'word' level or 'sentence' level in Urdu/English or 'subtraction' or 'division' level for example in Maths). The scaling of the data allows for the analysis to be reported in very restrictive ways in that the outcomes are reported typically as a child reported as being able to do 'nothing' versus being able to read a word, sentence, story etc. (or corresponding competency in mathematics).

4.3 Commentary on trends

Where possible, the learning data are disaggregated by gender (male versus female), location (rural versus urban), wealth quintiles (1=poorest and 5=richest) and disability. We also report province-wise analysis in some instances to compare the educational status in the Punjab with other provinces during the evaluation period.

4.3.1 Overview of trends in learning outcomes

Pupil Learning Outcomes have shown some improvements according to the school-based data sets covering all districts in urban and rural Punjab

As identified in the DQA exercise during the Inception Phase, there is a lack of secondary variables in the LND data sets. Some of the rounds code a gender variable but it is unclear what that means as scores are aggregated at the school level. Table 27 below depicts the **average school assessment scores**, both overall and by subject as estimated from the primary LND data from 2015 to early 2020. Because the underlying data are based on multiple choice questions, the overall scores have been calculated using the following formula:

Score = (number of true answers per school / [number of true answers per school + number of false answers per school]) * 100.[13]

Whilst the LND data are supposed to be conducted in every government school, the raw data does not appear to reflect this. The available sampling frame is not clear, and details of the sample are not consistent. It is also unclear how the sample schools are selected or if all the schools were visited. The documentation suggests that between 6-7 students are assessed in each sample school (both numbers are mentioned in the documentation). The documentation also suggests that students are chosen randomly but the raw data itself does not have information on how many students were tested within each school. An initial analysis of the raw data suggests that while the norm might be 6-7 students, large portions of the sample deviate from this student to school ratio.

This assessment is carried out through an application on tablets brought in by Monitoring and Evaluation Assistants (MEAs)[14]. There are 5-10 questions in each assessment. Grade *katchi* to 2 basic SLOs in English, Maths and Urdu are tested. The raw data available does not provide results at the SLO level. In version 1 of the LND data, the English section includes questions around sentence completion and matching pictures with words. The Urdu section also tests these objectives, along with combining letters into words. The Maths assessment tests simple addition, subtraction and multiplication. In version 2 of the LND, this list is expanded upon to include advanced literacy and numeracy SLOs such as spelling, singular/plural and division. It is unclear when version 2 was implemented. According to the app available to the public, all the questions are multiple choice

[13] It is worth noting that the denominator in the score formula is fairly consistent between schools but this is not always the case. For instance, while most schools report overall attempting 42 questions (assuming 7 students, this would suggest 6 questions/test) whilst some report attempting 32 questions. Additionally, approximately 25% of the sample also diverges from this in any given year.

[14] MEAs are monitoring and evaluation assistants that go out into the field and carry out school visits to collect data on specific indicators (including EMIS data). They are supervised at the district level and fall under the School Education Department.

and have three options from which a child can choose. There are ten questions - three English; two Maths and five Urdu.

Given the nature of these assessments (multiple choice and with three option responses), one would expect a child to get the answer right 33% of the times even if they don't know the correct response. Thus, the percentage correct responses indicate that children do appear to know at least the competencies being assessed. Table 27 illustrates that in September 2015 the average overall school score was 75.2% across Punjab with differences by subject – English appeared to be the subject where the true responses were the lowest at the school level (66.6%) whilst Maths was the strongest subject yielding true responses 81.2% of the times amongst Grade 3 pupils assessed. One observation from these data is that based on these school-level averages, a large percentage of pupils are able to score reasonably well. Another observation is that pupil learning outcomes amongst Grade 3 pupils (when presented as % true outcomes at the school level) seem to have shown some improvement during the five years (2015-early 2020) for which data are available. In particular, English scores have improved from 66.6% in September 2015 to 70.7% in February 2020, Urdu from 76.9% to 80.9% and Maths from 81.3% to 84.7% during the same period. Figure 6 graphically depicts this improvement in learning outcomes across subjects, with poor progress in the 2019/2020 school year. Dips of average performance in March or April of each year indicate the beginning of the school year.

DFID 6MA data provide another perspective on learning outcomes by subject for Grade 3 pupils across all districts in the Punjab. Unlike the LND data reported above, these data are not representative at the district level and are available for a limited time period. Data are available on English, Urdu and Mathematics scores and at the pupil level. Unlike the LND data, there are various further variables that allow disaggregation of the pupil outcomes in the DFID 6MA data set. In particular, these include gender (though student gender information is only available from March 2017 to March 2018), and school type. The latter variable provides particularly rich information as assessments have been conducted both in government and in Punjab Education Foundation (PEF) schools, which allows the disaggregation of data at this level. There is additional information available about the school, including whether it is for girls or boys and the level of the school (high secondary, high, middle, primary and mosque). Unfortunately, in the raw data available to us, school level and school-gender information is missing in most of the rounds (i.e. it is not recorded for each observation). The assessment data can be further disaggregated at the district level and by rural/urban location for one round (September 2016).

In order to provide a nuanced understanding, **average student assessment scores** by subject and by certain disaggregation using the formula below:

Score = (number of true answers per student in a given school/ [number of true answers per student in a given school + number of false answers per student in a given school]) * 100

The DFID 6MA also assessed *katchi*, English, Maths and Urdu (with the LND assessment understood to a test a sub-set of SLOs tested in the six monthly assessment). The SLOs are spread across Grade 1 and 2 level of difficulty. The SLOs for English are alphabet, spelling, picture word, sentence completion and comprehension. The SLOs for Urdu are *jor kay tor, tor kay jor, wahid jama*, picture recognition, *muzakkar monus*, sentences and comprehension. The SLOs for Maths are missing numbers, addition, fraction, subtraction, multiplication, time, division and word problem. Average scores have been calculated by these SLOs in the data analysis (see Table 30 and Table 31 below) and changes in student scores in more complex tasks (e.g. fractions) can be captured to

some extent. This is a paper-based test and has eight questions for Maths, six for English, and seven for Urdu. According to the sample test that is available to us, the questions were a combination of multiple choice responses and fill in the blanks. It is also worth noting that both the LND and Six Monthly Assessment are comparable across time as the SLOs have remained predominantly the same. According to the TAMO report of the Six Monthly Assessment, the SLOs are spread across various levels of cognitive domains – such as remember, understand, apply and analyse (with higher order SLOs of 'evaluate' and 'create' not part of the Grade *Katchi*-2 curriculum and hence not tested as domains in the test).

Table 28 and Table 29 below report the student-level average scores by subject, by school level and by school gender for September 2014 and March 2018 (the earliest and the latest rounds of primary data available to us). In September 2014, the overall student-average score across all subjects assessed at the Grade 3 level is 59.2%. Urdu is the lowest scoring subject with an average score of 50.1% at the student-level. The remainder of the table provides scores by category – in English the average student in a school that went up to the primary level scored 59.6% whilst the average student in a school going up to the high school level scored 66.8%.

Figure 6 Average school-level score (%), LND data by subject

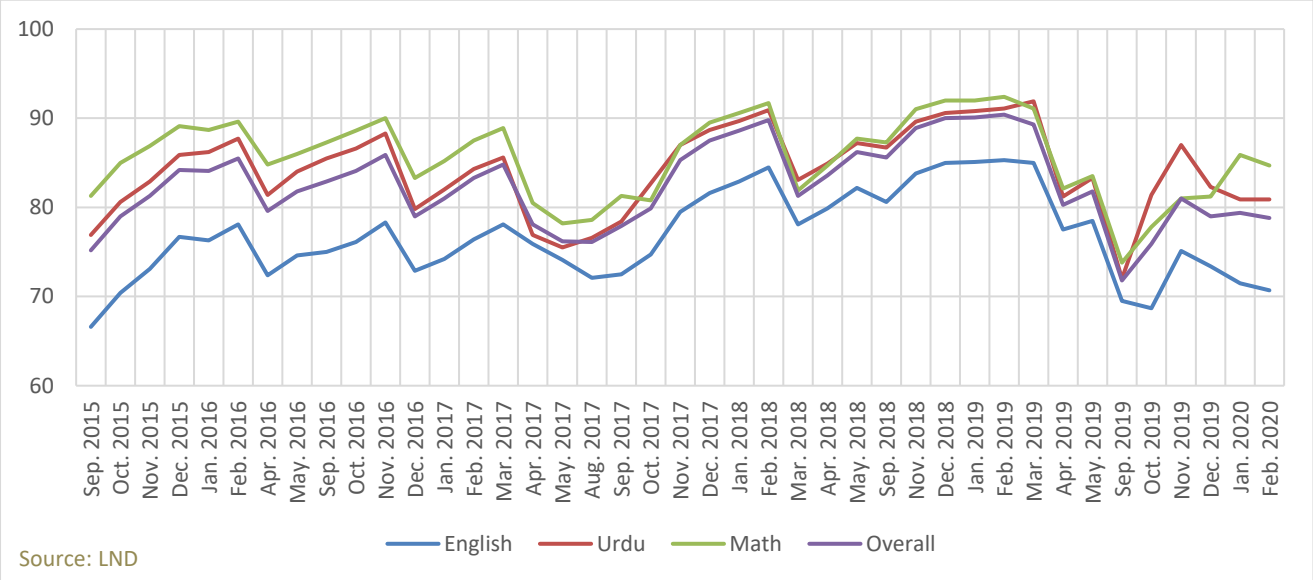


Table 27 Average school-level score (%), Grade 3 pupils, LND data by subject

		English	Urdu	Math	Overall
2015	Sep.	66.6	76.9	81.3	75.2
	Oct.	70.4	80.6	85.0	79.0
	Nov.	73.1	82.9	86.9	81.3
	Dec.	76.7	85.9	89.1	84.2
2016	Jan.	76.3	86.2	88.7	84.1
	Feb.	78.1	87.7	89.6	85.5
	Mar.	No data collected			
	Apr.	72.4	81.4	84.8	79.6
	May	74.6	84.0	86.0	81.8
	June	No data collected			

	July				
	Aug.				
	Sep.	75.0	85.5	87.3	82.9
	Oct.	76.1	86.6	88.6	84.1
	Nov.	78.3	88.3	90.0	85.9
	Dec.	72.9	79.8	83.3	79.0
2017	Jan.	74.2	82.0	85.2	81.0
	Feb.	76.4	84.3	87.5	83.3
	Mar.	78.1	85.6	88.9	84.8
	Apr.	75.9	76.9	80.5	78.1
	May	74.1	75.5	78.2	76.2
	June	No data collected			
	July				
	Aug.	72.1	76.6	78.6	76.1
	Sep.	72.5	78.4	81.3	77.9
	Oct.	74.7	82.7	80.8	79.9
	Nov.	79.5	87.0	87.0	85.3
	Dec.	81.6	88.7	89.5	87.5
2018	Jan.	82.9	89.7	90.6	88.6
	Feb.	84.5	90.9	91.7	89.8
	Mar.	78.1	83.1	81.9	81.3
	Apr.	79.9	84.9	84.7	83.6
	May	82.2	87.2	87.7	86.2
	June	No data collected			
	July				
	Aug.				
	Sep.	80.6	86.7	87.3	85.6
	Oct.	No data collected			
	Nov.	83.8	89.6	91.0	88.9
	Dec.	85.0	90.6	92.0	90.0
2019	Jan.	85.1	90.8	92.0	90.1
	Feb.	85.3	91.1	92.4	90.4
	Mar.	85.0	91.9	91.1	89.3
	Apr.	77.5	81.2	82.1	80.3
	May	78.5	83.3	83.5	81.8
	June	No data collected			
	July				
	Aug.				
	Sep.	69.5	72.0	73.8	71.8
	Oct.	68.7	81.4	77.8	75.9
	Nov.	75.1	87.0	81.0	81.0
	Dec.	73.4	82.3	81.2	79.0
2020	Jan.	71.5	80.9	85.9	79.4
	Feb.	70.7	80.9	84.7	78.8

Table 28 Average student-level score (%), Grade 3 pupils, DFID 6MA data, 2014

Sept. '14	English	Urdu	Math	Overall
Overall	61.5	50.1	65.3	59.2
School Type				
Government	61.5	50.1	65.3	59.2
School Level				
High	66.8	54.3	71.0	64.3
Middle	60.7	48.6	64.5	58.2
Primary	59.6	49.3	63.5	57.7
Mosque	42.3	27.0	40.7	37.0
School Gender[15]				
Female	66.6	57.2	68.3	64.3
Male	56.4	43.0	62.3	54.2

Note: Differences in average scores by school gender are significant at the 99.9% confidence level for all subjects. Aside from primary and middle, differences in average scores by school level are significant at the 99.9% confidence level for all subjects. More detail about the significance levels can be found in the data set specific annexure.

Table 29 Average student-level score (%), Grade 3 pupils, DFID 6MA data, 2018

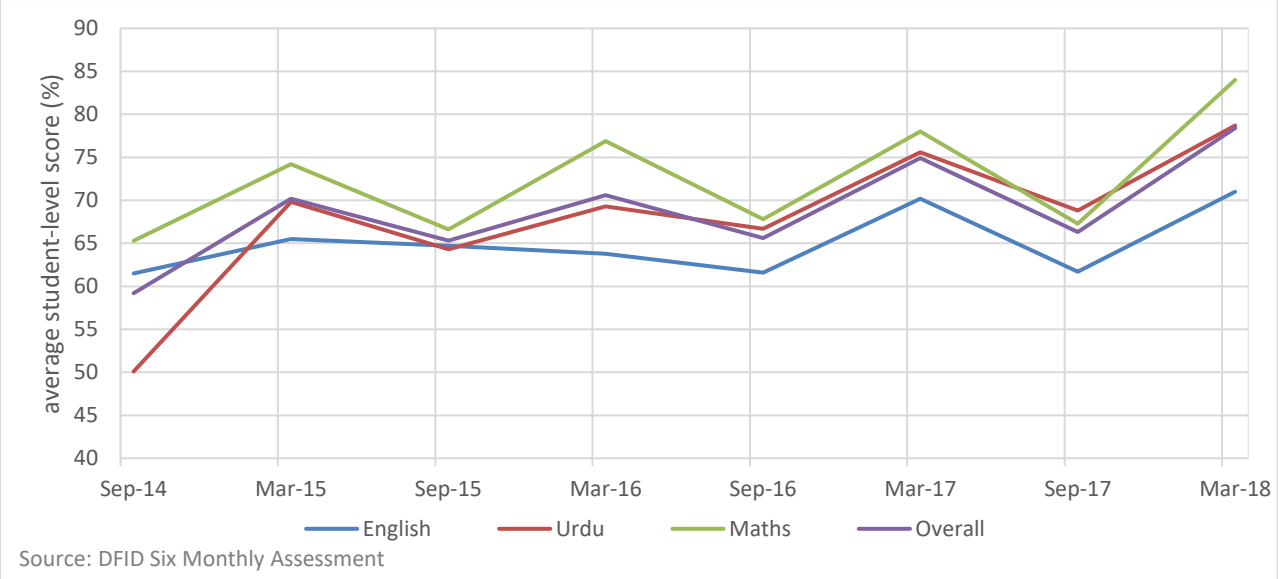
Mar. '18	English	Urdu	Math	Overall
Overall	71.0	78.7	84.0	78.4
Student Gender				
Female	73.2	81.9	83.0	79.7
Male	68.7	75.4	85.2	77.1
School Type				
Government	70.0	75.3	84.3	77.1
PEF	72.0	82.0	83.8	79.7
School Level				
High	67.1	73.3	82.1	74.8
Middle	69.6	75.5	84.7	77.2
Primary	72.7	76.8	85.8	79.0
School Gender				
Female	71.6	77.9	83.5	78.1
Male	67.8	71.6	85.3	75.6

Note: Differences in the average scores by school and student gender are significant at the 99.9% confidence level. Differences in the average scores by school type are significant at the 99.9% significance level with the exception of math which shows no significance. More detail about the significance levels can be found in the data set specific annexure.

[15] The school gender variable captures whether the school is officially a boys' schools or a girls' school. However, girls can attend boys' schools and vice versa, mainly at the primary level. The student gender variable distinguishes the analysis by gender – i.e. girls versus boys.

Figure 7 illustrates this marginal improvement in scores during the period for which data are available. Comparisons between September and March (of the following year) point to learning improvements over the school year.

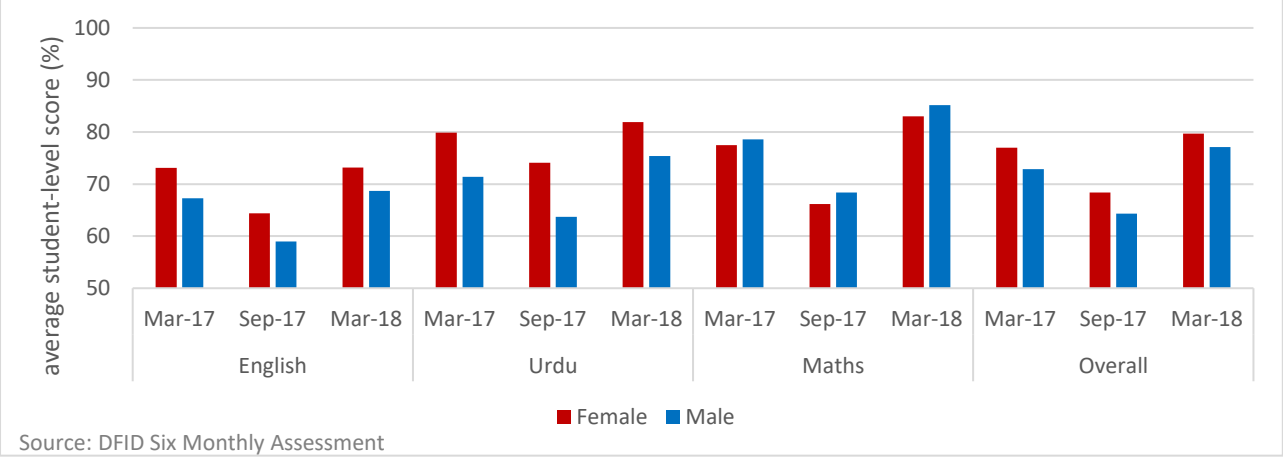
Figure 7 Average student-level score (%), by subject, DFID 6MA data



Data are not available across all disaggregations for all the years and in some instances only snapshots at a point in time are available rather than time trends over time. Figure 8, Figure 9 and Figure 10 graphically illustrate the student-average score by subject and pupil gender, by rural-urban location and by government versus Punjab Education Foundation (PEF) schools. Figure 8 illustrates that females outperform males in languages (English and Urdu) but not in Mathematics. These findings resonate with evidence from more rigorous studies within Pakistan (see for instance Aslam, Rawal and Jamil (2013)). Consistent with expectation, pupil outcomes are better in urban areas than rural areas, and PEF schools consistently outperform their government school counterparts across the different subjects (albeit to varying degrees). The SABER SD also finds that students in PEF schools learn more than those in public and private schools, in Urdu and Mathematics.

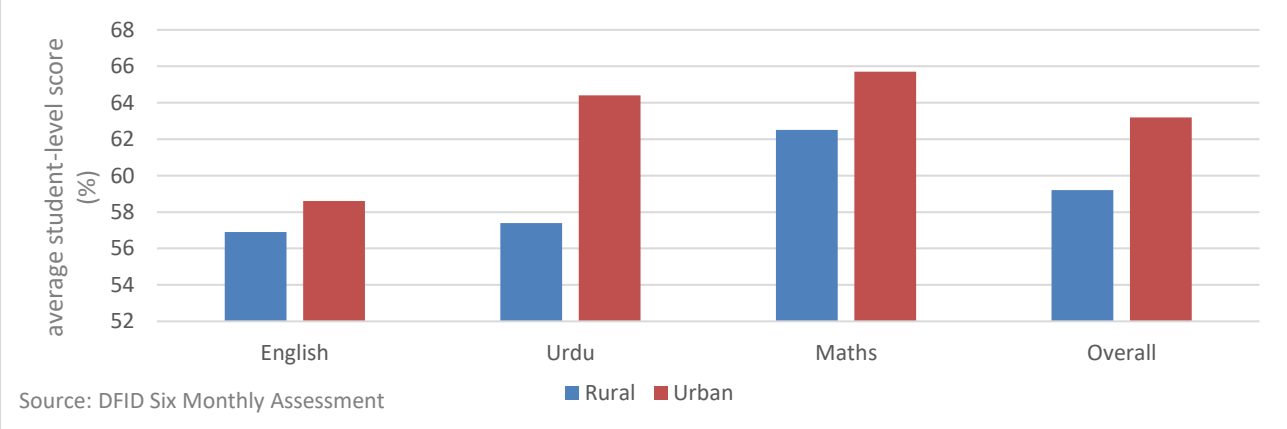
It is worth noting that these are simple raw average differences. More rigorous psychometric and statistical analysis is required to provide greater confidence that the differences in observed results are likely to be caused by underlying differences in skills and knowledge. This would require collecting additional variables – pupil characteristics, family background and school and teacher level variables within the data sets; data on learning outcomes to be collected from a random sample of pupils at baseline who are then 'followed' over time (to provide a longitudinal data set).

Figure 8 Learning outcomes by subject and student gender, DFID 6MA data



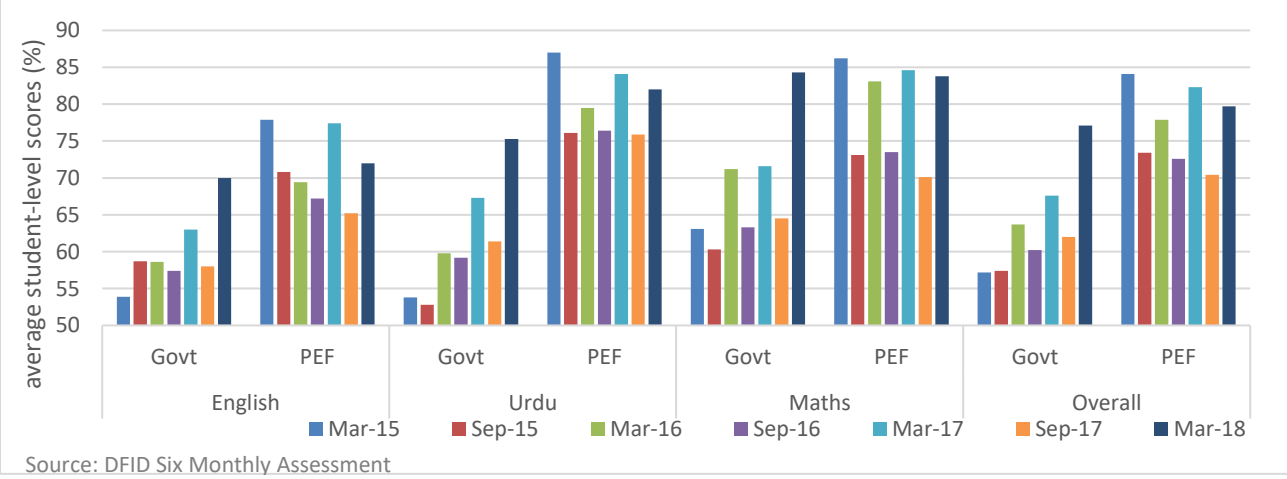
Note: Differences in average scores by gender are significant at the 99% significance level or above.

Figure 9 Learning outcomes by subject and location, DFID 6MA data, Sept. 2016



Note: Differences in average scores by location are significant at the 95% significance level or above.

Figure 10 Learning outcomes by subject and school type, DFID 6MA data



Note: Differences in average scores between government and PEF schools are significant at the 99.9% significance level across subjects and rounds.

Student Learning Objectives (SLO) analysis reveals improvements in certain competencies for pupils and also highlights those areas where further efforts are needed

The DFID 6MA data set records assessment scores by the student learning objectives (SLOs) that are tested under each subject. The tables below show the average score (percentage of right answers) by SLOs under each subject. In particular, Table 30 and Table 31 reveal across the board improvements in the various SLOs based on these averages. These tables also highlight those competencies in which pupils are particularly weak. For instance, in September 2014, students' knowledge of the alphabet was strong (91.4% correct on average), but they did not demonstrate the ability to read a text and comprehend its meaning (23.1% correct). Table 30 and Table 31 summarise the average score (%) by SLO as on September 2014 and March 2018 (see Annex H for all tables).

Table 30 Average student score (%) by SLO, September 2014

English		Urdu		Math	
Alphabet	91.4	Jor kay tor	61.4	Missing Numbers	91.9
Spelling	73.0	Tor kay jor	36.5	Addition	57.6
Picture Word	54.1	Picture Recognition	49.8	Fractions	63.6
Sentence Completion	45.9	Sentences	52.5	Subtractions	40.9
Comprehension	23.1	Comprehension	50.1	Multiplication	63.8

Table 31 Average student score (%) by SLO, March 2018

English		Urdu		Math	
Alphabet	96.4	Jor kay tor	88.4	Missing Numbers	93.3
Spelling	76.0	Tor kay jor	70.3	Addition	89.1
Picture Word	81.7	Wahid Jama	72.0	Fraction	92.8
Sentence Completion	59.6	Picture Recognition	87.7	Subtraction	75.5
Comprehension	44.3	Muzakkar Monus	70.1	Multiplication	90.7
		Sentences	84.4	Time	77.6
		Comprehension	78.0	Division	81.7
				Word Problem	60.5

The SABER Service Delivery (SD) study also conducted a school based assessment, following the LEAPS study assessment, in 2018. Children in Grade 4 were tested over Grade 1 to Grade 4 levels in Math, English and Urdu. The preliminarily findings from SABER SD create a 'Curriculum Adjusted Years of Schooling' (CAYS) metric which adjusted schooling based on the curriculum Grade 4 students are able to master in an assessment, to understand the link between schooling and learning. Assuming a passing rate of 33%, if a child is able to pass 33% of the Grade 1 curriculum but not the Grade 2 curriculum, regardless of the years of schooling, that child is at 1 year of CAYS. Children in Grade 4, on average, are only able to master the Grade 2 curriculum with girls two months ahead of boys in the curriculum. Across subjects, students are able to complete basic order tasks but struggle with more difficult domains, such as fractions and grammar, findings also evident in the Six Monthly Assessment. Ultimately, they argue that students are learning in school but just at a slower rate.

Box 1 provides information on learning outcomes from PEC assessments for Grade 5 and Grade 8 pupils.

Box 1 Pupil Learning Outcomes PEC Assessments

Punjab Education Commission (PEC) Assessments at the Grade 5 and 8 Levels – what does secondary data report during the years? 2010-2019

This Box reports the key findings from secondary data available from the PEC reports and provide a brief analysis of learning outcomes for Grade 5 and 8 pupils in the Punjab as reported by PEC in their reports.

PEC is an autonomous body set up by the Government of the Punjab in 2005 to conduct annual assessment for Grade 5 and 8 students in the province with the view that these grade levels are crucial progression points to secondary and higher secondary education. Therefore, these examinations are intended to promote students across these grade levels and they are intended to provide the government rich data to identify pupils' learning over the years (PEC, 2016). This Box summarises some of the key findings from the 2010, 2016 and 2019 reports from the PEC website.

According to the 2010 report private schools have outperformed public schools across Grade 5 and Grade 8. However, in 2016, there is only a minor difference between public and private schools, and private candidates are performing the lowest in Grade 5 and Grade 8. In 2019, public school students are performing better in Grade 5 while private school students are performing better in Grade 8.

When looking at trends dissected for gender and subject at the 5th grade, the 2010 report shows boys performing better at maths than girls. Girls performed marginally and significantly better in other subjects. This trend of girls performing better is persistent in 2016 and 2019 at the Grade 5 level. The exception to this is Mathematics, where there is no difference in the mean score between boys and girls in 2016 and 2019, which show girls' performance trajectory improving over time.

Not observing large improvements in learning outcomes over a relatively short period does necessarily imply failure

LND and DFID 6MA data have revealed some improvements in learning outcomes over the periods for which the data are available. SLO-wise analysis using DFID 6MA data has shown substantial improvement in certain competencies during the period. There are two points worth emphasising here. Firstly, observing true impact on learning outcomes requires observing learning outcomes, ideally of the same child, over at least a few years as improvements in learning outcomes are cumulative (with the impossibility of undoing 'lost years' or even years of poor learning). Secondly, many children in Pakistan start from very low levels (i.e. may not be well-prepared for school) something that the ASER data below are particularly useful in highlighting. Finally, learning outcomes depend on factors outside of the school as well as those within the school. Generally, it is more difficult for children from poorer or more marginalised groups to make progress in school. Therefore, if the profile of the children enrolled in school changes because more marginalised groups are able to access schooling, we would expect learning outcomes to decrease if the quality of schooling remains constant. Observing small improvements in learning outcomes, while increasing access for poor and marginalised groups therefore represents improvements in quality. This interpretation of results is dependent on the profile changing and, crucially, on the changes to the profile of students enrolled in school being reflected in the samples that are tested.

4.3.2 Learning outcomes and socio-economic factors

ASER findings paint a picture of persistently low learning outcomes in rural Punjab with low wealth emerging as a clear marker of disadvantage especially for girls

ASER sample survey (2012-2019) provides another source of information on learning assessments. There are some key differences between this data set and the ones discussed above:

- ASER is a mainly rural data set and whilst it provides coverage over all districts in the Punjab during the evaluation period (2012-2019), the findings mainly reflect rural settings. Although some urban areas have been sampled in ASER during the course of the years, the data set retains its rural emphasis.

- This data assesses children *in their household* and, unlike the school-based assessments discussed above, assesses all children in any given household who are aged between 5-16 years and assesses them on basic literacy and numeracy (based on up-to Grade 2 curriculum). The assessments are individually administered by trained volunteers and are unlike the assessments administered at the school-level and school setting discussed above.

- Assessments are conducted in Literacy/Reading, Mathematics and English and in each subject the participants are graded on a five-point scale depending on the tasks they are able to complete (see Table 32 below). Statistics in this section provide percentages of children aged 5-16 years that are able to complete each level.

This analysis focuses more closely on reading and mathematics outcomes. For ease of reporting the learning outcomes at two extremes are discussed. At one end, there is the situation where a child is a complete beginner – they are able to read 'nothing' in language or they are unable to identify numbers 1-9. At the other end there is the situation where the child demonstrates the highest order skills that are tested by the assessments – they are able to read a story (highest competency in reading assessments) or do a division sum in mathematics assessments. The analysis using ASER data focuses on children aged 5-16 years in Punjab only (unless regional comparisons are made). Detailed statistics – learning levels over selected variables, gender disaggregated tables and provincial comparison tables – are presented in Annex E.

Table 32 Learning assessment grading in ASER

Levels	Reading	Mathematics	English
1	Beginner (child is not able to complete below tasks)		
2	Recognition of alphabet/ letters	Number recognition [1-9]	Recognition of capital letters
3	Recognition of words	Number recognition [10-99]	Recognition of small letters
4	Reading sentence/ paragraph	Number recognition [100-200][16]	Reading simple words
5	Reading story	Subtraction	Reading sentences
6		Division	

Learning outcomes have shown some recent improvement but a large number of children in (mostly rural) Punjab of school-going age do not have basic reading and numeracy competencies

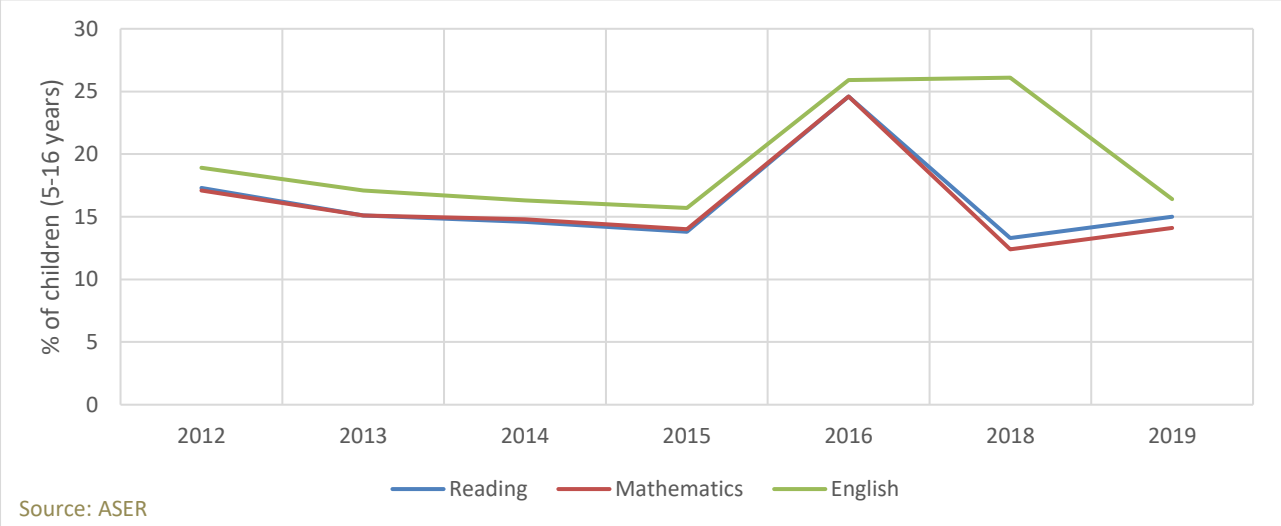
These findings are apparent in the tables presented in the Annex E and summarised in

Figure 11 below. It is clear from this graph that a large percentage of children aged 5-16 years in the Punjab are able to read 'nothing' (i.e. unable to recognise alphabets), recognise any numbers (1-9)

[16] This level was introduced in 2018 onwards.

or recognise any English alphabets when they are assessed. It is worth noting that the assessments are aimed at assessing only very basic literacy and numeracy competencies (with at most Grade 2 curriculum competencies assessed amongst the higher order skills) and many children are unable to achieve even at this very low level of competence. A further aspect is that there seem to have been only slight improvements (after a decline in learning outcomes in 2016) indicating that not only are basic learning levels low in the Punjab, they are persistently low according to this data set.

Figure 11 Children unable to read anything or identify any number (%)

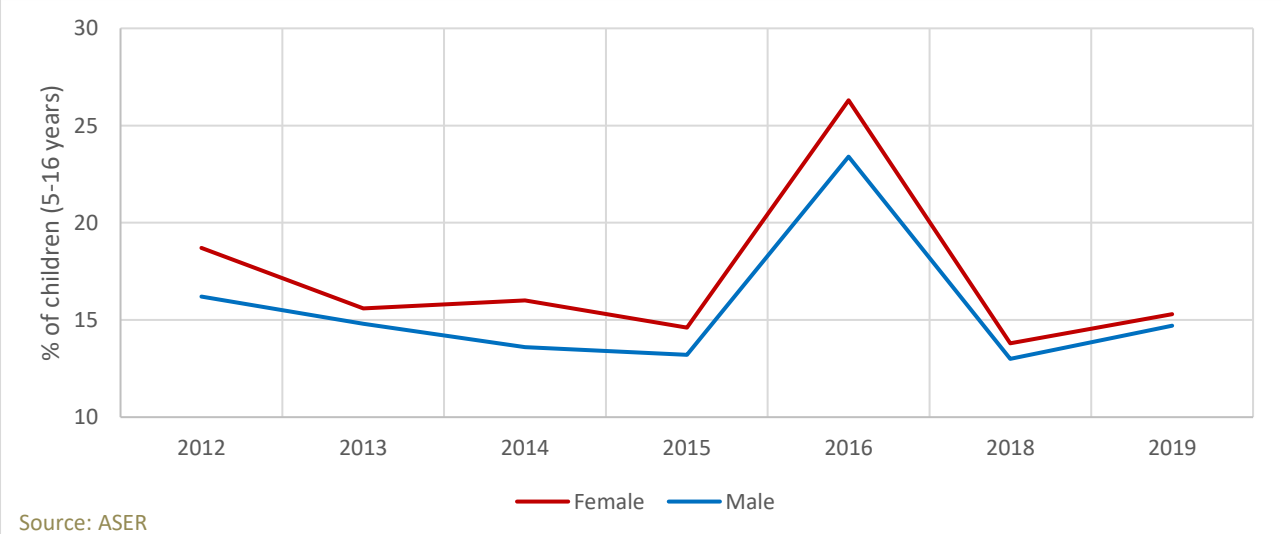


Source: ASER

There are clear differences in the learning outcomes between poor and rich in rural Punjab

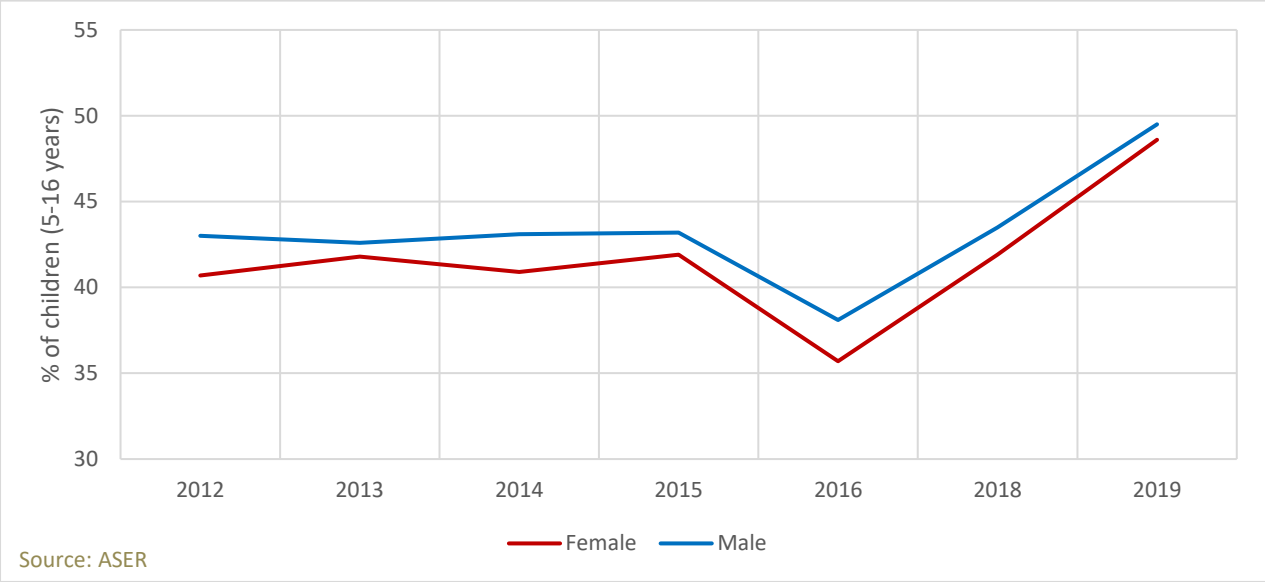
There are few visible differences in learning outcomes between boys and girls. A slightly larger percentage of girls than boys aged 5-16 years are able to read nothing and a slightly larger share of boys than girls are able to perform higher order skills – read a story – but whether these differences are statistically significant has not been determined (Figure 12 and Figure 13).

Figure 12 Children unable to read anything (%), by gender



Source: ASER

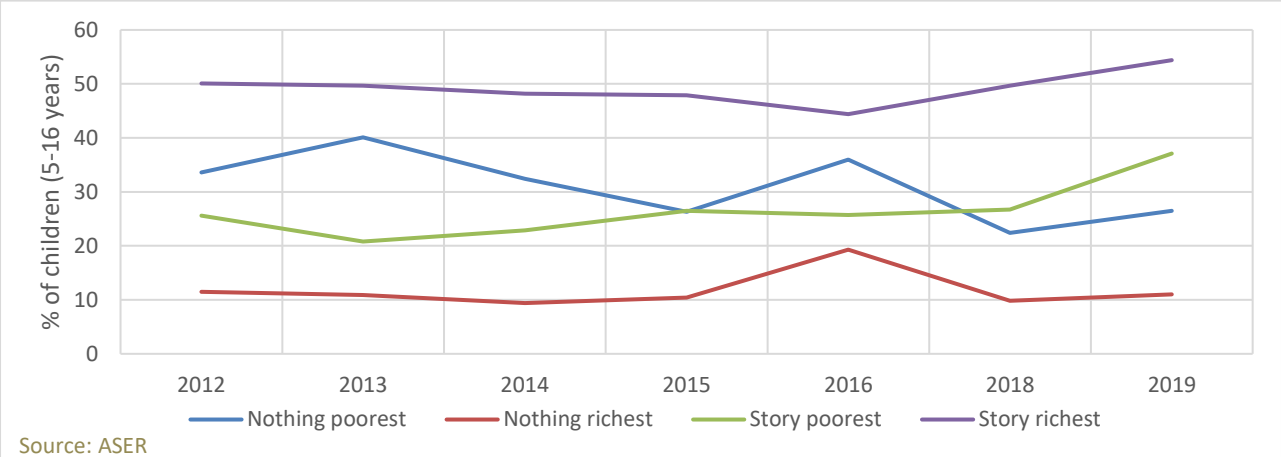
Figure 13 Children able to read a story (%), by gender



As has been reported extensively in various ASER reports (2012-2019) during the years and in more rigorous work using this data set, there are very clear differences in the learning outcomes by SES. Figure 14 and Figure 15 illustrate the raw achievement gaps between the poorest and richest children in: 1) their ability to read 'nothing' versus read a 'story' and 2) their inability to even recognise numbers 1-9 (hence 'nothing') versus their ability to do the highest competency in mathematics i.e. divide. The poorest child is one who falls into the lowest income quintile and the richest one who falls in the highest (see Annex K). It is apparent from both graphs that there are wide gaps between the rich and poor in their learning levels. The poorest children are more likely to be able to read nothing or be unable to identify digits 1-9 in mathematics. On the other hand, substantially lower proportions of rich children fall into this no-achievement category. Conversely, rich children, are much more likely to be able to achieve the highest order skills – being able to read a story/paragraph in the reading assessment and being able to answer division questions in a mathematics one. It is also worth noting that over time, the gap between the richest and poorest has only slightly narrowed in literacy. Figure 14 and Figure 15 also illustrates these findings in a different way – suggesting that children belonging to the richest quartile have the highest learning levels in Urdu/Sindhi/Pashto, English, and Arithmetic whereas the children in the poorest quartile have the lowest learning levels.

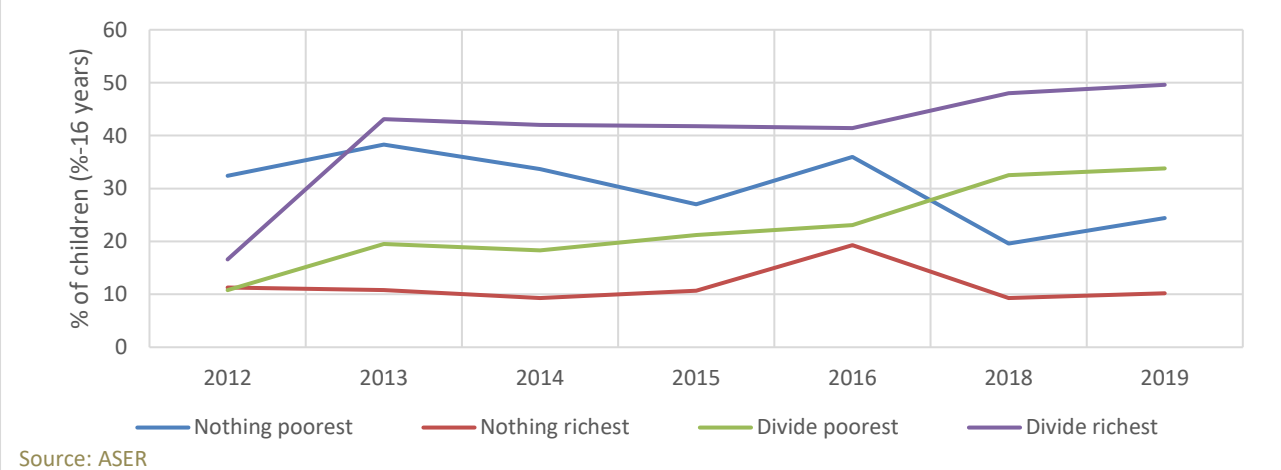
These findings resonate with previous evidence. Rose (2015), for example, notes that the ASER data show that wealth remains one of the largest predictors of pupil learning in Pakistan. Interestingly, she notes that wealth is a far greater predictor of achievement than whether a child attends government or private school – more rich children in government schools appear to be learning than poor children in private schools. Within both government and private schools, poorer children are found to be three times more likely to be unable to read a paragraph than richer children in the same type of school. Rose (2015) argues that analysis of the ASER data from Pakistan 'alerts policymakers to focus their attention on government schools given that this is not only where the majority of the poorest children are studying, but also where learning levels are lowest.' That being said, the trends over time point towards some improvements in outcomes for the poorest quintile and for all children in numeracy (i.e. more children are now able to divide).

Figure 14 Achievement gaps in literacy (%), by SES



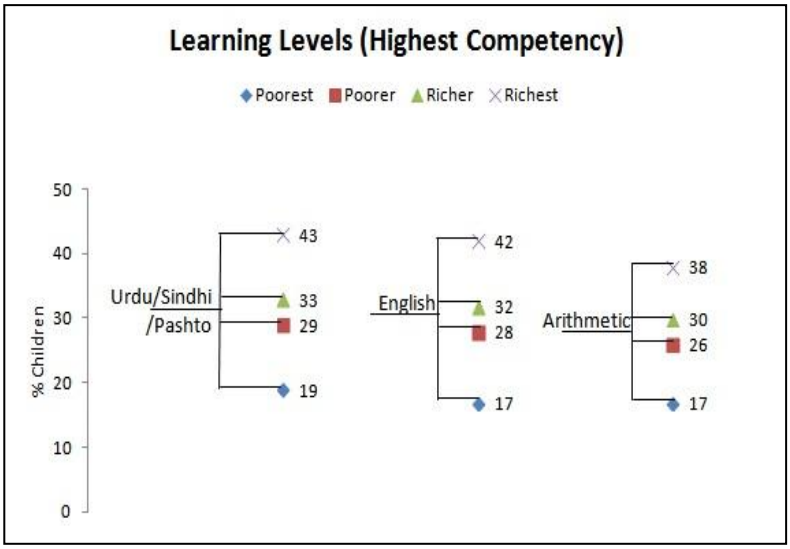
Source: ASER

Figure 15 Achievement gaps in numeracy (%), by SES



Source: ASER

Figure 16 Higher order competency levels by SES, ASER (2016) rural data



Source: Aslam et al. (2018). ASER data are scaled in such a way to code 'highest' competencies – the maximum competency being assessed a child can do based on grade katchi-2/3 curriculum. This is being able to read a story (Reading in any language), being able to divide (Mathematics) or being able to read sentences (English).

These trends are also evident in the MICS 2017 survey which contain household based assessments for children 7-14 years in both urban and rural Punjab. Similar to the other assessments, children are tested on Grade 2-3 competencies. Children belonging to the richest households perform much better than those belonging to the poorest households in both literacy (Figure 17) and numeracy (Figure 21), and over different tasks. Since this data set covers both rural and urban areas, this also provides an insight into disparities by geography. Figure 19 shows that children in urban areas, particularly in terms of literacy, outperform their peers in rural areas.

Figure 17 Children who successfully completed literacy tasks (%), by SES

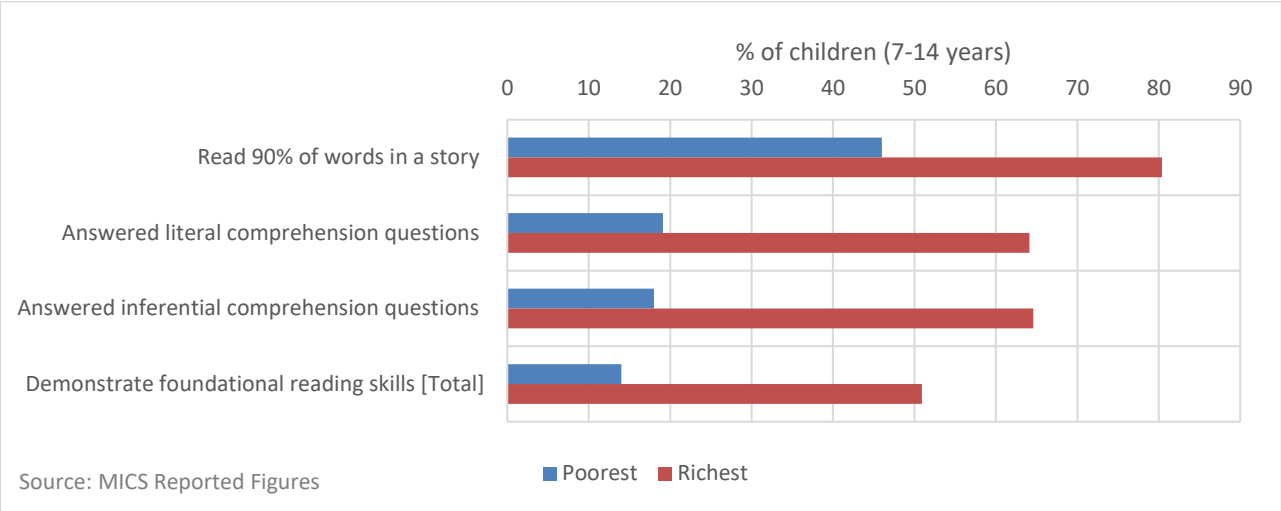


Figure 18 Children who successfully completed numeracy tasks (%), by SES

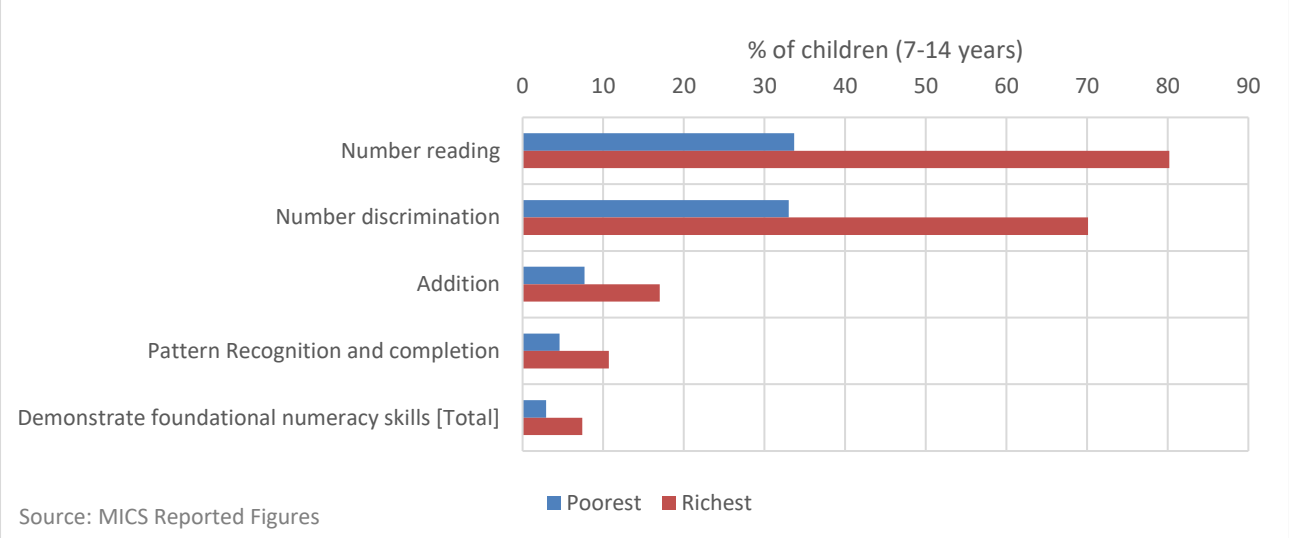
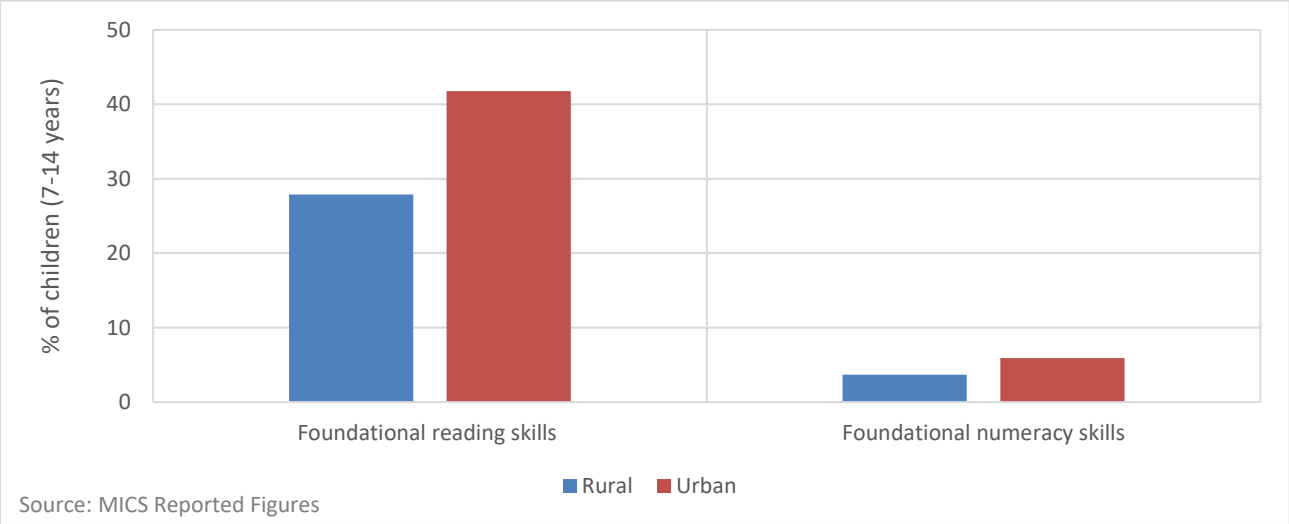
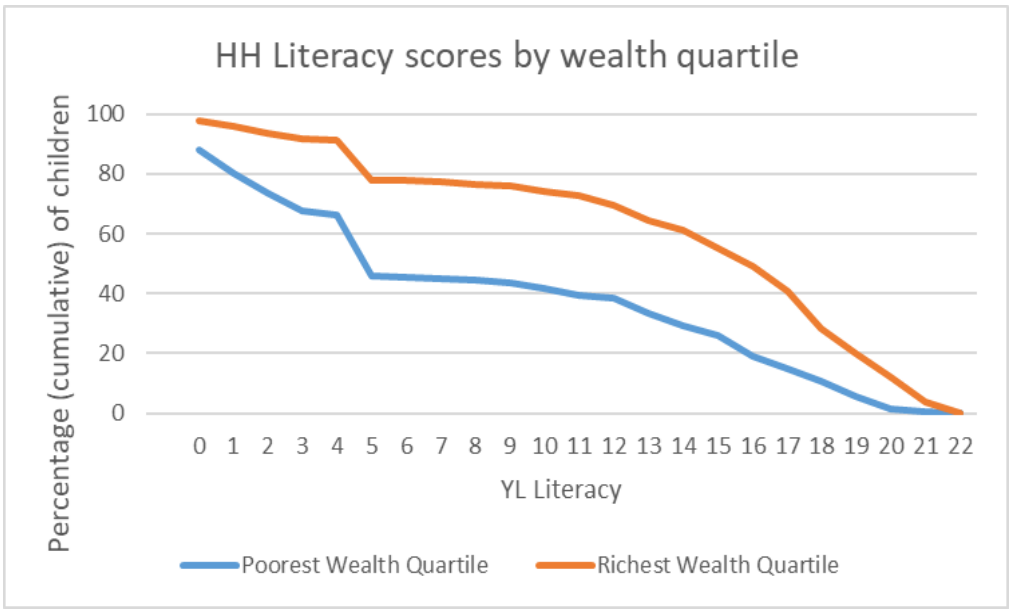


Figure 19 Children with minimum literacy and numeracy skills (%), by urban/rural



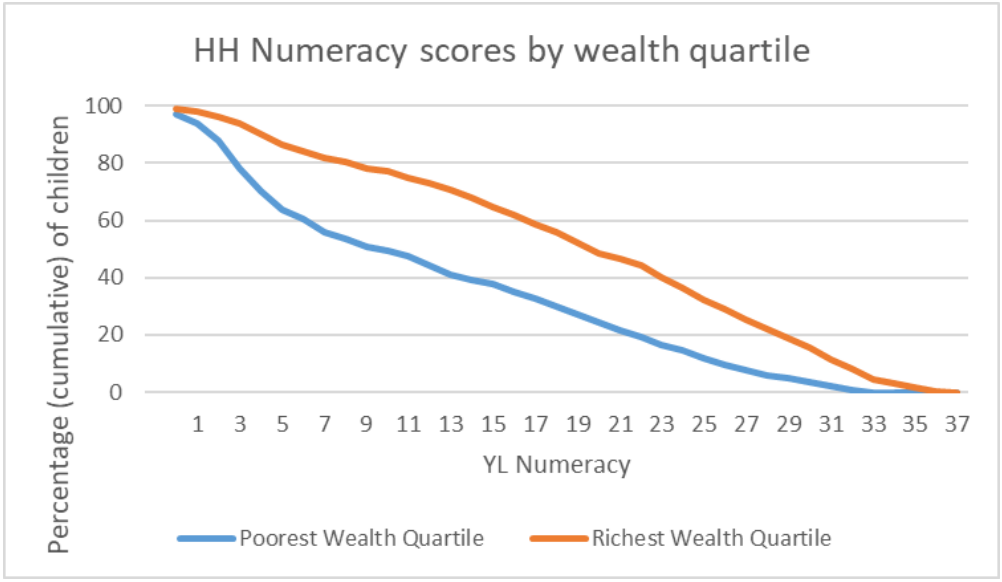
Since the TEACh project has collected very rich data from three districts in central Punjab, this report discusses the findings that relate to the evaluation and that are in the public domain. This rural data set also appears to confirm the evidence from the much larger-scale ASER data set – that wealth appears to be an important determinant of child literacy and numeracy in rural Punjab with richer children (aged 8-12) performing better than poorer children in the same age group in both literacy and numeracy outcomes (Figure 20 and Figure 21).

Figure 20 Pupil literacy scores (household data) by SES, ages 8-12 years



Source: TEACh data 2016-2017

Figure 21 Pupil numeracy scores (household data) by SES, ages 8-12 years



Source: TEACh data 2016-2017

The additional advantage of the data set collected under the TEACh project is that it assessed pupils in Grades 3 and 5 in schools at the beginning and the end of the school year. By doing so, the project aimed to identify the within and across school differences in the quality of teachers and teaching in a bid to investigate the main barriers to equitable teaching and learning in rural government schools in the Punjab. More specifically, the project aimed to identify whether differences in achievement levels of marginalised children are due to these children clustering in particular types of schools or due to differences in teaching they face within the school they attend. Recent analysis (Aslam et al., 2019) reports that when SES is controlled for in multivariate models of child achievement, only a child's prior achievement appears to remain important in determining learning progress. In other words, after controlling for SES in regression analysis (learning outcomes regressions), research finds poor children do badly and poor children who start low (in terms of achievement) also remain persistently low during their learning experience in the school year. More specifically, progress during the school year is not significantly correlated to SES or other demographic variables for numeracy. In literacy, however, students from low SES households also make less progress during the school year. The research also finds evidence to suggest that pupils cluster into school based on their socio-economic backgrounds with poorer children clustering together into schools[17]. These more robust data analyses appear to corroborate the crucial role of wealth and SES for children in rural Punjab.

While the poorest girls in the Punjab are performing the worst and remain the most marginalised, there have been some recent improvements

The findings show marked differences between genders regarding the relationship between wealth and learning outcomes. Whilst no obvious differences were apparent by gender, there are obvious learning gaps when distinguishing between the richest and poorest girls versus the richest and poorest boys. Figure 22 and Figure 23 below depict that poorest girls are the most disadvantaged group in that they are substantially more likely not to be able to read anything (and equivalently less likely to be able to read a story) as compared with both richest girls and boys, but also compared to

[17] Findings presented by Monazza Aslam at the CIES 2018.

the poorest boys. It is also very clear that there are no such gaps between richest girls and richest boys. Low wealth therefore appears to have a greater negative impact on the learning outcomes of girls than it does for boys. There have been some improvements – the gap between poorest girls and poorest boys has diminished in 2018-2019. Furthermore, the gap between the poorest quintile and the richest quintile, while persistent, has narrowed over time.

Figure 22 Children unable to read anything (%), by gender and SES

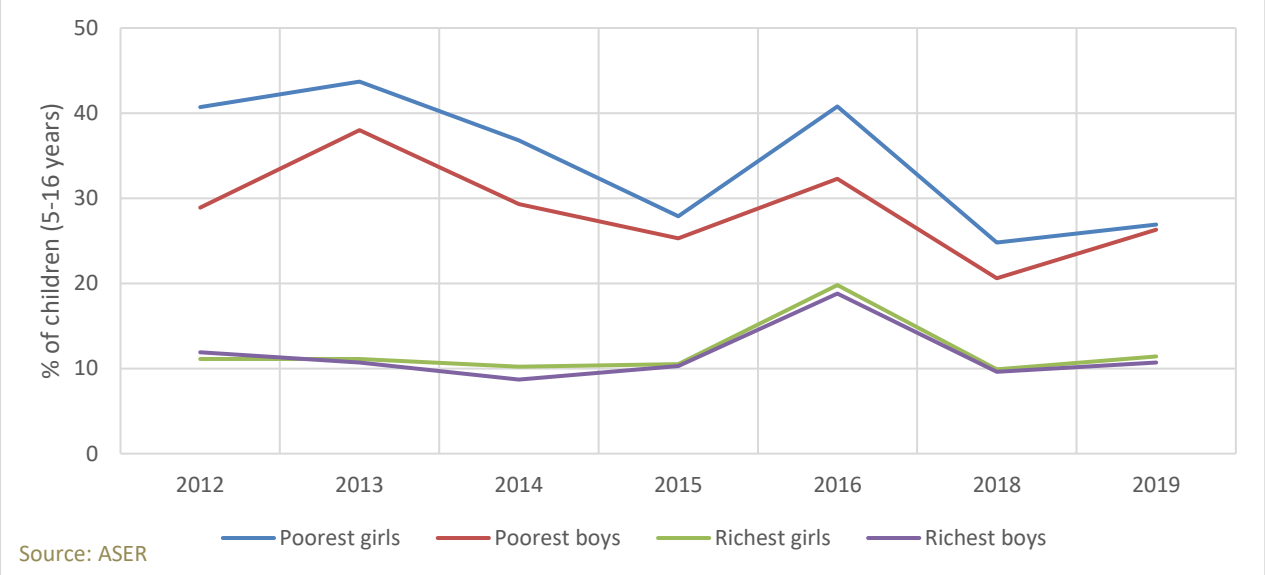
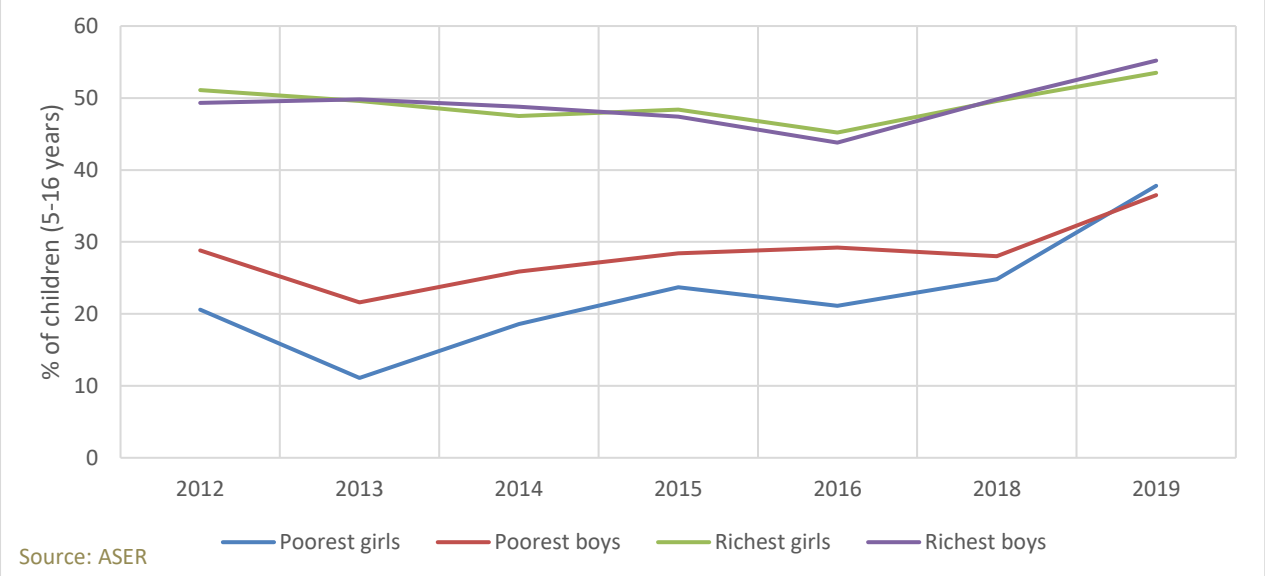


Figure 23 Children able to read a story (%), by gender and SES



Box 2 provides evidence that maternal literacy has an important positive impact on children's learning outcomes.

Box 2 Evidence from MICS data – Role of mother's education

Punjab MICS 2017/2018 introduced a household assessment which tested children 7-14 years on Grade 2 and 3 minimum proficiencies in reading and mathematics. Since this survey gathers extensive data on women, reported figures provide assessment scores by mother's education and functional difficulty.[18] Mother's education plays a crucial role in the performance of children, particularly in reading. Around 24% of children with illiterate mothers demonstrate foundational reading skills in comparison to 53.1% of children with mothers who have more than secondary (Grade 10) education. The gap by mother's literacy is more pronounced for girls (difference of 32.5 percentage points) in comparison to boys (difference of 25.9 percentage points). In terms of mathematics, around 3.5% of children with illiterate mothers demonstrate foundational numeracy skills in comparison to 9.9% of children with mothers who fall in the highest education category. On the other hand, reported skills do not differ by mother's functional difficulty. These results point to the crucial role of parental education in Punjab.

4.3.3 Disability and learning outcomes

Children with disability are lagging behind on learning outcomes

As discussed in the previous section, improvement in schooling for children with disabilities has been slow. ASER's household assessment can also be disaggregated by disability level as shown in Table 33. Gaps by disability level are evident among children who are unable to read and children who are able to read a story, particularly in 2015. Interestingly, these statistics also show the difference between children with no disabilities and children with mild to moderate or severe disabilities is decreasing between 2015 and 2016 in terms of literacy (similar trends exist for numeracy, tables in Annex E). It is important to note that statistics for children with severe disability have to be reviewed with caution due to low number of observations.[19] According to TEACh data, 8-12 year olds with moderate to severe disabilities have lower learning outcomes than those without disability in literacy and numeracy, even when background factors are taken into account (Malik et al., 2020)[20]. The main takeaway here is that children with mild to moderate disabilities, which fall under the prerogative of the School Education Department, as also falling behind in terms of learning outcomes.

Table 33 Achievement in literacy (%), by disability

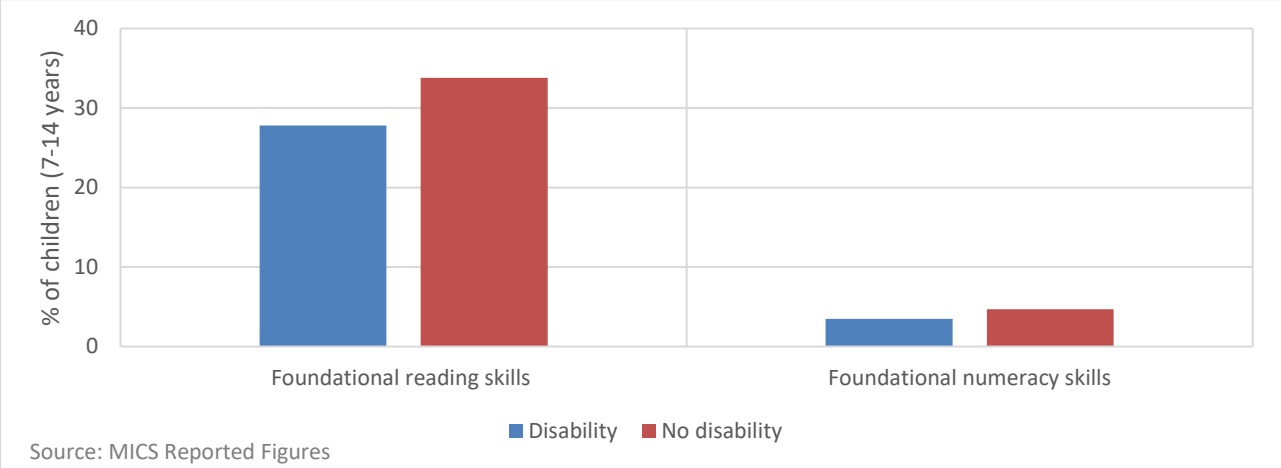
% of children who cannot read, 5-16 years			
Years	None	Mild to moderate	Severe
2015	14.2	21.8	61.0
2016	24.6	22.6	41.0
2018	13.2	15.6	18.5
% of children who can read a story, 5-16 years			
	None	Mild to moderate	Severe
2015	43.0	34.0	7.6
2016	37.3	35.0	17.9

[18] MICS 2017-18: Survey Findings Report
[19] Overall only 118 (out of 155), 39 (out of 306), and 27 (out of 174) children with severe disabilities attempted the reading test in 2015, 2016 and 2018, respectively in ASER. In comparison 1,540 (out of 1,911), 1,132 (out of 1,236) and 1,016 (out of 1,145) children with mild to moderate disabilities attempted the reading test in 2015, 2016 and 2018, respectively.
[20] When using ASER assessment data from TEACh.

2018	43.0	37.8	22.2

Reported figures from the MICS 2017, which code child functional disability on a binary scale also show that performance of children with disabilities is lagging. As Figure 24 shows, this gap is more evident in reading than in arithmetic for children 7-14 years. A nuanced understanding of disability is necessary to better cater to the learning needs of this age group.

Figure 24 Achievement in learning outcomes by disability



Source: MICS Reported Figures

4.3.4 Learning outcomes and schooling

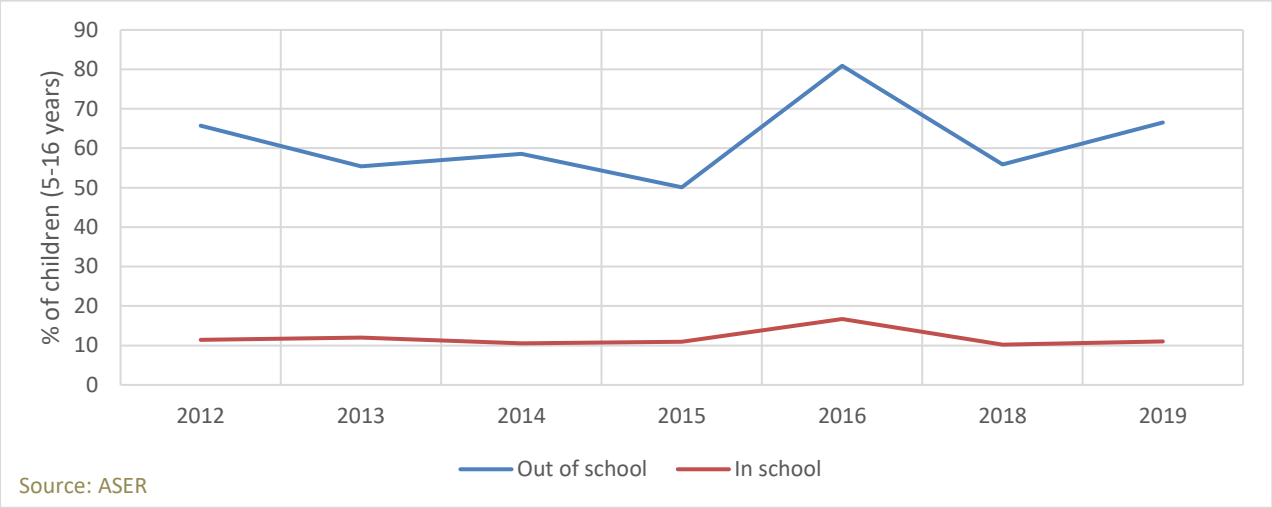
Even in poor quality education systems children learn more in school than out of it and Punjab is no exception

The positive relationship between schooling and learning persists (WDR 2018). Getting children into schools, improves their chances of learning and this is clearly the case in the Punjab. Children in school learn more than those who are out of school. This is reflected in Figure 25 below, which depicts the fact that children aged 5-16 years who are in school are substantially less likely not to be able to read 'nothing' as compared to children who are out of school. Equivalently, in-school children are more likely to be able to read a story as compared to those who are out of school (

Figure 26). Getting children into schools forms the very first step to their learning. Ensuring they are motivated to learn is another (WDR 2018). These findings are corroborated by TEACh (

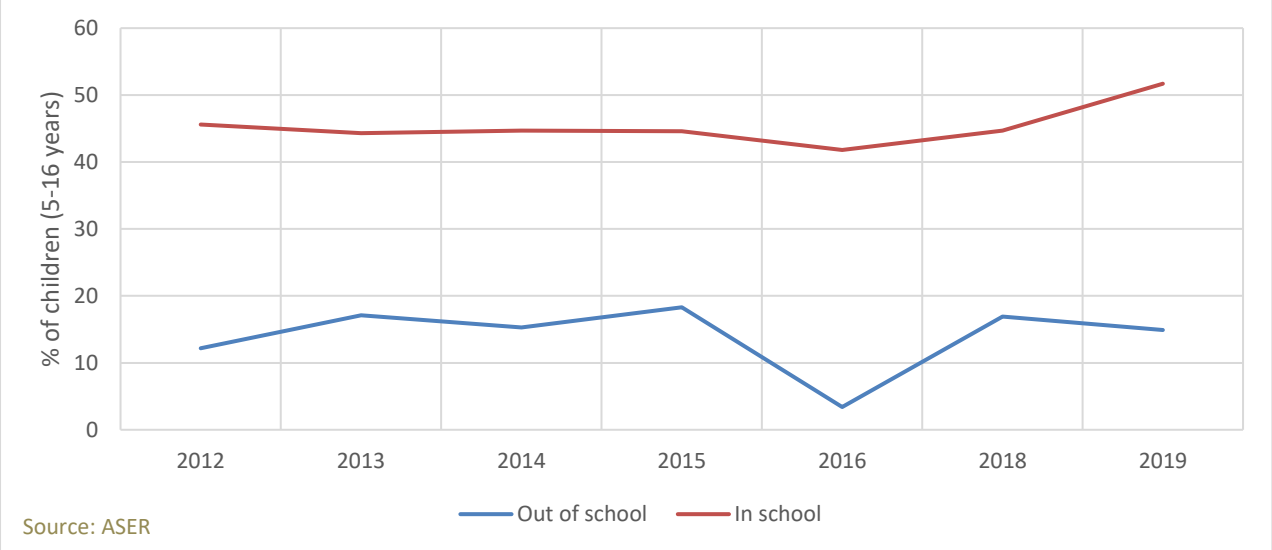
Figure 27). TEACh data also finds that the learning gap between children with and without disabilities is smaller if they are in school, using the ASER assessment (Malik et al., 2020). However, learning levels even for children who are in school remain low.

Figure 25 Children unable to read anything (%), by school participation



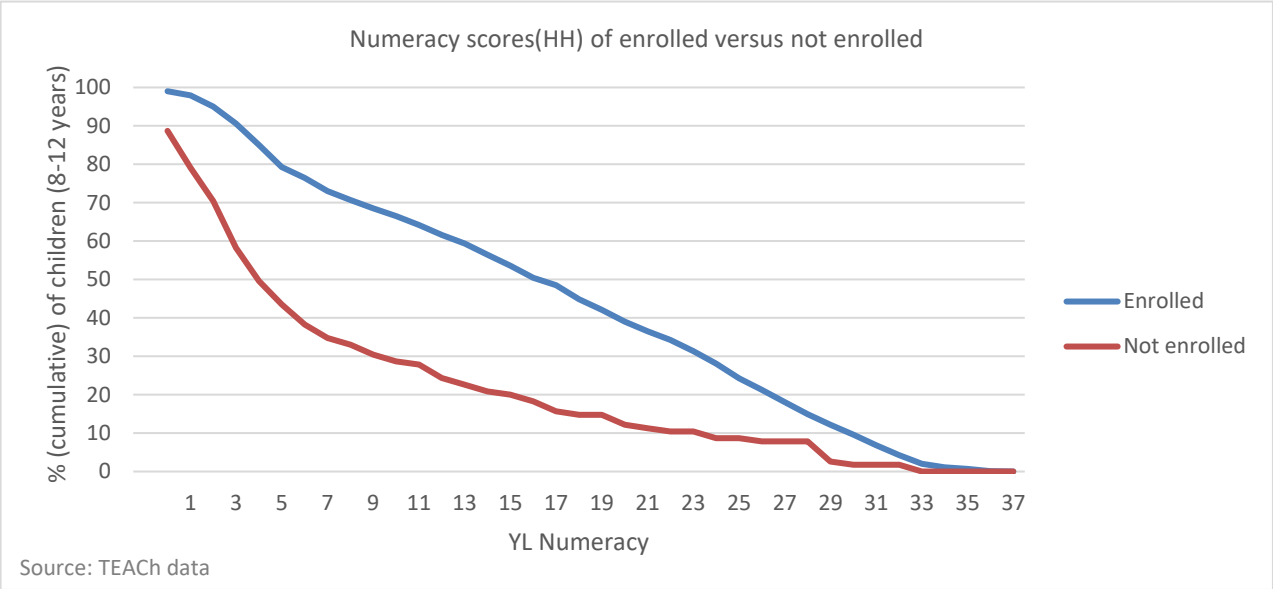
Source: ASER

Figure 26 Children who can read a story (%), by school participation



Source: ASER

Figure 27 Achievement gaps by school participation



4.3.5 Comparing learning outcomes across provinces

While (rural) Punjab's children have performed above the national average as compared to other provinces and regions in the country, overall achievement levels in the province remain persistently low

Table 34 and
Table 35 below illustrate the findings that in comparison with other provinces/regions, Punjab has performed above the national average. For example, 17.3% children aged 5-16 years were unable to read anything in the Punjab in 2012 as compared to a national average of 24%. There are wide disparities between regions with Islamabad showing the 'best' learning outcomes with only 7.2% assessed children reported as being unable to read anything compared to 34.5% reportedly unable to read anything in Balochistan in the same year.

Punjab has not shown much improvement over time. There are declines in learning outcomes in 2016 (although this has been observed almost entirely across the country). In the lower half of Table 34, which depicts the percentage of children aged 5-16 years who achieve the highest order skill competencies assessed in the reading assessment, it is evident that only between 2018 and 2019 did the percentage of children able to read a story increased. Between the same years, however, the number of children that are unable to read increased. The same trend, percentage increases in two extreme achievement levels in also evident for arithmetic in 2018-2019 (Table 35).

Punjab's children have tended to perform well above the national average in this competency. Whilst there have been slow improvements during the period for which data are available, learning outcomes in the Punjab are low despite numerous reforms and ongoing efforts in the province.

Table 34 Children's literacy achievement by province (5-16 years)

	% of children who can read 'nothing' aged 5-16 years								
Years	Punjab	Sindh	Balochistan	KPK	GB	AJK	Islamabad	FATA	National
2012	17.3	33.7	34.5	19.5	15.5	7.6	7.2	27.8	24.0
2013	15.1	27.1	27.6	14.1	13.8	7.1	14.8	19.8	19.4
2014	14.6	21.8	27.1	12.9	13.0	8.7	4.9	15.2	18.1
2015	13.8	22.4	27.5	12.1	15.0	7.7	5.0	17.8	18.1
2016	24.6	30.3	37.1	27.1	26.8	6.8	10.0	29.3	27.8
2018	13.3	18.9	26.4	14.6	12.1	6.9	19.8	25.8	18.1
2019	15.0	26.0	35.2	25.4	31.1	11.2	7.0	33.0	25.5
	% of children who can read a story aged 5-16 years								
	Punjab	Sindh	Balochistan	KPK	GB	AJK	Islamabad	FATA	National
2012	42.0	18.8	17.8	31.6	36.7	47.6	49.0	20.4	29.9
2013	42.2	23.2	19.8	30.5	32.0	47.3	39.4	22.8	30.4
2014	42.2	27.5	16.2	29.5	35.9	44.3	43.5	25.8	30.0
2015	42.7	27.0	17.6	33.5	38.4	51.7	59.0	27.5	32.0
2016	37.0	17.1	15.0	27.5	31.4	62.1	46.7	19.3	27.6
2018	42.8	22.9	14.0	36.6	40.0	55.5	48.5	22.2	30.9
2019	49.1	27.6	21.1	29.5	32.7	51.9	47.7	16.2	32.3

Table 35 Children's numeracy achievement by province (5-16 years)

	% of children who cannot identify numbers 1-9 aged 5-16 years								
Years	Punjab	Sindh	Balochistan	KPK	GB	AJK	Islamabad	FATA	National
2012	17.1	38.7	34.5	18.9	15.7	8.3	7.6	25.9	24.5
2013	15.1	29.6	25.0	12.9	13.5	6.9	13.9	14.9	18.7
2014	14.8	23.7	25.7	11.8	11.7	8.7	1.6	13.9	17.8
2015	14.0	24.2	24.8	11.5	14.1	7.7	4.9	15.3	17.5
2016	24.6	31.6	35.3	27.4	25.7	5.7	10.7	27.8	27.4
2018	12.4	18.9	20.2	11.9	9.8	6.0	18.4	20.7	15.4
2019	14.1	26.5	34.7	22.8	28.7	10.8	1.8	35.8	24.8
	% of children who can divide numbers aged 5-16 years								
	Punjab	Sindh	Balochistan	KPK	GB	AJK	Islamabad	FATA	National
2012	36.0	13.5	16.4	31.5	37.4	38.1	52.0	20.3	26.6
2013	37.1	17.8	17.2	29.9	31.2	41.0	28.6	25.8	27.3
2014	35.6	22.3	12.3	29.7	35.0	39.4	42.3	28.1	26.5
2015	36.7	22.1	16.8	33.1	37.4	48.4	56.5	28.6	29.3
2016	34.0	13.4	13.9	27.7	32.0	61.8	34.7	20.7	26.0
2018	43.1	25.4	23.9	39.5	46.1	54.2	45.8	31.9	35.0
2019	44.9	24.1	15.8	26.2	35.9	49.3	44.0	20.2	29.7

5 Evidence on the Preparedness of Learners

5.1 Introduction and overview

This sub-section presents available data that allows us to focus more deeply on the component of the Conceptual Framework that looks at 'prepared learners'. The critical element underpinning the notion of a 'prepared learner' is that schools cannot effectively produce learning without children who are 'prepared, present, motivated learners.' (WDR 2018). Not only do children need to come to school and continue doing so on a regular basis, they need to be well nourished and motivated to learn. Improving nutrition, care, stimulation, nurturing and protection in early years could be achieved through broader access to pre-primary education, but it may also require interventions in the community or investments to improve the quality of pre-primary education.

This section begins with primary analysis of access indicators (school readiness, pre-primary enrolment) from ASER, MICS and administrative data over the 2011-2019 period. Pupil attendance rates from ASER can also be used as proxy for learner preparedness. For a more nuanced understanding we rely heavily on MICS reported data in 2014 and 2017/18 (some data from 2011) which provide insights into nutrition, health, early stimulation and responsive care for children under 5. The latest round of MICS (2017/18) also explores the learning environment at home and parental involvement for children 7-14 years, allowing us to look at preparedness as a continuous process of support.

The data reveal that pre-primary GER in the Punjab have increased from 79.4% in 2011 to 115.6% in 2017 (rural Punjab shows no improvement in ASER), according to MICS. Growth in NER has been slower, implying that an increase in children attending pre-primary classes has not necessarily been at the age-appropriate level. Richer pupils and those in urban areas are more likely to access pre-primary schooling, with gaps by location narrowed over time. The share of private schools in pre-primary enrolment has increased such that the more than half of pre-primary GER can be attributed to the private sector in 2016. More importantly, it seems that children entering Punjab's schools are not appropriately nourished and stimulated. While there has been improvement in early childhood nutrition, concerns remain. In terms of early childhood development, children 3-4 years lag significantly behind in basic literacy-numeracy tasks with only 27.2% having basic familiarity with the alphabet, simple words and numbers up to 10 in 2017. Limited evidence shows low learning support for children under 5 in terms of availability of materials (books) and early stimulation activities with adult household members. Similarly, children 7-14 years lack a conducive learning environment at home as well as parental support for learning at school. Wealth and regional disparity is evident with children from richer households and urban areas better prepared for schooling.

Preparedness indicators are difficult to measure. More nuanced data is needed on, for instance, whether children enter into suitable and good quality early years learning environments. Initiatives such as the Early Learning Partnership (ELP), a multi-donor trust fund managed by the Work Bank, promote increased investment in children's early years' opportunities and outcomes. In some countries this has involved using the MODEL and MELE tools within the Measuring Early Learning Quality and Outcomes (MELQO) initiative designed to generate data on children's learning and development at the start of school and within pre-primary learning environments. Using such tools,

adapted to the local context, provides one opportunity for assessing the preparedness of learners within an education system.[21]

5.2 Data sources and quality

There is limited data that can accurately measure the preparedness of learners, encompassing all aspects of the term, over the evaluation period. ASER and MICS data, along with EMIS and PSC provide crude measures in the form of enrolments at the pre-primary level. Household versus administrative estimates are not comparable due to the different age brackets used (3-4 years versus 0-4 years). While the administrative data sets provide information on participation in early childhood programmes regardless of age, the household survey data sets better allow us to understand preparedness for the under 5 year age group.

One concern that our focus on only the 3-4 year olds, when calculating enrolment from household data, to identify early learners may be a very inaccurate assessment of the true age of participants at the pre-primary level. It is worth noting that whilst Article 25-A protects the right of every child aged 5-16 years to free education, and serves the basis of official stipulation of entry age of 6 into primary with at least one year of pre-primary education, in practice there are vast differences in ages at which children actually enter school. According to Jamil and Saeed (2018), ECE provision is well articulated provincially in Pakistan:

Chapter 3 of the Punjab Free and Compulsory Education Act 2014 (makes) provision for providing free preschool education and early childhood care for the children above the age of 3 years until they join a school for education. In practice, deviations from the prescribed rules continue to occur, where children are seen to be enrolled into early childhood much earlier or later.[22]

These authors conducted a survey of ECE provision in select districts of the Punjab and found approximately 30-33% children enrolled in ECE to be aged between 2-4 years with 52-54% falling in the 4-7 age range and 15-16% attending ECE aged 7 or above.[23] The Punjab ECE Policy 2017 seems to sets out a policy strategy targeting children aged 3-5 years through the establishment of ECE classrooms to prepare their transition to primary school (intended to replace the *katchi* or equivalent class in given schools).

A focus on the early years when collecting data is required as the early childhood period (0-8 years) is known to be a period of intense child development requiring focused and sustained cross-sector interventions. The long-term consequences of missing this window are severe. There is consistent evidence which suggests that inequalities that start in the early years are likely to persist and widen in later schooling (Heckman, Lancet Series, Young Lives studies)[24]. This demands a renewed focus on addressing inequalities in both access to early grade education and ensuring a minimum quality threshold. It is clear from the discussion above that enrolments in early years in the Punjab (as in the rest of the country) remain low. There have been recent efforts by provincial governments in collaboration with multilateral and bilateral development partners to explore options and innovations for improving early years' provision (Jamil and Saeed 2018)[25]. The most crucial development for the

[21] http://www.worldbank.org/en/topic/education/brief/early-learning-partnership
[22] file:///C:/Users/aslam/Downloads/ECE%20policy%20brief%20final.pdf
[23] Ibid.
[24] Heckman, J. J. (2008); Woodhead, M., Dornan, P. and Murray, H. (2013).
[25] file:///C:/Users/aslam/Downloads/ECE%20policy%20brief%20final.pdf

Punjab has been the official articulation of an Early Childhood Education Policy for the Punjab (2017) which sets out the provincial government vision for preparing learners in the early years.

Measuring 'learner preparedness' requires a far richer set of indicators for which we rely on MICS reported data from 2011-2017. This data source has been analysed in the latest RESP revision, allowing for better indicators to understand this component. This exercise provides robust estimates that are representative for Punjab for children under 5 years, and in line with global definitions and measurements. While MICS does not provide a comprehensive review of changes over the evaluation period (i.e. early stimulation and responsive care indicators are recorded in 2014 onwards), such indicators simply do not exist in the data sets identified in our DQAs. This also means we are unable to triangulate these findings with other data sources. Disaggregations by wealth and location are particularly useful in identifying gaps in foundational literacy and numeracy skills, learning environment at home as well as the parental involvement in the learning process.

Measuring pupil motivation is also challenging and the ASER data provide a proxy measure in the form of pupil attendance. There are strengths and weaknesses that underlie this particular indicator within the ASER data set. The data reportedly measures student attendance using the enumerator's headcount of present students (along with a headcount of all enrolled students in the school, which allow pupil attendance rates to be calculated). This is a far superior way of estimating true pupil attendance rather than using head teacher or teacher reports of overall attendance rates. However, the quality of the measure heavily depends on the enumerator's report of the estimated head count as well as the accuracy of pupil enrolment records in the school. There is also the fundamental question of the extent to which student 'attendance' as measured at a cross-section in time can truly proxy for pupil motivation. As this can only be estimated at a point in time, it may not capture seasonal variations (e.g. pupils missing school more in crop-harvesting seasons) if data is not collected at that point in time.

Table 36 Data sources, indicators and definitions (prepared learners)

Indicator proxying 'prepared learners'	Data Set	How it is defined
Data directly analysed:		
Student attendance/ enrolment rate in 'pre-primary'	ASER (2012-2019) MICS (2011 - 2017/18) ACS/EMIS (2012-2020) PSC (2011; 2016)	Pre-primary GERs and NERs (enrolment in *katchi*/pre-primary/ECE/kindergarten etc.). For household survey data the 3-4 age bracket is used. For administrative data the corresponding population estimates are available for the 0-4 age bracket.
Pupil attendance rates	ASER (2012-2019)	Headcount report of children present in school (compared to enrolments) on day of visit, at any level of education. This can be used as a proxy for child motivation.
Data not directly analysed but sources from reports:		
School readiness	MICS (2011 - 2017/18)	Percentage of children in Grade 1 who have attended an early childhood programme (pre-school, *katchi*, nursery, etc.) in the previous school year.
Child health and nutrition	MICS (2011 - 2017/18)	Percentage of children under 5 who are two standard deviations away from the median of the reference weight-for-age, height-for-age and weight-for-height (moderate to severe underweight, stunting and wasting, respectively). Percentage of children 6-23 months who received the minimum acceptable diet (minimum meal frequency and diet diversity) in the previous day. Percentage of children 12-23 months with full basic immunization, according to vaccination cards and mothers' reports.
Early childhood development index	MICS (2014 - 2017/18) SABER SD (2018)	This index tracks the development status of children (3-4 years) as a foundation to future learning and well-being. Children are assessed on literacy-numeracy, physical, socio-emotional and learning domains. The ECDI is the percentage of children who are on track within at least three of the mentioned domains.
Support for learning at home	MICS (2014 - 2017/18)	Percentage of learning materials at home – books and types of play things for children under 5. Child involvement in early stimulation and response activities (reading or looking at picture books, telling stories, singing songs, took child outside home, played with children or named, counted or drew things for child) with household adult member in the last three days, for children 2-4 years. Percentage of books, reading, language comprehension and help with homework at home for children 7-14 years.
Support for learning in school	MICS (2017/18)	Percentage of parents that received school report card, and are involved in school management and school activities for children 7-14 years.

5.2.1 Annual Status of Education Report

Data on key educational outcomes are collected from across all districts in Pakistan in the ASER data set. Since education information is collected for children aged 3-16 years, this allows to calculate access among the 3-4 year age group. In the ASER data set, this class level encompasses everything before Grade 1 and is referred to using multiple names – ECE, *katchi*, kindergarten, nursery, *paki*, playgroup and prep. The advantage of the ASER data are that they are very large scale, timely, and publicly available and attempt to capture enrolments at the pre-primary level. The main disadvantage is that these data are mainly focused on rural areas and appear to subsume a wide variety of pre-primary enrolment without distinguishing between types of programmes that may be on offer, duration of the programme, the time actually spent by a child, facilities available etc. The data on educational outcomes can be disaggregated by location, by province, district, by gender and age, and also by a proxy of SES (and disability from 2015-2018).

5.2.2 Multiple Indicator Cluster Survey

The MICS survey is a global exercise to measure the well-being of women and children by UNICEF and provides data against key indicators of the Millennium Development Goals and Sustainable Development Goals. The education module records data for household members aged 3-24 years and respondents are asked if they have attended school or pre-school/*katchi*/ECE programme. Although no further information, such as school type or tuition, is recorded for children at this level, access indicators can be disaggregated by age, gender, school type and location. Detailed information is collected on household assets which serve as a proxy for SES.

The MICS has a dedicated questionnaire for children under 5 years, administered to mothers or caretakers of all children under 5 living in the household. Extensive pre/postnatal care, health and nutrition information, along with anthropometric measurements, are collected in this module. Selected indicators on child nutrition and immunisation are presented below for 2011-2017. This module also provides information on early childhood development such are learning materials at home, learning activities with household members along with child's physical growth, socio-emotional skills and aptitude to learn. This information is available in 2014 and 2017, allowing for limited comparability over time. The latest round of MICS, 2017, also collected data on support for learning at home and in the school (through parent involvement) for children 7-14 years, as part of the questionnaire for children 5-17 years (this questionnaire is only administered to one child in this age group, at random, from the household). Data from both our analysis, in line with ASER access indicators, and reported figures is discussed in this section.

The latest round of the MICS also gathers data on disability. Within the questionnaire for children under 5, the disability module is administered to ages 2 and above using the child functioning set of questions by the Washington Group on Disability Statistics. For this age group, child functioning is gauged on the following domains seeing, hearing, walking, fine motor, communication, learning, playing, and controlling behaviour. Since these estimates are only available for one point in time (see Annex F), we are unable to comment on how this has changed over the PESP2 period.

5.2.3 Education Management Information System and Private School Census

The EMIS and PSC are administrative data sets that aim to collect data on all public and private schools in Punjab. In the EMIS, enrolment numbers are available by gender for the *katchi* class.

Enrolment information by child's age, which is necessary to calculate participation rate and NER, is though only available in the raw data from 2012 to 2015. Similarly, the PSC collects enrolment data, by gender, for pre-nursery, nursery and prep classes. Since student enrolment is only recorded by grade, and not age, participation and NER cannot be calculated from this data set. The main limitation with relying on GER is that it only conveys information about the number of children in pre-primary grades, without providing insight into age-appropriate enrolments.

In order to calculate access indicators, the information on enrolment from these data sets is supplemented with population estimates from the United Nations, Department of Economic and Social Affairs, Population Division. Hence, the age bracket available to us is 0-4 years of age. Since, children are unlikely to participate in formal learning within the first two years of their birth, using these statistics will provide an underestimation of access. Still, these population estimates allow for a comparison between public and private sector participation.

While provisional data from 2020 has been made available to analyse, there are issues of comparability over time with this round. The data shared only includes schools under the School Education Department (SED), excluding public private partnership schools that are represented in previous EMIS rounds. Hence, the 2020 data cannot be compared to previous rounds.

5.3 Commentary on trends

The WDR (2018) has identified the following three aspects as underpinning learner preparedness: provision of early childhood nutrition, care, stimulation and learning opportunities; lowering school costs, boosting effort and motivation and remediation for further education and training. There is now an increasing evidence base for policy and programming across the world that shows the value of Early Childhood Development and particularly of early stimulation and learner preparedness. It is also recognised that investing in early learning benefits primary education and the whole education system. This is based on the recognition that the 'learning crisis' starts in the early years and investing in the pre-primary years can help address this crisis earlier[26]. This section of the report focuses on limited data on elements of 'prepared learners' and the provision of learning opportunities to children in the early years, relying heavily on the MICS data set.

[26] Crouch (2017) identifies a close statistical link between low levels of pre-primary participation and resultant inefficiencies in the early primary grades and subsequent low cognitive outcomes. In making a case for the scale-up of pre-primary schooling, he notes that admitting underage children into over-crowded and poorly resourced classrooms results in grade repetition during the early years and results in 'churning'. In the absence of pre-primary schooling, large numbers of children enter grade 1 where they 'churn' for a few years without learning much before progressing to further grades.

Table 37 Models of human behaviour that can guide learner preparation

Synthesis principle	Where this fails	Models that identify a mechanism behind this failure	Approaches that address the modeled mechanism
Provide early child nutrition, care, stimulation, and learning opportunities.	Just one in five children in low-income countries attend preschool. One in four children worldwide are stunted.	*Information failure:* Stakeholders may not be aware of relative returns to early investments or how to support early development. *Simple optimization with liquidity and credit constraints:* Parents are aware but lack the resources to invest. *Behavioral (mental bandwidth):* Stress of poverty undermines parenting capacity.	In Jamaica, a program taught caregivers to provide psychosocial stimulation that improved stunted children's developmental scores and later life outcomes. In Mexico, a conditional cash transfer program improved cognitive and motor development. In Argentina, Bangladesh, China, and Uganda, center-based programs improved children's outcomes.
Lower school costs; boost motivation and effort.	263 million children remain out of school. Many countries still charge fees for lower secondary school, and primary school, while usually tuition-free, still entails cash outlays in many settings.	*Simple optimization with liquidity and credit constraints:* Parents are aware but lack the resources to invest in any or all children. *Information failure:* Youth and parents may underestimate the returns to education. *Behavioral (hyperbolic discounting):* Youth may recognize the value of education but plan to invest later (yet "later" never comes).	In Cambodia, providing scholarships to girls dramatically increased enrollment. In the Dominican Republic and Madagascar, providing information on the returns to education improved enrollment and learning. In Pakistan, reporting child test scores to parents increased enrollment and learning outcomes.
Ensure that, where needed, remediation is the first step in further education and training.	Many skills training programs assume prerequisite skills that youth do not have.	*Information failure:* Training programs receive imperfect signals about the quality of incoming learners. *Simple optimization (on the part of training centers):* Remedial students are highly likely to drop out.	In U.S. community colleges, improving course placement accuracy and support services helped increase students' long-term performance. In the United States, bridge programs help learners move past remediation quickly.

Source: WDR 2018 team.

There is limited data that can help address the issues we are interested in, in this particular sub-section over the evaluation period. Our primary data analysis (data sets identified in DQA I and DQA II) are largely restricted to enrolment in pre-primary which is a crude measure of learner preparedness (see below) but is the only measure on early years available to us from 2012-2019. The information is available in the ASER, MICS and administrative data sets, and is reported below.

5.3.1 Trends in attending pre-school

More and more children in Punjab are attending pre-school before starting primary school

Various forms of early childhood education (ECE) ease the transition into primary education, familiarising children with concepts they will later learn in school. Data from the MICS survey points towards increasing school readiness of children starting primary school between 2011 and 2017 (Table 38). According to the latest round, 90.6% of children in Grade 1 have attended pre-school in the previous school year, an increase from 79% of children in 2011. Another positive finding is that gaps by wealth and location have decreased over time.

Table 38 School readiness (%), by gender, wealth and location

	2011	2014	2017/18
Overall	79.0	92.5	90.6
Gender			
Male	78.3	92.5	90.6
Female	79.8	92.6	90.7
Wealth Index Quintile			
1	70.1	90.0	89.9
2	73.8	92.3	91.0
3	81.2	90.9	91.1
4	85.1	94.9	90.7
5	86.7	94.8	90.5
Rural/Urban			
Rural	76.9	91.9	91.3
Urban	84.8	93.9	89.3

Source: MICS 2011 Survey Findings Report; MICS 2014 Survey Findings Report; MICS 2017-2018 Survey Findings Report

Pre-primary enrolment in the Punjab has shown a marginal increase during the past few years, but majority of children 3-4 years are not participating in formal learning

GER and NER in the early years are estimated (measured at the pre-primary level, before the beginning of Grade 1). For estimation purposes in this report, we restrict enrolment to ages 3-4 years, but we recognise that there are likely to be over-age and under-age children at this level of education. GER/NER are calculated using the following formulas for household data:

GER = all children that are reported as being enrolled at the pre-primary level / all the children that are reported as being aged 3-4 years

NER = all children 3-4 years that are reported as being enrolled at the pre-primary level / all the children that are reported as being 3-4 years

According to ASER, GERs have largely remained the same increased over the 2012-2019 period (Table 39) for rural Punjab. While there is a higher proportion of boys being enrolled than girls (80.8% for boys compared with 65.6% for girls) in 2012, this gap has reduced over time till 2019. The net enrolment at this level of education has also been static (Table 40). The figures only show small gender differences.

On the other hand, MICS estimates show a gradual increase in both pre-primary GER and NER overall, and by gender and location in both urban and rural Punjab (Table 39 and Table 40). More specifically, there has been a 36.2 percentage point increase in pre-primary GER between 2011 and 2017 but only an 11.8 percentage point increase in pre-primary NER over the same period. As discussed earlier, while this implies an increase in children attending pre-primary classes, this is has not necessarily resulted in an increased in age-appropriate enrolment.

Table 39 Pre-primary GER (%) by gender and location

Data set	ASER							MICS		
	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
Overall	73.4	75.0	76.7	68.5	76.6	67.4	72.0	79.4	96.0	115.6
By Gender										
Male	80.8	79.7	79.7	74.7	81.1	70.6	73.8	84.6	101.2	120.0
Female	65.5	70.0	73.3	62.0	72.0	64.8	70.0	74.0	90.8	111.0
By Location										
Rural	73.1	72.3	76.3	67.4			66.4	74.9	91.6	114.5
Urban	80.9	126.1	79.3	78.6			97.5	91.7	106.1	117.7

Table 40 Pre-primary NER (%) by gender and location

Data set	ASER							MICS		
	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
Overall	30.1	22.0	26.0	23.2	31.9	24.1	30.2	21.1	28.9	32.9
By Gender										
Male	31.8	22.4	27.6	24.4	33.0	24.6	30.9	21.9	28.7	32.8
Female	28.4	21.6	24.3	22.0	30.8	23.8	29.5	20.4	29.2	32.9
By Location										
Rural	30.0	21.4	25.6	23.1			24.5	17.2	24.7	31.4
Urban	34.2	35.0	29.4	24.5			56.1	31.6	38.4	35.8

5.3.2 Pre-primary access and socio-economic factors

There are pre-primary access gaps by wealth status and by location

There are clear differences in access to ECE by the richest versus the poorest, with the richest more likely to be enrolled in pre-primary education. While the gap seems to have narrowed in both data sets over time (Table 41 and Table 42), this has not been consistent.

Table 41 Pre-primary GER (%) by wealth quintiles

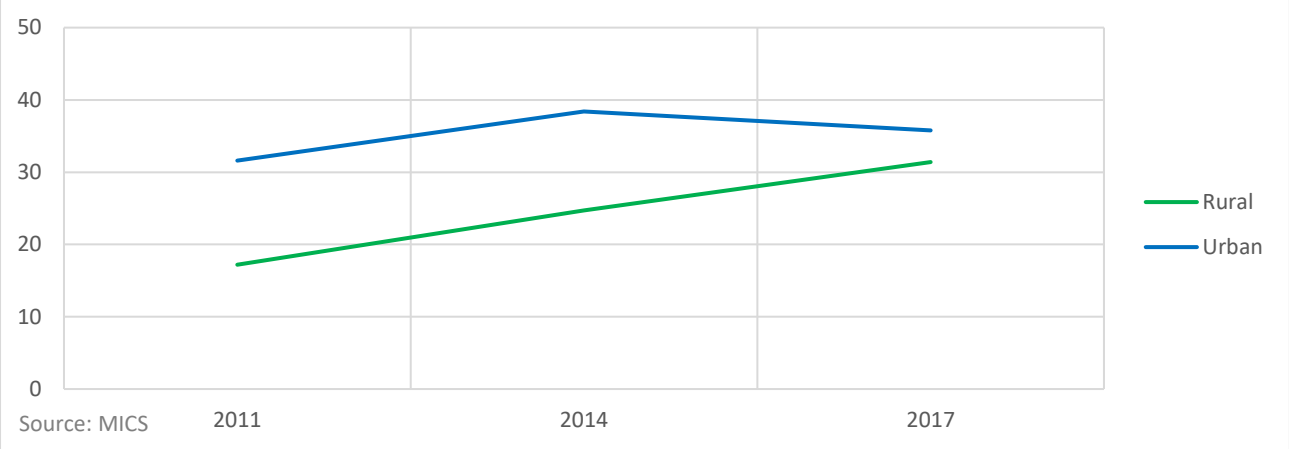
Data set	ASER							MICS		
	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	58.7	58.5	60.2	61.4	69.3	74.9	61.5	56.0	72.3	116.0
2	67.3	68.1	75.5	70.8	76.5	62.8	64.6	80.1	101.1	120.1
3	69.5	72.2	75.4	72.8	79.5	67.7	69.0	87.7	102.1	115.6
4	77.2	76.4	74.7	72.3	77.6	66.7	69.5	89.5	105.7	111.6
5 (rich)	76.0	80.8	81.7	66.9	77.5	67.1	72.9	91.7	106.6	114.3

Table 42 Pre-primary NER (%) by wealth quintiles

Data set	ASER							MICS		
	2012	2013	2014	2015	2016	2018	2019	2011	2014	2017/18
1 (poor)	23.5	11.1	16.0	19.1	26.8	22.4	24.9	6.8	11.1	21.1
2	26.3	18.7	23.9	19.8	29.7	22.1	20.5	14.9	22.1	30.5
3	30.8	19.3	22.9	22.3	33.9	22.4	26.3	22.7	30.6	35.7
4	31.3	22.1	25.6	24.9	31.7	22.8	28.2	29.5	39.1	37.9
5 (rich)	32.9	26.1	29.8	24.8	34.2	24.8	32.6	37.9	48.5	42.8

Enrolment in urban areas is slightly higher than in rural areas in both of the data sets. Figure 28 shows that this gap has narrowed over the years, according to MICS data. ASER also shows a large disparity by location, particularly in the latest round (Table 39 and Table 40). Part of the reason behind such a large is gap is that ASER is primarily a rural exercise with data from selected larger urban centres (i.e. Lahore, Multan, Faisalabad, etc.) which might skew the urban average. These findings are in line with our previous analysis on participation (Section 3), children from poorer households and in rural areas are less likely to enrol in school or ECE programmes.

Figure 28 Pre-primary NER (%), by location (MICS)

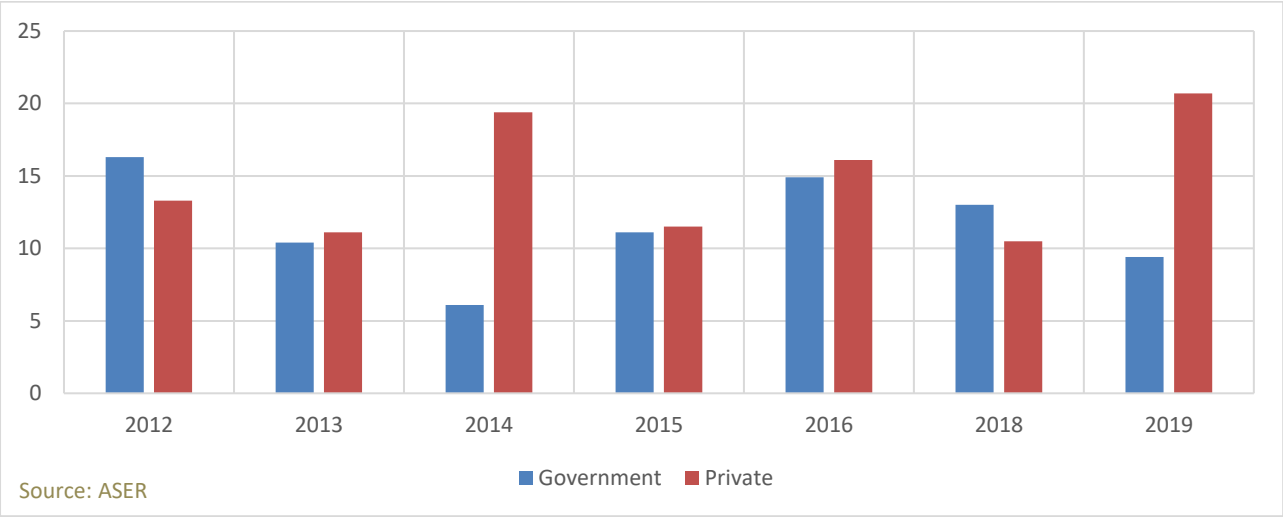


5.3.3 Role of the state and non-state sectors

The non-state sector provides access to pre-primary education for a large share of children in Punjab

Data from ASER shows that there is a fairly equal provision by type of provider in terms of pre-primary programmes, with the exception of 2014 and 2019 when the private share of enrolment exceeds that of public schools. In the latest round, more than twice the number of children ages 3-4 years report attending private pre-primary classes than their equivalent in public schools.

Figure 29 NER pre-primary (%), share of government and private sector



Combining this information with census data on public and private schools allows us to further explore education service delivery. GER/NER calculated using administrative data uses a slightly different formula than the one mentioned above for household data, as shown below:

GER = all children that are reported as being enrolled at the pre-primary level / all the children in Punjab aged 0-4 years

NER = all children 3-4 years that are reported as being enrolled at the pre-primary level / all the children in Punjab aged 0-4 years

As the denominator from administrative enrolment ratio is wider than that of household enrolment ratio (all children 0-4 years versus all children 3-4 years), these statistics are much lower than household estimates. NERs from administrative data (Table 43) estimate the government share of under 5 year net enrolment to be around 5%.

Table 43 Pre-primary NER (%) share of government schools

	2012	2013	2014	2015
Pre-primary level (Katchi & 0-4 years)	4.4	5.3	5.2	5.1

In addition to the primary data reported above, the ECE Policy for Punjab (2017) reports data that adds interesting insights. The report notes that currently ECE is being offered by both government and private providers and is mainly centre-based and formal. According to Private School Census Data (2016-2017) reported in the Policy Document, 54,000 private providers in the Punjab offer early education through Pre-nursery, Nursery and Prep. The public sector offers two main services: 1) traditional pre-primary classes/*Katchi* and 2) An ECE classroom or converted *Katchi* class which is similar to formal centre-based ECE provision that encourages play based learning through trained ECE teachers/caregivers. Tradition pre-primary classes or *Katchi* are being offered in 51,155 out of the total 52,819 schools in the province. The Policy Document reports that according to Annual School Census Data (2016-17), *Katchi* enrolment in public schools is 2,246,358, compared to 684,564 in Pre-Nursery, 1,364,791 in Nursery, and 1,122,680 in Prep classes in private schools.[27] The second type of structure is offered in more than 3,000 primary schools across 36 districts in the province (with 900 or so classrooms having been established with UNICEF support and 343 with support from Plan International). It notes that the shift from play-based learning in ECE to book-based learning in Grades 1-3 continues to be a challenging transition for children. Currently, more than 11,000 ECE classrooms have been established across Punjab.[28]

[27] According to the raw data available to us (ASC/EMIS and PSC in 2016), *Katchi* enrolment in public schools is 2,236,570, compared to 732,170 in Pre-Nursery, 1,449,498 in Nursery, and 1,200,096 in Prep classes in private schools. Overall the trend is the same, more children at the pre-primary level in private schools in 2016.
[28] https://pesrp.edu.pk/punjab-ece-policy/

Table 44 shows the pre-primary GER from census data. The share of government schools in terms of early childhood enrolment has remained largely static (14.7-17.1%) between 2012 to 2018, and declined in 2019. The share of the private sector does show a 7 percentage point improvement between 2011 and 2016. Moreover, in 2016 the private share of pre-primary enrolment exceeds the public share, providing support for the ‘mushrooming’ of non-state education delivery.

Table 44 Pre-primary GER (%) by school type

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Share of government schools (EMIS)										
Overall		14.9	16.5	15.3	14.7	15.4	17.1	15.7	11.6	7.0
Female		14.8	16.5	15.5	14.9	15.4	17.0	15.6		
Male		15.0	16.5	15.2	14.5	15.4	17.2	15.9		
Share of private schools (PSC)										
Overall	16.2					23.2				
Female	15.3					22.6				
Male	17.1					23.8				

5.3.4 Child nutrition and health

Child nutrition and health shows improvement in Punjab, but concerns remain

Early child nutrition, health and the physical environment mainly determine a child's biological development (WDR 2018). Selected published indicators from MICS on nutrition and health status of children under 5 show improvement from 2011-2017. Anthropometric data collected in this data source allows for the calculation of the nutritional status of children. Using WHO growth standards, a child is categorized as being moderately or severely underweight, stunted or wasted if the child's weight-for-age, height-for-age, and weight-for-height is two standard deviations below the median of the reference well-nourished population, respectively (MICS, 2017-18). This is the result of either poor nutrition or disease. Despite an improvement in indicators (Figure 30), 31.5% of children are moderately or severely stunted (short for their age) and 21.2% are moderately or severely underweight in 2017. Nutrition status varies by SES (Figure 31 Nutrition status of children under 5 (%), by SES), especially height-for-age, such that poorer children might be unable to reach their growth potential.

Figure 30 Nutritional status of children under 5 year (%)

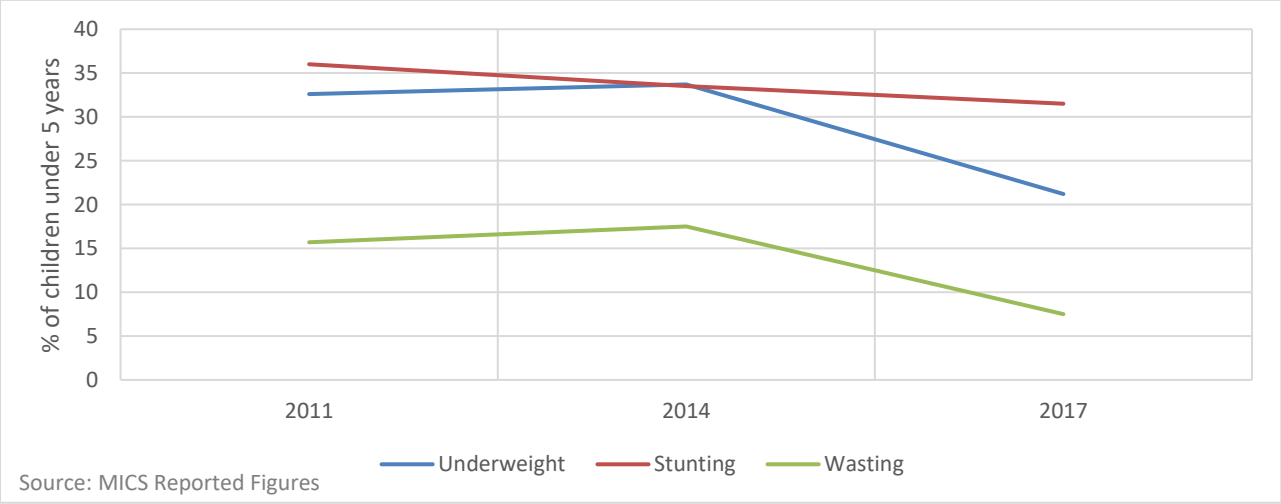
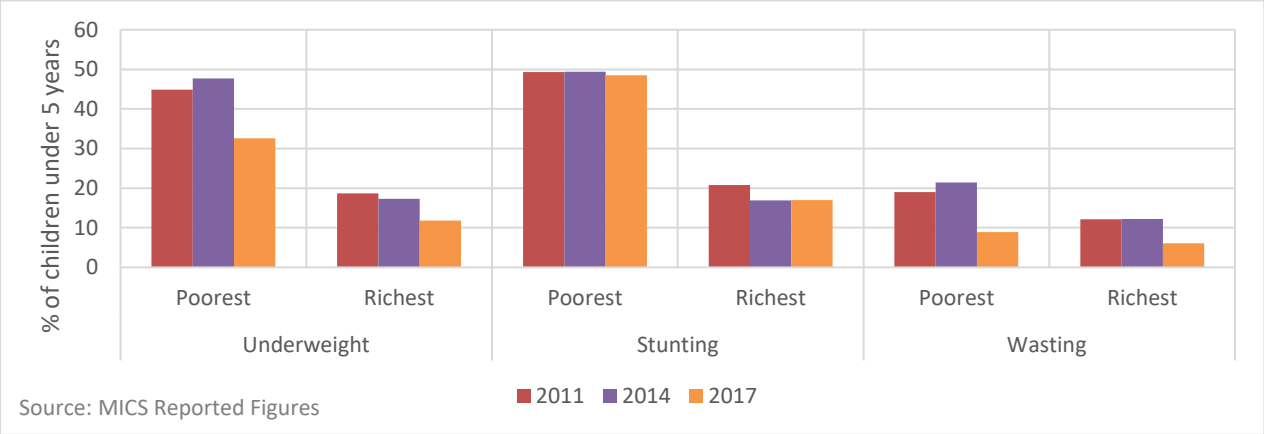


Figure 31 Nutrition status of children under 5 (%), by SES



Another way to measure nutrition is through infant and young child feeding practices. Along with breastfeeding, children must receive liquid and solid foods at the appropriate age. The MICS calculates the minimum acceptable diet for children 6-23 months included the minimum meal frequency and diet diversity (number of food groups), with slight differences by breastfeeding status. While this indicator has shown progress between 2014 and 2017, the majority of the children are reported as not receiving the necessary nutrition.

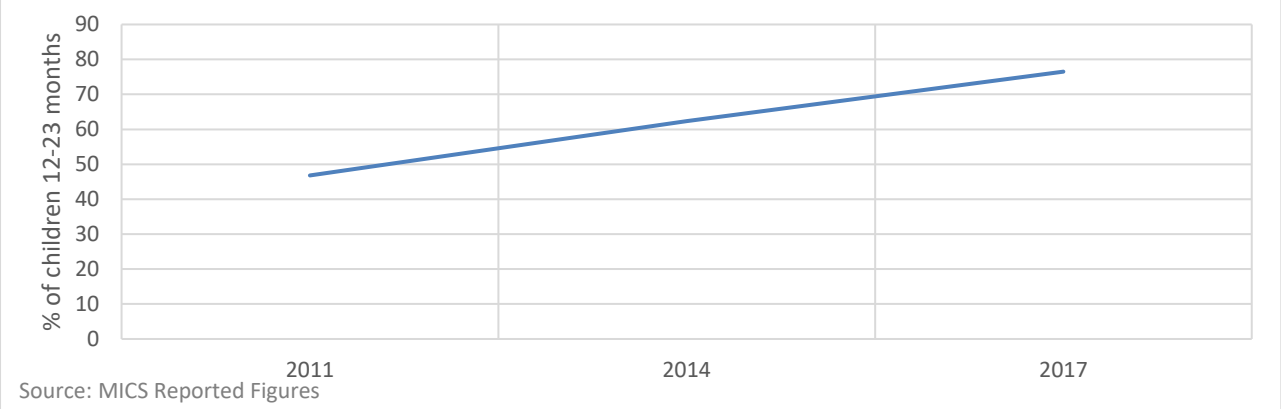
Table 45 Children (6-23 months) who receive minimum acceptable diet (%)

	Breastfed children	Non-breastfed children
2014	11.2	7.3
2017	14.0	9.3

Source: MICS 2014 Survey Findings Report; MICS 2017-2018 Survey Findings Report

Routine immunization in the first few years of life protects children against preventable disease. The number of children 12-23 months with full immunization, according to vaccination cards and mothers' reports, increased from 46.8% in 2011 to 76.5% in 2017 (Figure 32 Immunization coverage (%) of children (basic antigens)). Children in urban areas and in richer households are more likely to be immunized (Annex F).

Figure 32 Immunization coverage (%) of children (basic antigens)[29]



5.3.5 Performance against child development milestones

Early childhood development lags in literacy and numeracy in Punjab

Children begin the learning process at home through interactions with other household members. The MICS exercise creates an early child development index (ECDI) to track the development status of children on the domains on literacy-numeracy, physical, social-emotional and learning. Children at the ages of 3-4 are expected to reach the milestones mentioned below as a foundation of future learning and well-being. "The 10 items are used to determine if children are developmentally on track in four domains:

1. Literacy-numeracy: Children are identified as being developmentally on track based on whether they can identify/name at least ten letters of the alphabet, whether they can read at least four simple, popular words, and whether they know the name and recognize the symbols of all numbers from 1 to 10. If at least two of these are true, then the child is considered developmentally on track.

2. Physical: If the child can pick up a small object with two fingers, like a stick or a rock from the ground and/or the mother/caretaker does not indicate that the child is sometimes too sick to play, then the child is regarded as being developmentally on track in the physical domain.

3. Social-emotional: Children are considered to be developmentally on track if two of the following are true: If the child gets along well with other children, if the child does not kick, bite, or hit other children and if the child does not get distracted easily.

4. Learning: If the child follows simple directions on how to do something correctly and/or when given something to do, is able to do it independently, then the child is considered to be developmentally on track in this domain.

ECDI is then calculated as the percentage of children who are developmentally on track in at least three of these four domains" (MICS, 2017-18).

[29] Basic antigens include BCG, Polio3, PENTA (DTP3, HepB3, Hib3) and Measles, according to MICS 2017/18 Report.

Overall, 59.4% of children 3-4 years are developmentally on track in at least three of the four domains in 2017, a decrease from 67.2% of children in 2014. Girls, along with children in urban areas and wealthy households report a higher ECDI score. Gaps by gender, location and wealth have persisted over these data points (Table 46).

A breakdown of the performance on each of the domains highlights that children ages 3-4 lag significantly behind in basic literacy-numeracy tasks. While 97.2% of children are on track physically, only 27.2% have basic familiarity with the alphabet and numbers up to 10 in 2017. Large gaps in literacy-numeracy scores by wealth and location have remained over time (and persist at the primary schooling level as discussed in Section 4). Similarly, SABER SD gathers information on child mastery of basic concepts when entering school through a retrospective parent survey (i.e. back when your child was entering school) for a sample of 3,727 children. Around 70-80% of children were unable to write Urdu and English letters and words, while a third of children cannot count to 10, with children in high SES households performing better.

Table 46 ECDI score (%) by domain

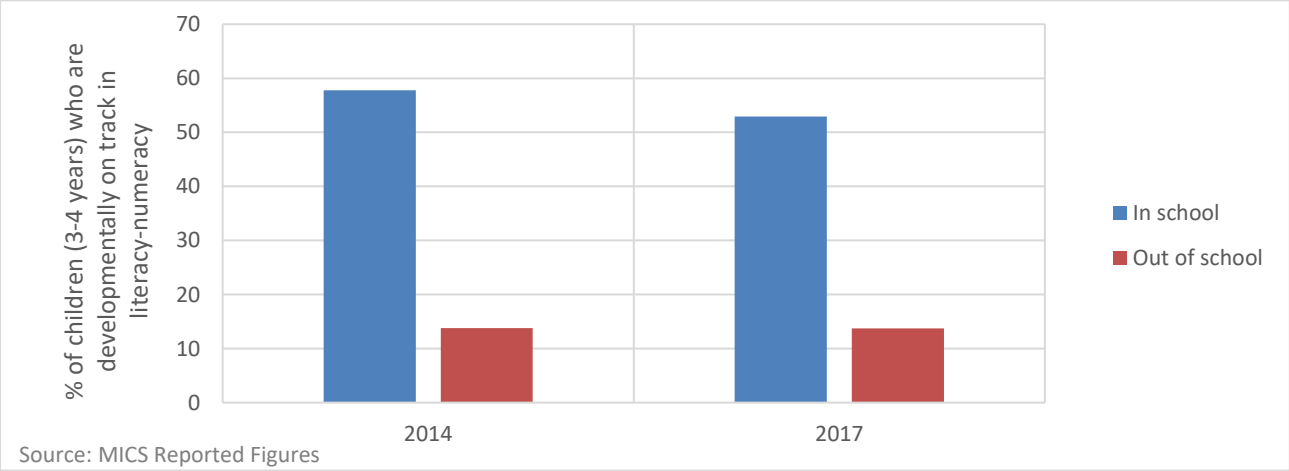
	2014					2017/18				
	ECDI score	Literacy-numeracy	Physical	Social-Emotional	Learning	ECDI score	Literacy-numeracy	Physical	Social-Emotional	Learning
Overall	67.2	25.1	97.7	62.2	93.6	59.4	27.2	97.2	51.7	93.4
Gender										
Male	65.2	23.8	97.4	60.3	93.3	57.5	26.5	97.2	49.3	93.2
Female	69.3	26.4	98.0	64.1	94.0	61.4	28.0	97.2	54.3	93.6
Wealth Index Quintile										
1	56.7	7.8	97.8	58.9	90.9	46.6	11.1	96.1	45.8	92.9
2	63.3	16.8	97.7	62.3	92.8	56.0	20.9	97.1	50.3	93.6
3	66.6	25.9	97.6	60.2	94.3	60.7	27.3	97.9	53.3	92.4
4	73.4	34.9	97.8	64.5	95.1	65.1	35.0	97.5	54.3	92.9
5	80.4	47.3	97.3	66.1	96.1	73.2	47.9	97.9	56.8	95.2
Rural/Urban										
Rural	63.5	20.0	97.6	60.3	92.8	55.9	22.2	97.0	50.8	92.8
Urban	75.6	36.5	97.8	66.2	95.5	66.1	36.9	97.7	53.4	94.6

Source: MICS 2014 Survey Findings Report; MICS 2017-2018 Survey Findings Report

Low performance in literacy-numeracy is present despite attendance to early childhood programmes. Figure 33 shows that only a little more than half (53-58%) of children 3-4 years who attend some form of pre-school are developmentally on track in literacy-numeracy while only 14% of children out of schools have basic familiarity. While schooling does improve the preparedness of children, it is not enough. This might also be due to the heterogeneity in ECE programme provision, which is not captured in the MICS survey. More data is needed on the quality of early learning environments.

With regards to the other domains, a little more than half of the sampled children showed social-emotional development. Children are largely on track in physical growth and readiness to learn (above 90%), with some differences by wealth.

Figure 33 Literacy-numeracy domain (%), by school participation



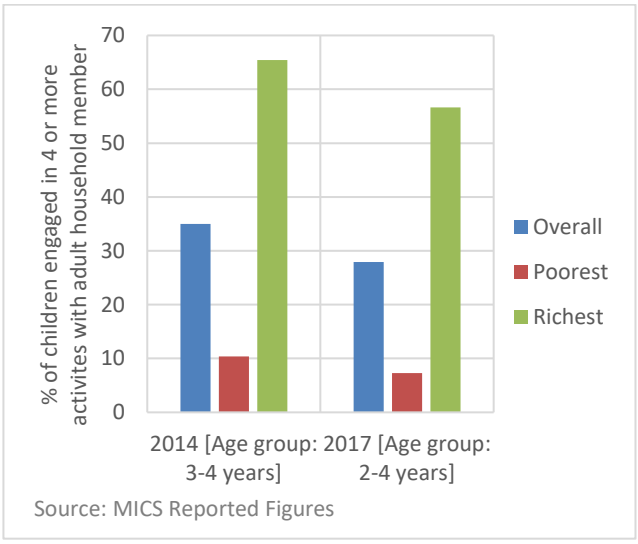
5.3.6 Support for learning in the home

There is limited support for learning in the household for children under 5, with gaps by wealth and location

The environment at home is an important determinant of future cognitive, physical, social and emotional development of children (MICS, 2017-18). Engagement of adults with children and presence of materials that stimulate learning, are indicators that the MICS under 5 questionnaire gathers data on to understand the home environment. More specifically, the MICS asks about involvement of adults with children in the following activities – reading or looking at picture books, telling stories, singing songs, took child outside home, played with children or named, counted or drew things for child – as a way to measure early stimulation and responsive care. This indicator was recorded for the 3-4 year age group in 2014 and the 2-4 year age group in 2017, limiting the comparability across rounds. Figure 34 shows that around 28% of children 2-4 years engaged in four or more activities with an adult household member in the past three days in 2017. Children in urban areas and richer households are more likely to have engaged in activities that promote learning and school readiness.

Caretakers are also asked about the number of children's books or picture books, and the types of playthings in the household for the under 5 age group. Overall, only 2.5% of children have three or more children's books in the home in 2017, down from 7.6% in 2014. Again, large differences are evident by wealth and location, with children in the lowest quintile households and in rural areas have limited (if any) access to children's books (Figure 35 and Figure 36).

Figure 34 Support for learning at home (%), by wealth and location



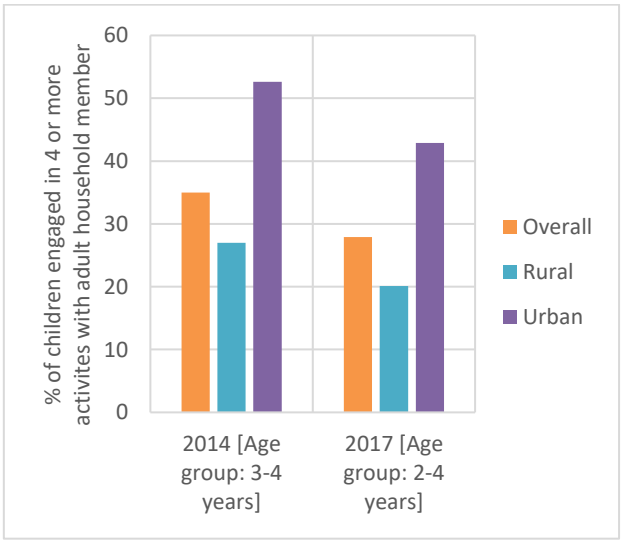
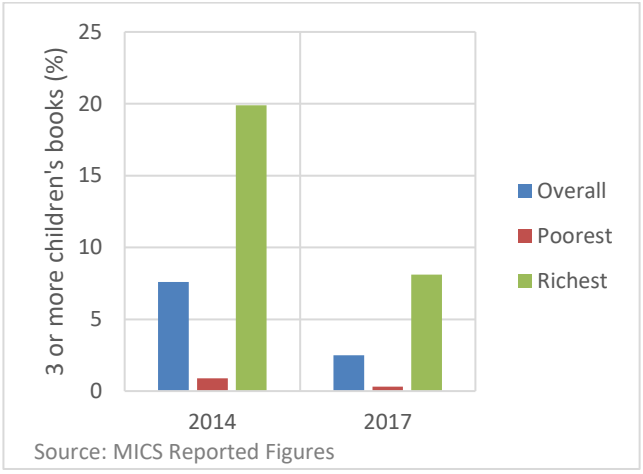


Figure 35 Learning materials at home (%), by wealth



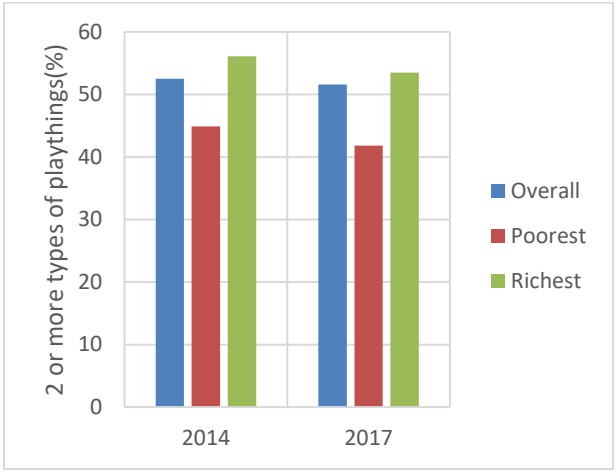
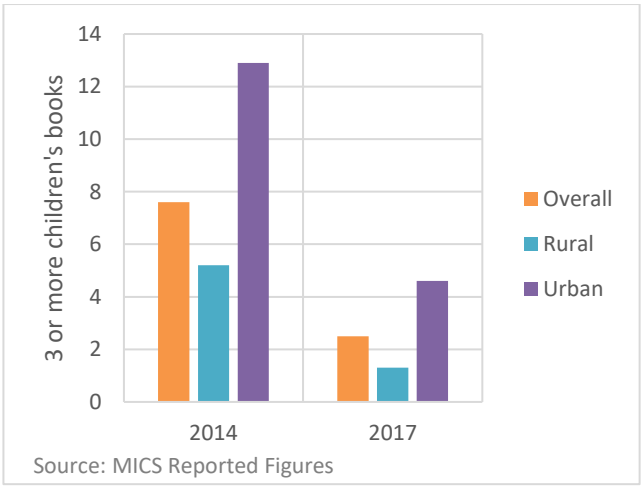
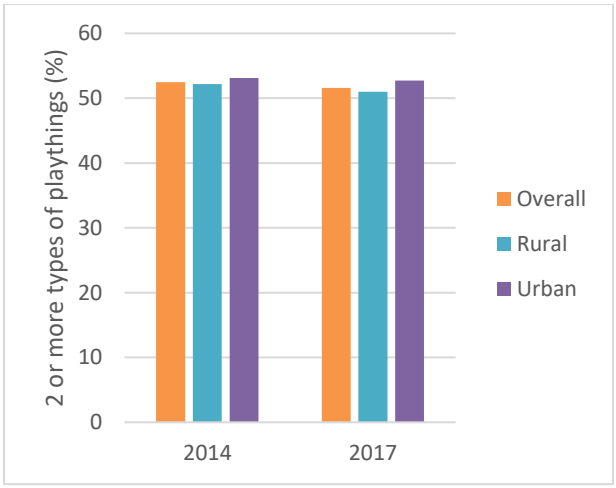


Figure 36 Learning materials at home (%), by location





Limited evidence suggests low support for learning in the household and parental involvement at school for children 7-14 years, with gaps by wealth and location

The home environment continues to play an important role in child learning. According to the PEC's PASL 2018-2019 Report, Grade 4 children that devoted more time to studying at home performed better than children that had a shorter study time. In the latest round of the MICS, the learning environment at home is explored for the 7-14 year age group. As presented in Table 47, these indicators include reading at home, language comprehension and assistance with homework. Although children in this age group have limited access to books (3.5%), more than half (59.6%) either read themselves or are read to at home. Again, there are stark differences by wealth and location with children from the richest households and in urban areas having more support. There is a higher incidence of language overlap in the home and at school among poorer households and rural areas, which is a positive finding. Still, gaps in language comprehension exist and might hinder the learning process. In terms of homework, less than half of children (47.7%) receive help at home.

Table 47 Learning environment at home (%), MICS 2017/18

Children (7-14 years) who…	Overall	Wealth		Location	
		Poorest	Richest	Rural	Urban
Have 3 or more books to read at home	3.5	0.5	10.4	2.2	5.9
Read books or are read to at home	59.6	39.1	75.7	55.4	67.4
At home use the language used by teachers at school, among children who attend school	7.7	13.2	9.6	8.2	6.9
Receive help with homework, among children who receive homework	47.7	21	68.4	41.3	57.9

Source: MICS 2017-2018 Survey Findings Report

Recent evidence from Pakistan finds that reporting child test scores to parents increased learning outcomes and enrolment as parent perception of school quality became linked to performance (Andrabi et al., 2017). MICS data is also gathered on parental support that occurs in school for school going children in the 7-14 year age group. This includes receiving a report card along with involvement in the school management and school activities in the last year. Overall, less than two-thirds of parents receive a report card (59.3%) or met with teachers to discuss child progress (57.9%). SABER SD also finds that parents are not particularly engaged in children's education (the exception being the willingness to spend on a private tutor), particularly with regard to learning performance. The data shows that parental support for child learning at school is higher in private schools, in richer households and urban areas in 2017 (Table 48).

Table 48 Parental support for children (7-14) learning at school (%)

	Children for whom household member received a report card for the child last year	Involvement by adult in school management in last year			Involvement by adult in school activities in last year	
		School has a governing body open to parents	Attended meeting called by governing body	A meeting discussed key education/ financial issues	Attended school celebration or a sport event	Met with teachers to discuss child's progress
Overall	59.3	18.8	14.2	9.4	27.8	57.9
School Type						
Public	48.8	12.8	8.3	5.2	17.7	49.9
Non-public	78.7	28.1	23.3	15.6	44.4	72.6
Wealth Index Quintile						
Poorest	25.9	5.0	2.5	1.4	7.1	34.1
Richest	86.8	37.9	32.5	22.7	52.7	78.6
Rural/Urban						
Rural	50.2	13.7	9.4	5.7	21.4	51.7
Urban	73.9	26.9	22.0	15.2	38.0	67.7

Source: MICS 2017-2018 Survey Findings Report

Limited support for learning among school going children hinders education participation. SABER SD directly asks about student school experience and their plans to leave school, finding that an overall 25% of children expect to leave school after the primary level (Grade 5). Children belonging to high socio-economic households are more likely to aim to finish school by Grade 12 while those in low socio-economic households are more likely to do so by Grade 10.

5.3.7 Pupil attendance

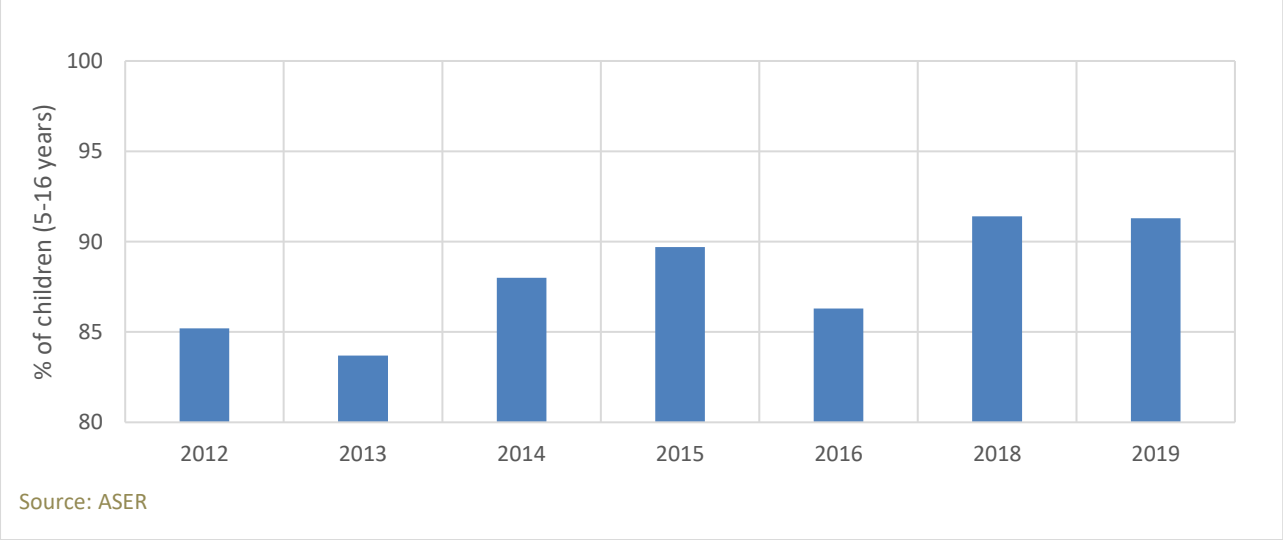
Punjab's pupils attend school on a fairly regular basis

Ensuring learners are well-prepared not only requires getting them into schools, but also ensuring that they remain motivated to attend. Pupil attendance, therefore, provides some indication of pupil motivation (although it is also dependent on other factors such as health and economic circumstances). ASER data report fairly high pupil attendance in the Punjab during 2012-2019 (Figure 37). This measure has been calculated as below:

Student attendance = (headcount of present students / headcount of enrolled students)*100

The reported numbers suggest an average attendance rate of 88% for all children aged 5-16 years.

Figure 37 Pupil (5-16 years) attendance (%)



Source: ASER

5.3.8 Comparisons between provinces

Despite low age-appropriate pre-primary enrolment in Punjab, the province is faring better than other areas of Pakistan

Punjab's performance in terms of enrolment is consistently higher in most regions, with the exception of Islamabad and AJK (Table 49).

Table 49 Pre-primary NER (%), Punjab versus other provinces/regions

	ASER						
	2012	2013	2014	2015	2016	2018	2019
Punjab	30.1	22.0	26.0	23.2	31.9	24.1	30.2
KP	15.9	16.9	13.8	15.0	17.1	9.1	14.3
Sindh	23.0	13.6	17.6	14.1	17.3	7.4	25.2
Balochistan	8.4	5.4	9.8	8.9	9.0	11.1	15.4
AJK	26.8	26.7	21.3	17.7	9.9	24.1	37.6
FATA	11.8	13.1	13.6	8.0	13.7	4.8	5.5
Gilgit-Baltistan	27.3	19.2	21.2	16.0	24.0	17.6	29.7
Islamabad - ICT	41.9	27.8	54.3	26.9	37.0	43.7	52.3

6 Evidence on Effective Teaching

6.1 Introduction and overview

This report has identified that many children in the Punjab, particularly from certain backgrounds, are not only more likely to be out of school, but even if they are *in* school, they are also more likely to be disadvantaged in terms of their learning outcomes. This double disadvantage limits the extent to which education can fulfil their learning potential. Understanding why learning levels remain low, especially for particular groups and despite many large-scale reform efforts, is therefore a crucial question for the Punjab. Existing research, both internationally and within Pakistan, has consistently pointed to teachers being one of the most crucial input into a child's educational experience (Hanushek and Woessman, 2011; Aslam and Kingdon 2011) with ineffective teaching being one of the most crucial factors driving large learning inequalities.

The evidence with regards to teacher attendance shows a mainly positive picture with teacher attendance rates (in mainly rural) Punjab averaging more than 85% of the teachers found in school on the day of the visit and showing consistency over the years. The data also reveal a sharp upward trend in government teachers with at least a graduate qualification in the Punjab during the 2012-2019 period. EMIS data reveal similar trends and also show that on average, a government school teacher in the province has about 8-9 years' experiences in the sampled school and 14-18 years' experience as a teacher in the School Education Department, with a recent decline in 2018 indicating new teacher recruitments.

Limited data has revealed that teachers in the Punjab are not always well prepared to address the challenges they face in their classrooms. A large percentage of sampled teachers have reported that their pre-service training did not provide them with any training for multi-lingual settings (47%), diverse classrooms (47%), working with poor children (44%) or children with special needs (58%). In addition to this, the data also reveal that not only are teachers not fully competent themselves in teaching the curriculum they are meant to be teaching to Grade 3-5 pupils, but often they are also not fully able to transfer their knowledge to their students. Data from classroom observations in 2018 further shows that while teachers are able to maintain a positive class environment, they do not show use of instructional techniques and socio-emotional skills, with public school teachers performing better than those in private and PEF schools.

It should be noted that there have been important recent developments in the collection of information on teacher effectiveness, implemented by QAED with support from World Bank funded TA. An app-based Classroom Observation Tool (COT) was rolled for use by AEOs to collect data on 11 teaching practices. Classroom observations of teachers allow measuring the impact of training programmes and other interventions (and subsequently their impact on pupil learning), allow benchmarking the performance of schools and school systems in aspects such as teachers use of learning materials, their time on task, student engagement etc. and provide school leaders with formative feedback for teachers[30]. Since then data from the COT has been used to identify teacher weaknesses and needs to inform the new CPD system.[31] A blended model is being used to deliver modules to primary teachers on these 11 teaching practices. The COT can potentially be used to

[30] https://www.worldbank.org/en/programs/sief-trust-fund/brief/conducting-classroom-observations
[31] Oxford Policy Management (OPM), 2021. *Education Policy and Reform Review: Supplementary Report for Performance Evaluation of PESP2.*

measure the impact of such in-service trainings. However, no time series data is yet available from this source to allow an assessment of teacher effectiveness to be made.

6.2 Data sources and quality

6.2.1 Overview

We discuss teacher effectiveness principally using data from ASER and EMIS over the 2012-2019 period. The Nielsen data set provided only subjective perception-based data on school and teacher quality and therefore due to the nature of this data, robust conclusions cannot be drawn in relation to how PESP2 has influenced schooling or teacher quality (via inputs). The school-based learning data sets available to us (LND and DFID 6MA data) did not collect any information on teacher quality. However, well-designed instruments that collect data on critical aspects of teacher effectiveness for those teachers who teach the pupils being assessed can be a useful addition to assess programme effectiveness. Our primary analysis, is supplemented by reported cross-sectional data from TEACh, SABER SB and PEC PASL.

The available data relating to teaching effectiveness include teacher attendance, percentage of qualified teachers, teacher experience in a given school and the average student-teacher ratios. For the purposes of this current analysis, the available indicators act as proxies and provide indicative information about that traits we consider to be important. Teacher attendance is important in itself as students do not learn from absent teachers. It also provides an indication of the commitment and motivation of teachers as more motivated teachers could be expected to be absent less. The percentage of teachers who are qualified and teachers' experience provide information about teachers' skills, but only as proxies. Reported cross-sectional data on teacher competence, teacher training and teaching practice in the classroom is used to supplement this analysis (see Table 50 Data sources, indicators and definitions (effective teaching), providing more nuanced indicators for teaching effectiveness. We do not observe skills directly and without skills tests we need to assume that teachers obtain the necessary skills in the process of becoming qualified and that teachers get better at their job the longer they practice. It is important to consider how the variables measured relate to what is really important – how good teachers are at teaching.

As with learner preparedness, these indicators do not show us how good teachers are in the classroom (this requires expert observation over a sustained period using classroom observations conducted by trained enumerators and using standardised measures). Whilst classroom observations are expensive and time consuming, conducting these to collect relevant information on teacher effectiveness is increasingly being advocated in policy and research. Classroom observations of teachers allow measuring the impact of training programmes and other interventions (and subsequently their impact on pupil learning), allow benchmarking the performance of schools and school systems in aspects such as teachers use of learning materials, their time on task, student engagement etc. and provide school leaders with formative feedback for teachers[32]. The SABER SD exercise has carried out classroom observations in 2018 and the preliminary evidence provides some useful insight into teaching methods.

[32] https://www.worldbank.org/en/programs/sief-trust-fund/brief/conducting-classroom-observations

Table 50 Data sources, indicators and definitions (effective teaching)

Indicator proxying 'teacher effectiveness'	Data Set	How it is defined
Data directly analysed:		
Teacher attendance rate	ASER (2012-2019)	The ASER school observation sheet records number of appointed teachers and number of teachers that are present on the day of the survey, as observed by the enumerator. Teachers here include head teachers, regular teachers and community/part-time/contract teachers. The teacher attendance indicator has been calculated through the following formula: Teacher attendance = (headcount of present teachers / headcount of appointed teachers)*100
Percentage of qualified teachers	ASER (2012-2019)	% distribution of teacher type by category (i.e. percentage of teachers reported as having a Matric qualification, Inter qualification etc.). For instance, under the Matric column, the following formula has been used: % of teachers with matric qualification = (total number of teachers with matric qualification / total number of educational qualified teachers)*100
Teacher experience	EMIS (2012-2018)	Average years of experience post appointment in current school and in the School Education Department overall.
Student teacher ratio	EMIS (2012-2020) PSC (2011; 2016)	Student to teacher ratio in the school for each type of school. This is calculated by the following: Student teacher ratio = Total students in the school/total teachers in the school
Data not directly analysed but sources from reports:		
Teacher competence	TEACh (2016/2017) SABER SD (2018) PEC PASL (2018/2019)	Teacher competence measured by assessing teachers' ability to spot pupil mistakes and content knowledge of material they teach (primary grades)
Types of training received	TEACh (2016/2017)	Content of training received assessed by asking whether they received training on specific elements (teaching diverse pupils, multi-grade and multi-lingual settings etc.)
Teaching practice	SABER SD (2018) PEC PASL (2018/2019)	Assessment of good teaching techniques defined as positive classroom culture, instructional methods and socio-emotional skills through classroom observations; Role of teacher behaviour in the classroom on student scores

6.2.2 Annual Status of Education Report

ASER data sets contain a more detailed collection of inputs through the school-level surveys (for government and private schools) and provides important data on the following (government):

- Numbers of teachers (no distinction by gender, some by sanctioned posts and filled posts)
- Teacher qualifications (both education and professional)
- Teacher attendance (as measured by enumerator on the day of the survey)
- Teacher training (number of days of training received by number of teachers within last year)
- Classroom observations indicating incidence of multi-grade teaching (more than one class sitting together in one session)
- Whether listed facilities are available in the school or not (yes/no responses)
- School funding (type of funding, whether received or not, amount received and amount spent, activity on which funding was spent).

Whilst ASER data mostly cover rural areas (with some urban areas covered between 2012 and 2019), the schools and resultant inputs data are available on approximately 1,700 schools (two thirds of which are government schools and around 90 percent rural). This data set provides a good starting point for examining input indicators over the time period of interest. Additionally, the fact that learning outcomes of pupils within households may be linked to inputs and school-level variables allows for a more nuanced analysis of key factors that may influence learning.

6.2.3 Education Management Information System and Private School Census

EMIS and PSC are administrative data sets that gather data on all public and private schools, respectively, in Punjab. The teacher module in the EMIS collects data on teacher professional history such as qualification, post, grade, appointment within the School Education Department along with any changes over time. This allows us to estimate teacher experience and the student-teacher ratio. The PSC is comparatively a shorter exercise and collects aggregate number of total teaching staff by gender and qualification (inter, graduation and masters). This allows us to calculate the student-teacher ratio in private schools.

6.2.4 TEACh project data

In addition to these data sets, we have also used data from the TEACh project focusing specifically on effective teaching that has been collected data in three districts of the Punjab. This data set allows us to provide evidence on the extent to which teachers report being ‘prepared’ during their in-service training on challenging classroom situations they are likely to commonly face (such as teaching diverse groups of children, teaching multi-grade and multi-lingual classrooms, children with disabilities etc.). In addition to this, the data also reports on teacher competencies as captured by assessing their ability to mark student work given and comparing this to student assessment outcomes to identify the extent to which teachers are competent in the material they teach and to what extent they can translate this knowledge to their pupils.

The ASER and EMIS data sets do not provide information on measures that are always fully able to capture teacher effectiveness. In this regard, TEACh data are far more suitable by being more comprehensive and nuanced (along with SABER and PASL discussed below). Additionally, to fully capture teacher effectiveness and its impact on student learning, it is important to be able to link a given teacher who teaches a student to her student. ASER and EMIS data are unable to do this. TEACh data, on the other hand, is able to achieve this but its greatest limitation lies in being non-representative of the Punjab as it only captures information from three districts. It is also cross-sectional data and available only for 2016/2017 (albeit with students assessed at the beginning and the end of the school year which allows for a value-added model to be estimated).

6.2.5 SABER Service Delivery

As a part of a larger exercise to assess the learning crisis in Punjab, SABER SD studies the role of teachers in this equation. Similar to ASER, an enumerator makes an announced visit to sample schools, recording the teachers present in the school and in the classroom teaching. The teacher module contains information on professional history, along with an assessment of teacher content knowledge and pedagogy (in Mathematics and language of instruction). Furthermore, an open source tool for classroom observations, called Teach[33], is used to measure both quantity and quality of teaching (classroom culture, instruction, socio-emotional skills). While this data is representative of all schools (public, private and PEF) in the province and provides more comprehensive data then ASER and EMIS, it is only available for 2018. Preliminary findings from the initial data release are discussed in this section.

6.2.6 PEC's Provincial Assessment of Student Learning

The Punjab Examination Commission's (PEC) Provincial Assessment of Student Learning (PASL) 2018-2019 explores the link between student scores and background factors – home, school and classroom level – on student learning. The classroom level factors explore teacher behaviour, teaching practice and support for students. The focus of this exercise was Grade 4 learning in Mathematics, Science and English. Data was gathered through a student and teacher assessment in each subject. Data was also collected from students, parents, teachers of each respective subject and head teacher in each school. The sample consists of 18 randomly selected districts, 10 school per district and 25 Grade 4 children in each school. This sample is representative of Punjab, and only available for one year. Reported figures in their published report are discussed below.

6.2.7 Challenges in measuring teacher effectiveness

Researchers have been grappling with trying to understand what constitutes 'effective teaching' for several decades with limited success (see Aslam and Kingdon 2011). Despite the overwhelming consensus on the importance of teachers to a child's educational experience, there is an equally large body of evidence acknowledging the difficulty of measuring 'teacher effectiveness'. This problem stems from the fact that 'teacher quality' encompasses numerous competencies, skills, motivations, and attitudes etc., many of which simply cannot be observed. In addition to this, how the teacher interacts with an individual student and groups of students within the class remains unobserved by all not present in the classroom. More robust econometric studies have made

[33] https://www.worldbank.org/en/topic/education/brief/teach-helping-countries-track-and-improve-teaching-quality

attempts at identifying teacher quality. One example is a study in Lahore District in Punjab by Aslam and Kingdon (2011) which notes that the 'teaching process' within the classroom (rather than teacher qualifications, training – resume' characteristics that are typically used for recruiting and rewarding teachers) determine teacher quality (as measured by improvements in pupil learning). In a similar vein, using data from rural schools in the Punjab, Aslam, Rawal and Jamil (2013) note that whilst teacher observable characteristics have a limited impact on student outcomes, teacher's subject matter knowledge and attitudes to teaching matter more in determining student outcomes. However, undertaking such nuanced analyses requires very rich data – such as large-scale data that observes teachers' time on task or observes her teaching within a classroom' or data that can assess teachers' competencies and subject matter knowledge or assess student mistakes. These kinds of variables do not exist in the data sets available to us. Only preliminary findings from the SABER SD study provide such information for one year.

Teacher attendance rates and qualifications only provide very crude proxies of teacher characteristics that might equate to 'effectiveness'. Arguably, teacher attendance is a proxy of effectiveness in that it proxies for teacher 'effort' through presence in school. The way the data are collected on this particular measure, as with pupil attendance, is also superior to asking teachers or headteachers to report on attendance. As with the pupil attendance measure, it only captures a 'snapshot' measure of teacher attendance on any given day and may not capture more systemic absence for teachers which may arise due to them being absent due to election duties or such activities or even during harvesting season. It is also worth noting that there are many other ways in which a teacher can apply effort, turning up to school and to her class to teach is clearly one of them (and that may, in turn, depend on numerous other factors such as transport issues, having to look after dependents, health issues etc.). Teacher qualifications also provide a very crude measure of effectiveness in that research has consistently shown qualifications to not matter for pupil learning (Aslam and Kingdon 2011 and Aslam, Rawal and Jamil, 2013 using data from the Punjab show this to be the case). Nevertheless, a minimum level of teacher qualifications is necessary to ensure a cadre of teachers with the necessary skills and competencies to teach their students. Where teachers lack these qualifications, effective training interventions (at the pre and in-service levels) can be used to improve the quality of teaching.

More useful measures of 'effectiveness' would, therefore, capture teacher competency, the teaching process within a classroom and teachers time on task to actual activities within (and outside) a classroom and be able to link it to pupil learning gains effectively. Preliminary finds from SABER SD's classroom observations, providing limited data on teaching practice and methods in the classroom but this is only available for one year. The PEC PASL and TEACh study also link student learning to teacher competence, training and behaviour. More ideal measures would, therefore, capture the effort teachers apply when in school (in engaging students in the classroom for example) and the effort they put into planning and marking student work, over multiple rounds. Without knowing about the extent of this effort by teachers, absence rates and qualifications themselves do not provide nuanced proxies of teacher effort.

6.3 Commentary on trends

This section proxies 'teacher effectiveness' through the indicators outlined in Table 50, whilst recognising that these indicators form a very rough proxy of 'teacher effectiveness.'

6.3.1 Teacher attendance

Teacher attendance rates in the Punjab average more than 85%

Teacher attendance rates form a crude proxy for teacher motivation with researchers arguing that high rates of teacher absence pose a serious obstacle to the delivery of education[34]. In South Asia, it has been argued that the problem is often not simply one of low-quality teaching but one of no teaching at all (Dhundhar et al. 2014). High teacher absence can often lead to very direct and immediate consequences for learning by resulting in unplanned multi-grade teaching and thereby reducing the stability of the teacher and the taught match with direct negative consequences for child learning levels (Kingdon and Banerji 2009). According to some estimates, an additional increase in teacher absence by 5% can reduce student learning by as much as 4-8% over an academic year (Das et al. 2007).

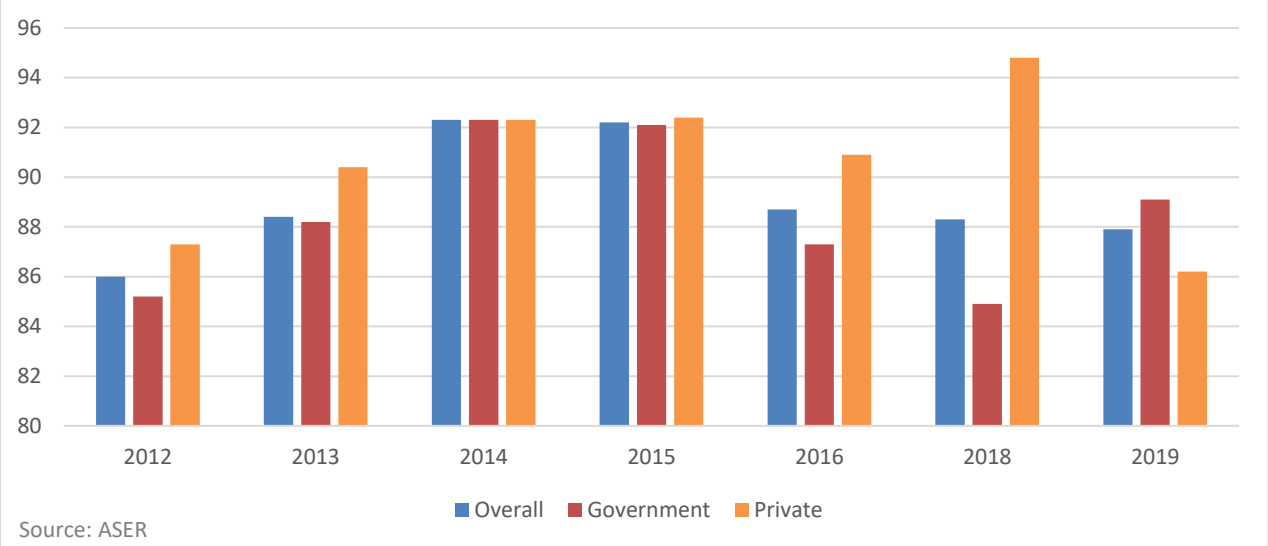
The percentage of teachers who were reported as being present in school on any given day the school was visited by the enumerator are reported in Figure 38, Figure 39, and Figure 40 illustrating attendance rates by school type (government versus private schools), by school gender (girls only, boys only or mixed) and by location (rural versus urban). A few notable findings from this data suggest:

- Teacher absence rates are not overwhelmingly high – a more than 89.1% (average) of all teachers in the sample regardless of school type, location or gender of school are found in the schools as reported by enumerators.[35]
- The attendance rates are fairly consistent over the years with minor variations.
- There are no very noteworthy differences across the different disaggregations.

The SABER SB differentiates between school and classroom absenteeism in Punjab and finds that while 18% of teacher are absent in the classroom, 14% of teachers are not present in the schools in 2018. This suggests that teacher presence in school does not always indicate that the teacher is also present in the classroom and teaching.

[34] It is fairly common practice to proxy teacher motivation using absence rates in South Asia, e.g. Mohsin and Zafar (nd).
[35] There is some evidence from the Punjab that has suggested that the decline in teacher absence in the Punjab is due to the internal and external monitoring of teachers conducted by the Program Monitoring and Implementation Unit, PMIU (Mahmood et al. 2012).

Figure 38 Teacher attendance rate (%), by school type



Teacher attendance is a relatively poor proxy for teacher motivation. Teacher attendance is likely to be influenced by a variety of factors including and not limited to transport, responsibilities at home, health and often official duties (such as election duties) that take teachers away from their classrooms. The data sets reported here do not provide additional information on reasons for teacher absence but some analysis from Pakistan using another data set has revealed that the majority of the teacher absence, when probed further, was either 'unexplained' or due to teacher reported illness, rather than attributable to official non-teaching duties (Aslam, Jamil and Rawal, 2011). Nevertheless, teacher absence has been noted as '…one of the most serious forms of corruption in education.' (Patrinos, 2013).

Figure 39 Teacher attendance rate (%), by school gender

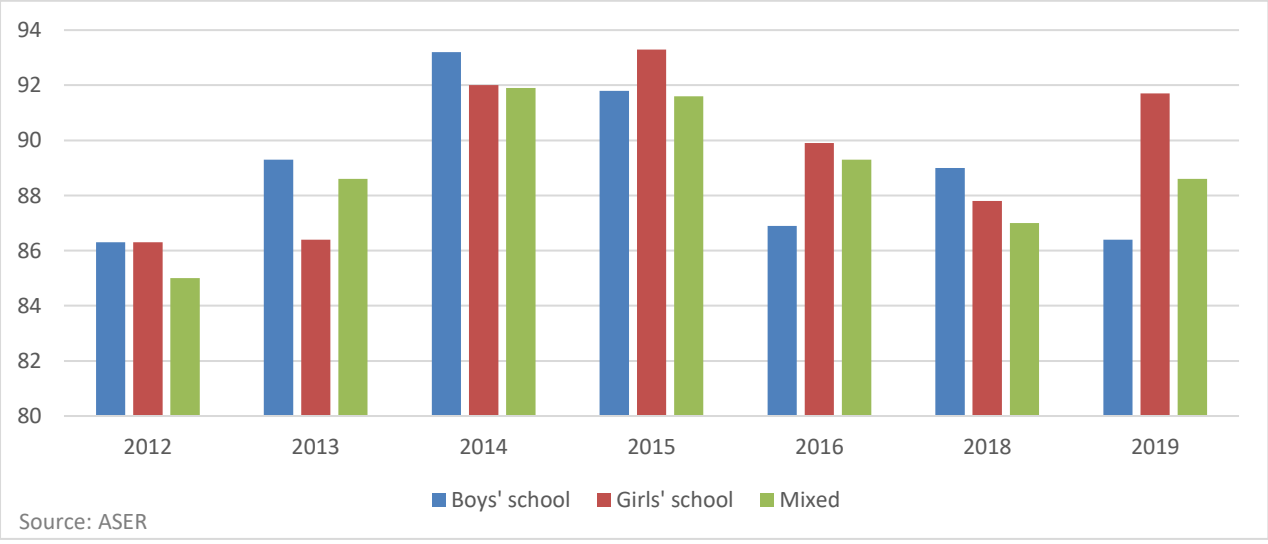
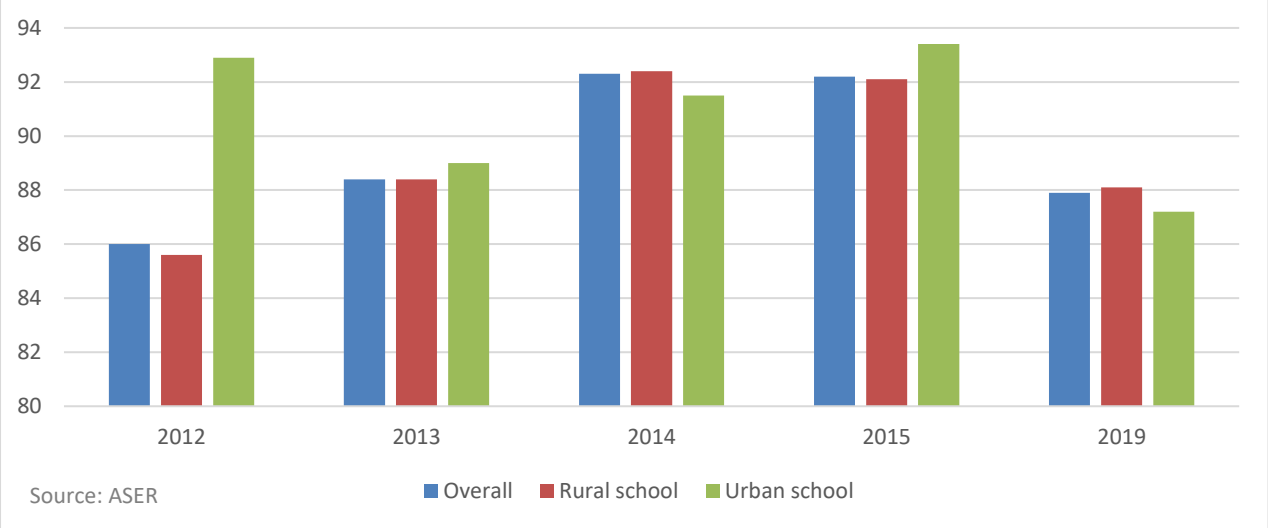


Figure 40 Teacher attendance rate (%), by location

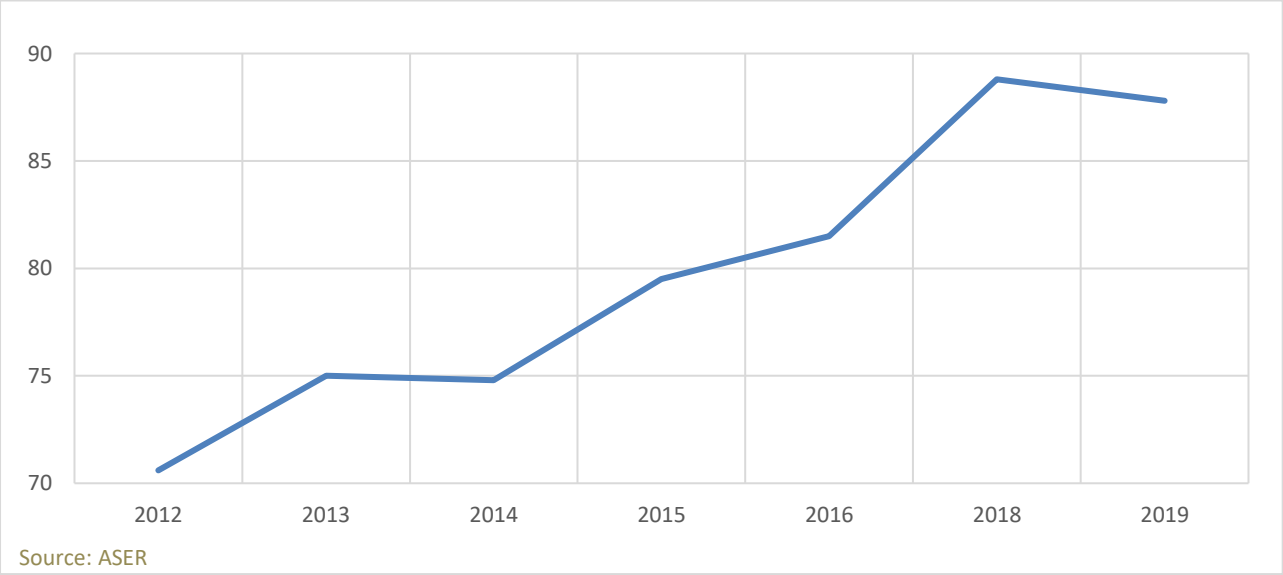


6.3.2 Teacher qualifications

There are an increased number of qualified teachers in Punjab over time

ASER data also provide another crude proxy of teacher effectiveness through the percentage of teachers with different qualifications. Tables in Annex E summarise the various qualification levels of teachers across different types of schools in the Punjab. Figure 41 uses the underlying data in the tables to present the percentage of government school teachers with at least graduate qualification over the years (sum of % of teachers with graduate, masters and post-graduate qualifications). The upward trend is very clear between 2012 and 2018 – government schools in the Punjab reflect an ever increasing number of teachers with at least graduate qualification. Between 2018 and 2019, there is a one percentage point decrease with an estimated 87.8% of sampled government teachers having a graduate qualification or more in 2019. The SABER SD study further finds that teachers in private and PEF schools are less qualified (and less well paid) than those in public schools.

Figure 41 Government school teachers (%) with at least 'graduate' qualification



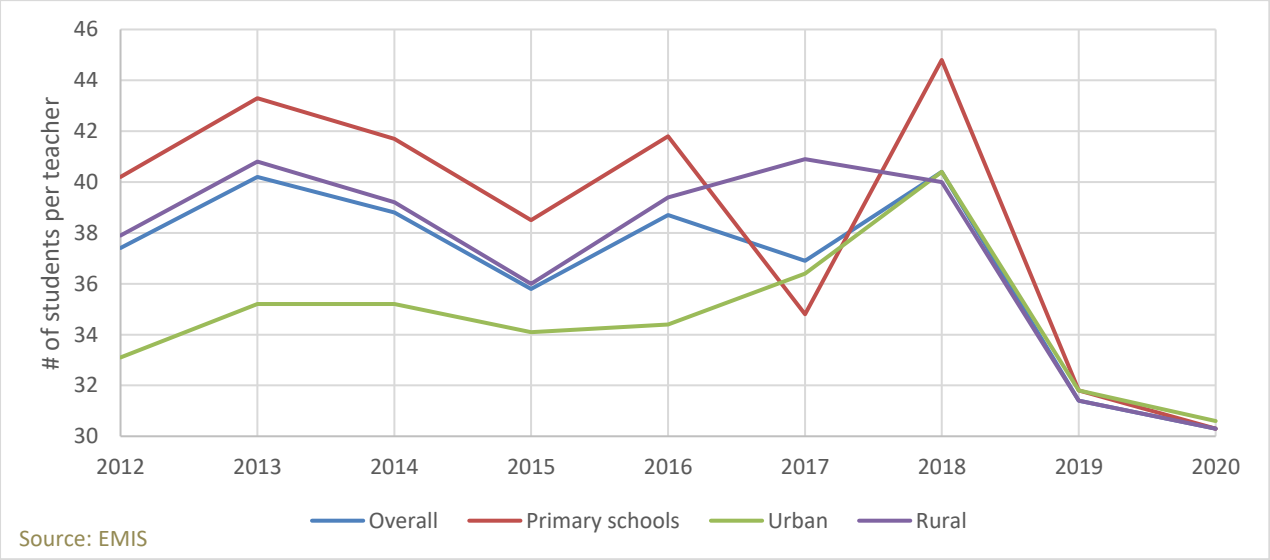
Along with reporting on teacher qualifications, there is also additional information available on teacher experience in the EMIS data (Annex I). The data reveal that, on average, government school teachers in the Punjab have about around 8-9 years' teaching experience (2012-2018) in the sampled school and around 14-18 years in the School Education Department in the same period. Average experience has decreased in 2018, indicating new teacher recruitments. This decrease in teacher experience, in combination with an increase in STR (discussed below) may affect the quality of teaching in government schools, depending in particular on how skilled are the many newly recruited teachers.

6.3.3 Student-teacher ratios

Student-teacher ratios have fluctuated and decreased since 2018

Figure 42 illustrates the trend in student-teacher ratios (STRs) with larger numbers of children in any given classroom likely to negatively impact a teacher's ability to effectively teach (though the evidence on the relationship between effective teaching and class-sizes and STRs is mixed). Generally, the STRs in Punjab's public schools are not exceedingly high though they are higher in primary schools (as compared to middle, high and higher secondary schools) and higher in rural areas (reflecting resource differences). This trend of higher STRs in primary schools and rural areas is also evident in private schools (0), whose average is around 21-22 children per teacher overall (26 children per teacher for primary schools specifically) in 2011 and 2016, according to the PSC.

Figure 42 Student-teacher ratio in government schools in the Punjab



Given the government of the Punjab prescribes STRs[36] at the primary level to 1:40, the trend in government schools suggests STRs are now below the prescribed standard. One caveat in these findings is that the STR ratio from 2019 and 2020 exclude public private partnership schools that might arguably represent the most resource constrained public schools. Moreover, low STR in 2020 might also be driven by lower enrolment for the 2020-2021 academic year.

[36] According to the 2014 Reallocation of Teaching Posts policy (SED, 2014).

6.3.4 Teaching skills and practices

Small-scale data from three districts reveals that teachers in the Punjab are not always well prepared to address the challenges they face in the classrooms

In addition to these data that provide only crude proxies of teacher effectiveness, TEACh data (2016/2017) provide far superior measures of 'teacher effectiveness' albeit in only three districts of the Punjab. This data set captures more nuanced measures of 'teacher effectiveness' e.g. not simply by estimating percentage of trained teachers but identifying the extent to which they have received training on aspects such as child psychology, multi-grade classroom settings (when learners of various age and grade levels sit together), working with diverse classrooms and children with particular needs. Table 51 identifies the responses from the sampled teachers from this data set. It is clear that teachers in the Punjab faced a diverse set of experiences in their pre-service training with respect to topics covered with a very large percentage reporting receiving no training for multi-lingual settings (47%), diverse classrooms (47%), working with poor children (44%) or children with special needs (58%).

Table 51 Pre-service training by topic - Punjab (% of teachers)

	None	One session	Several sessions	One term
Child psychology	3	47	35	15
Multi-grade teaching	11	52	32	5
Multi-lingual classroom	47	30	19	4
Slower learners	17	45	27	10
Children with special educational needs	58	30	11	2
Poor children	44	34	20	3
Diverse classrooms	47	41	11	1

** All teachers interviewed responded to each of these categories. The total number of teachers interviewed was 121. Source: REAL Centre and IDEAS (Mimeo), University of Cambridge and IDEAS.*

A larger majority of sampled teachers in the TEACh data from Pakistan reported being trained at least in one session or more on teaching in a multi-grade setting – with 11% reporting receiving no pre-service training on this aspect, 52% reporting at least one session etc. This is an important finding when discussing 'teacher effectiveness' in the context of the Punjab. ASER data have consistently revealed that multi-grade environments continue to be the norm in the country (

Table 52). In Punjab, for example, the reported extent of multi-grade classrooms at the Grade 2 level as 29% in government schools in 2016 (compared to a national average of 59%). This suggests that a very large proportion of children in Punjab are taught in settings where children of various age groups and grade levels are seated together due to a lack of sufficient teacher numbers (either due to teacher absence or simply due to deployment and recruitment issues). On the one hand, it is worth noting that for numerous children in the Punjab, small multi-grade environments may be the only type of school to which they can gain access. On the other hand, when multi-grade teaching arises due to necessity rather than choice of pedagogy and is not accompanied by effective teacher training, it is likely to have a detrimental impact on pupil learning (Rawal & Aslam 2015). The instability in grade-grouping configuration combined with ill-trained and ill-equipped teachers is likely to reduce the effectiveness of teaching in a given classroom setting.

Table 52 Multi-grade teaching observed (%) in Grade 2 classrooms (ASER Rural)

	Government Schools	Private Schools

Region	2015	2016	2015	2016
National	48.0	59.0	30.0	40.0
Balochistan	57.0	59.0	26.0	40.0
Punjab	39.0	29.0	33.0	28.0
Sindh	81.0	29.0	35.0	28.0
KP	33.0	27.0	11.0	10.0
FATA	37.0	31.0	5.0	2.0
GB	38.0	32.0	36.0	28.0
AJK	52.0	56.0	40.0	47.0
ICT	17.0	0.0	50.0	8.0

Source: Aslam et al. (2018), OIC country study

Limited evidence suggest that teachers are not always competent and able to transfer their knowledge on to their students

TEACh, SABER SD and PEC PASL provide additional information that better captures 'teacher effectiveness' than that available in the ASER data set. One such measure is 'teacher competence' or a teacher's own knowledge and ability when teaching children. Poor teacher competence has been known to be a fundamental barrier to pupil learning with research in India and Pakistan consistently finding strong links between teacher competence and student learning (Aslam and Kingdon 2011). Previous surveys in the Punjab have also found that teachers are especially lacking in basic subject knowledge and pedagogical competencies (how to transfer knowledge to students) (see Dhundar et al. 2014 and Rawal and Aslam 2015). The TEACh project also assessed teacher competence by asking sampled teachers to 'mark' pupil work on literacy and numeracy tests to assess their ability to spot student mistakes as well as their own content knowledge of the subject they taught. Table 53 presents some interesting findings from this exercise. The table is based on evidence on literacy and numeracy scores from more than 2,000 pupils and with approximately 100 teachers who were asked to mark numeracy and literacy tests. The table reports variation in teacher knowledge with teachers not achieving 100% in tests themselves (which were based on primary curriculum they are meant to be teaching). When they do have the knowledge, they do not appear to be able to transfer it well to their pupils (as reflected in the gaps between scores between teachers and pupils). Recent regression analysis from TEACh finds that teacher numeracy score is positive and statistically significant for student progress over the school year (Aslam et al., 2019).

Table 53 Means of student and teacher correct responses in learning assessments

	Literacy Scores		Numeracy Scores	
	Student	Teacher	Student	Teacher
Grade 3	13.1 (59.5%)	18.1 (82.3%)	8.8 (31.4%)	24.3 (86.8%)
Grade 4	14.9 (67.7%)	18.3 (83.2%)	13.7 (48.9%)	24.4 (87.1%)
Grade 5	16.9 (76.8%)	18.4 (83.6%)	18.0 (64.3%)	24.5 (87.5%)
All grades	14.9 (67.7%)	18.2 (82.7%)	13.3 (47.5%)	24.5 (87.5%)

Note: student scores from baseline tests with maximum score of 22 in literacy and 28 in numeracy.
Source: REAL Centre and IDEAS (Mimeo), University of Cambridge and IDEAS.

Similar findings are also observed in PEC PASL's comparison of Grade 4 students and teachers in public schools across Punjab. Overall, student performance is under 50% while teacher performance is at 78% and above (Table 54). Teacher competence in subject matter is not alone enough as evident through the gap between student and teacher performance. Their unit level analysis of

scores by subject further identifies weak points where both students and teachers need improvement.

Table 54 Mean student versus teacher score in Grade 4

		Mathematics	Science	English
Grade 4 mean score (% score)	**Student**	20.6 (41.2%)	23.1 (46.1%)	24.5 (48.9%)
	Teacher	40.1 (80.1%)	39.1 (78.1%)	42.6 (85.2%)

Note: Total of 50 per subject.
Source: PEC PSAL 2018-2019 Report

The SABER SD exercise also measures teacher knowledge of the curriculum for a sample of 3,373 primary school teachers in 812 schools (depending on what subjects are allocated to the teachers, the total assessments were 2,861 English, 2,911 Mathematics and 3,049 Urdu). Overall, a little more than half, 56%, of teacher have basic mastery of the curriculum (more than 80% correct answers in the assessment). Table 55 shows that public school teachers shows a higher basic mastery at every grade level, in comparison to teachers in private and PEF schools.

Table 55 Teacher (%) mastery of curriculum, by school type

	Public	Private	PEF
Masters the full test (>80%)	68	44	34
Grade 1 (>80%)	87	86	84
Grade 2 (>80%)	75	58	51
Grade 3 (>80%)	67	52	51
Grade 4 (>80%)	65	44	35
Grade 5 (>80%)	63	48	46
Grade 7 (>80%)	61	45	47

Source: Initial Data Release from the SABER SD survey, August 2019. Table 3.1.1: Share of teacher's mastering of the curriculum by school type (80% minimum requirement).

Limited evidence suggests that teachers are not showing good teaching practices

More that subject competency, teacher behaviour in the classroom is crucial to the learning process as evident by achievement scores from PEC. Teacher's friendly attitude, feedback on homework, support beyond the classroom, use of activity-based learning, use of learning material (white/ black board) and use of corporal punish play a role in student scores (

Table 56). These are reported raw averages. While this analysis links student learning with classroom factors, it only provides insights into the status of said classrooms (and not changes over time).

Table 56 Mean student score (%) by classroom factors

	English	Science	Mathematics
Teacher behaviour towards students			
Unfriendly	44.1	40.7	33.9
Friendly	53.5	49.3	45.9
Teacher feedback to students on homework			
Feedback not given	43.8	42.5	39.2
Feedback given	50.1	46.9	41.7
Teacher support to student problems beyond the classroom			

Do not support after class/school time	45.3	43.4	38.7
Supports after class/school time	50.5	47.1	42.0
Teachers engage students in interactive activities in the classroom			
Rarely	38.2	38.5	34.1
Often	50.2	46.9	41.7
Teacher uses white/ black board			
Never	35.3	33.1	23.5
Always	50.2	47.1	41.8
Corporal punishment			
Often	43.2	43.6	37.3
Never	53.2	46.9	43.4

Source: PEC PSAL 2018-2019 Report

Classroom observations under SABER SD provide valuable insights into the teaching in the classroom for one year (2018). The preliminary results, summarized in Table 57, reveal that while around 79% of teachers create a positive classroom culture, only 5% follow instructional techniques and less than 1% provide socio-emotional support in the classroom. The low score in instructional quality is due to the fact that a large portion of teachers do not promote lesson comprehension, check for understanding, provide feedback or support critical thinking. Similarly, socio-emotional support which includes developing student autonomy, perseverance, or promotion of socio-emotional skills in children, is largely absent from classrooms. Moreover, teachers in government schools have better teaching practices that those in private or PEF schools.

Table 57 Teacher (%) showing good practice in the classroom, by school type

	Total	Public	Private	PEF
Classroom culture	**79**	**82**	**75**	**76**
Supportive learning environment	66	70	62	59
Setting positive behavioural expectations	33	36	27	30
Providing equal opportunities to learn	89	89	90	88
Instruction	**5**	**7**	**4**	**3**
Lesson facilitation	21	28	10	12
Checking for understanding	9	11	6	5
Providing feedback	12	14	12	10
Critical thinking	2	3	3	1
Socio-emotional skills	**1**	**1**	**0**	**2**
Giving students autonomy	8	11	5	3
Stimulating perseverance	2	3	2	1
Nurturing socio-emotional skills	3	2	0	7

Source: Initial Data Release from the SABER SD survey, August 2019. Table 3.1.2: Share of teachers meeting good practice under each component by school type.

7 Evidence on Learning Focused Inputs

7.1 Introduction and overview

While the literature is divided on the extent to which physical school inputs matter for pupil achievement, the fact remains that a minimum level of inputs is needed to ensure that a child studies in a safe and conducive environment for learning and these inputs are particularly important in settings where teacher quality is low. It is also agreed that learners and teachers are likely to have a more productive and meaningful relationship when this is supported by availability of materials and other inputs – from pencils to textbooks to walls and roofs of school buildings to technology (WDR 2018). The critical element in this it to ensure that all inputs into the learning process – physical or otherwise – complement rather than hinder the teacher-learner relationship (WDR 2018). Thus, the provision of a minimum level of inputs must be combined with ensuring that these inputs lead to learning. Simply constructing a classroom or a toilet for girls or providing more learning materials may not improve learning as it does not directly affect what is happening within the classroom.

School quality remains a critical determinant of pupil learning. The Conceptual Framework also highlights the critical role of 'learner focused inputs' in determining pupil learning outcomes. The section above has highlighted one of the most crucial aspects of 'learning focused inputs' – indeed the most critical inputs – in the form of teachers. Whilst the international evidence appears to have little confidence in quantitative measures of expenditures and class sizes as major drivers of pupil, cross country patterns suggest that these inputs (such as class size, availability of instructional materials etc.) remain relevant in settings of low teacher quality. Furthermore, measures of the quality rather than quantity of inputs (and particularly teachers) remain associated with pupil outcomes (Hanushek and Woessmann, 2017).

7.2 Data sources and quality

This section analyses available data on 'learner inputs' through the indicators available in ASER, EMIS and PSC data over the 2011-2020 period, as set out in Table 58. While provisional data from 2020 has been presented, there are issues of comparability over time with this round since the sample excludes public private partnership schools (which might arguably be more resource constrained) that are represented in previous EMIS rounds.

Physical infrastructure-related inputs proxy for the indicators capturing provision of 'learner focused inputs'. These include measures such as the availability of drinking water, boundary walls, playgrounds, useable toilets, student-useable toilet ratios, condition of the school building, student-classroom ratios etc. These relate to how comfortable and safe students might feel as well as the condition and size of the classroom that might enable or restrict some teaching practices. The evidence indicates small but sustained improvements in physical infrastructure inputs in rural Punjab (ASER data) over 2012-2019. The more comprehensive school census/EMIS data from urban and rural Punjab also reports improving availability of electricity and useable toilets, but a deterioration in student-classroom ratios. There were an average of 67 pupils to one useable toilet in 2012, but this decreased to about 45 pupils to one useable toilet in 2019. Class size slightly increased from around 41 to 44 students over the same period.

Table 58 Data sources, indicators and definition (learning focused inputs)

Indicator on 'learner focused inputs'	Data Set	How it is defined	Disaggregations possible
Availability of following facility in school: Drinking water Boundary wall Toilet Playground Laboratory Computer lab Disability friendly facilities in school (2019 only)	ASER (2012-2019), based on the school-level data mainly from rural districts	The ASER school observation asks the following questions: Is there a useable drinking water facility for the children in the school? Is there a complete boundary wall/fence? Is there a useable toilet/latrine for the children? Is there a playground in the school? Is there a science laboratory? Is there a computer lab? Do you have special facilities available such as ramp, accessible toilets, health officer, others (2019 only)? The questions are coded with Yes and No responses allowing calculating of % of schools reporting yes/no to each of the questions.	By school type, level of school, gender of school, location and by province
Availability following facility in school: Electricity Drinking water Toilets Boundary wall Condition of the school building Student-toilet ratio Student-classroom ratio	ACS/ EMIS (2012-2020), all public schools in Punjab	In the ASC/EMIS survey, there is a checklist of facilities and the enumerator has to record whether each facility is a) available, b) not available or c) available but not working. The statistics below calculate % available facilities (option a). Further indicators can be computed based on available information (such as student-toilet ratio and student-classroom ratio)	By school level, gender of school and location
Availability following facility in school: Electricity Drinking water Toilets Boundary wall Student-classroom ratio	PSC (2011 and 2016), all private schools in Punjab	In the PSC survey, there is a checklist of facilities. The questions are coded with Yes and No responses.	By school level, gender of school and location

The main strength of the data analysed in this sub-section lies in the scope and coverage – both ASER, PCS and in particular the ASC/EMIS data cover very large (or all government) schools in the Punjab and allow reporting on the inputs specified above. There are some crucial weaknesses of the data. One is the limited types of inputs the data sets are able to present information on. In particular, none of the data sets collect information on availability of learning materials or textbooks per pupil. The indicators also do not provide detail on the extent to which inputs are available. For example, ASER is primarily a learning assessment and surveys only ask 'yes/no' responses on whether a boundary wall is available, whether a useable toilet is available etc. without confirming the

quality of these inputs. The EMIS data attempts to collect this information in a somewhat more nuanced manner. Additionally, some of the indicators that we have been able to compute using these data sets provide very crude and, potentially inaccurate, accounts of the reality within these schools. For example, student-classroom ratios have been estimated in the EMIS data as:

Student-classroom ratio = [total number of students/total number of classrooms]

The interpretation of this indicator depends on what is enumerated to mean 'classroom'[37] within the data set.

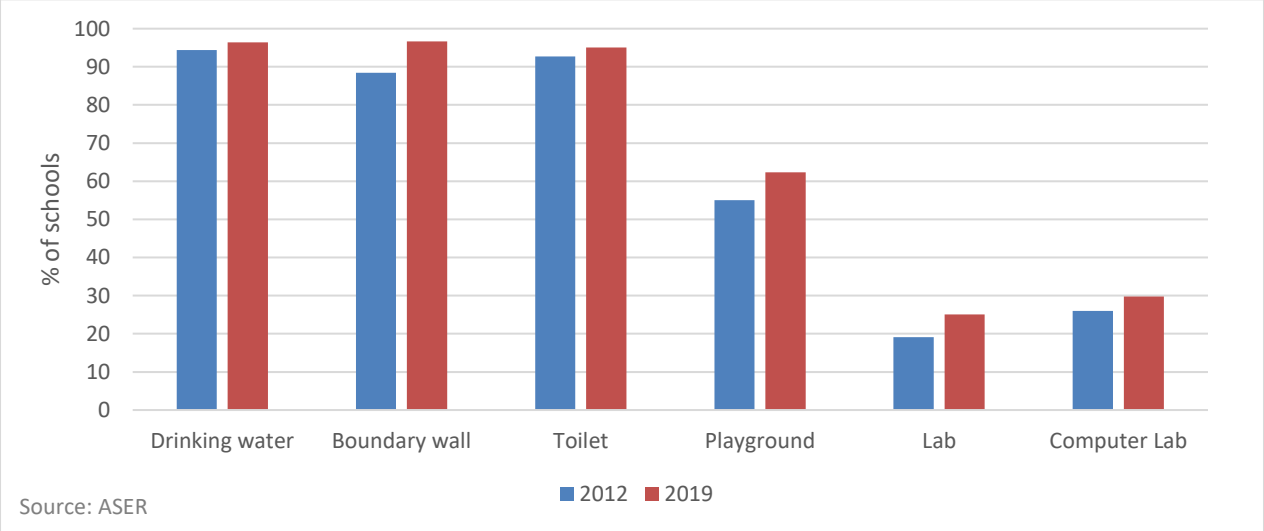
7.3 Commentary on trends

7.3.1 School infrastructure

There have been improvements in the availability of playgrounds, computer labs and laboratories in rural Punjab's schools. Almost all schools have drinking water, toilets and boundary walls.

Tables in Annex E reflect the availability of facilities according to ASER data. The status of facilities in 2012 versus 2019 is presented in Table 59 and Table 60 below whilst some key evidence is summarised graphically below. Figure 43 below depicts how key inputs availability has changed across all schools in the Punjab between 2012 and 2019. It is clear that availability of some facilities as reported in ASER data has improved.

Figure 43 Availability of school inputs (%), ASER[38]



[37] Data from EMIS 2019 and 2020 report information on 'functional classrooms' which introduces some comparability concerns with previous rounds that report information on 'classrooms.' That being said, statistics from 2019 and 2020 are more reflective of the real picture, while statistics from 2012 to 2018 have underestimated the student classroom ratio.

[38] Data has not been collected on lab in ASER 2019. Instead, lab availability data from ASER 2018 has been presented here.

Table 59 Availability of school inputs (%), ASER 2012 vs. 2019

	Drinking Water		Boundary wall		Toilet		Playground		Laboratory		Computer lab	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2018	2012	2019
Overall	94.4	96.4	88.4	96.7	92.7	95.1	55.0	62.3	19.1	25.1	26.0	29.8
School Type												
Government	93.0	96.5	83.5	97.1	90.9	95.4	61.9	69.5	21.9	25.6	25.8	33.2
Private	96.6	96.4	95.8	95.9	95.4	94.6	44.5	48.7	14.8	24.2	26.3	23.6
School Level												
Primary	93.0	95.8	83.9	96.2	88.3	93.8	45.7	57.9	3.6	9.0	6.1	12.2
Secondary	95.8	96.6	91.1	96.5	94.4	96.1	53.4	67.2	4.8	14.2	14.8	22.5
High	94.6	97.5	90.4	97.9	95.8	97.0	66.7	63.4	51.1	64.6	60.9	56.7
School Gender												
Boys	95.3	96.5	94.1	96.0	94.0	95.5	45.5	56.9	12.5	19.4	22.1	22.0
Girls	92.2	96.8	78.3	97.4	90.4	95.0	65.3	69.4	26.8	32.6	30.8	36.8
Mixed	96.1	95.9	91.1	97.5	93.3	94.3	61.5	66.7	22.4	28.9	27.4	40.0
Rural/Urban												
Rural	94.2	95.7	87.9	95.8	92.3	93.9	54.7	65.4	17.8		24.5	26.5
Urban	99.1	99.2	97.2	100.0	98.2	100.0	60.0	49.5	42.4		52.6	42.6

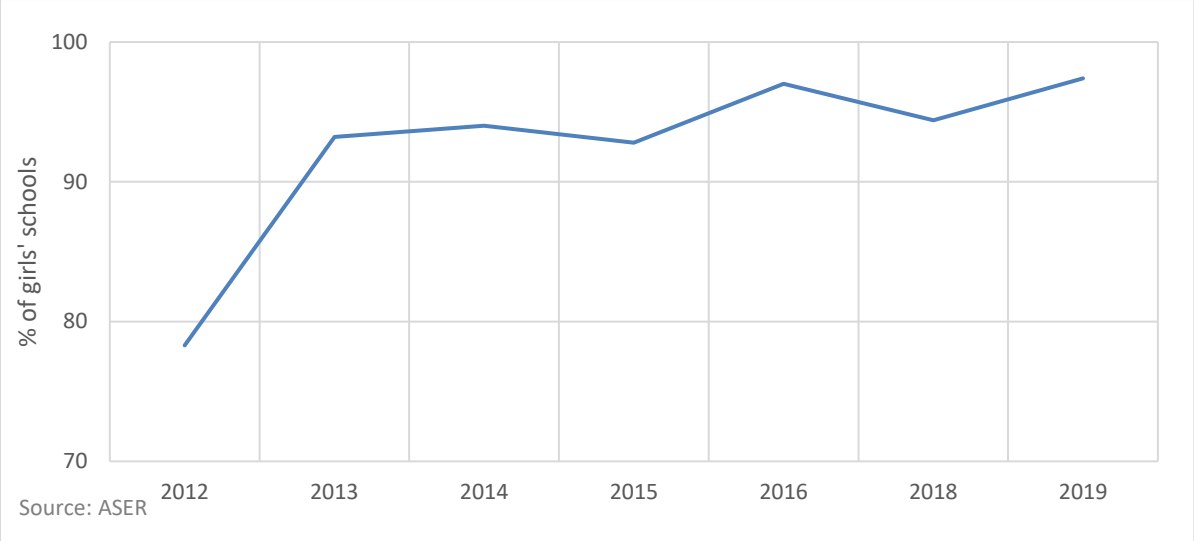
Note: Differences in school facilities in 2012 versus 2019 are significant at the 95% confidence level or above.

Table 60 Availability of school inputs (%) by province, ASER 2012 vs. 2019

	Drinking water		Boundary wall		Toilet		Playground		Laboratory		Computer lab	
	2012	2019	2012	2019	2012	2019	2012	2019	2012	2018	2012	2019
AJK	73.7	78.3	39.6	56.3	57.8	78.5	36.1	57.7	16.6	22.5	17.0	24.4
Balochistan	53.3	38.9	56.0	67.2	35.2	33.0	33.2	20.4	12.1	4.9	5.8	6.5
FATA	54.5	66.9	68.4	87.7	43.0	66.3	24.6	48.2	14.0	15.7	6.4	5.5
Gilgit-Baltistan	58.4	72.6	60.4	77.2	57.5	74.6	51.1	57.8	27.1	24.0	18.4	17.5
Islamabad-ICT	93.3	95.1	100.0	90.2	87.0	97.5	52.2	87.8	52.2	27.8	65.2	53.7
KPK	76.6	89.0	81.2	92.6	72.7	90.8	40.2	48.0	27.8	22.3	12.2	17.5
Punjab	94.4	96.4	88.4	96.7	92.7	95.1	55.0	62.3	19.1	25.1	26.0	29.8
Sindh	65.5	71.8	70.5	73.6	58.7	70.8	45.5	47.0	11.0	7.2	11.1	18.3
Total	75.0	77.2	72.7	82.3	67.9	76.3	44.1	49.6	18.8	17.6	16.5	21.3

ASER data also report improvements in the construction of boundary walls in girls' schools (Figure 44). Girls' schooling is likely to be more sensitive to the availability of this particular input due to safety concerns.

Figure 44 Boundary wall provision in girls' schools (%), ASER



However, investments in other inputs such as science laboratories and computer labs remains low at the secondary and higher secondary levels where they are likely to be more important inputs for pupil learning than at the primary level (Table 59).

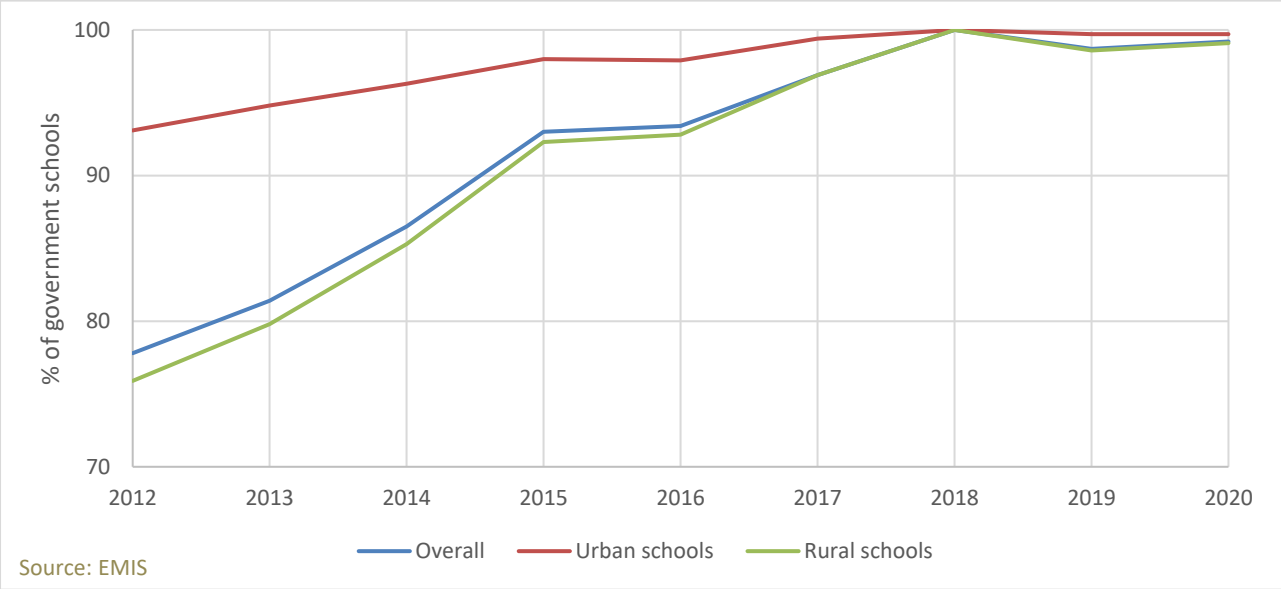
The availability of electricity in public schools has improved over time

The ASC/EMIS data covers all government schools in the Punjab across all 36 districts. In addition to reporting on some of the inputs reported by the more rural ASER survey, this data set reports on the availability of electricity, the condition of the school building infrastructure as well as allowing computations of student-toilet ratios and student-classroom ratios for schools in the Punjab.

Figure 45 reports the percentage of government schools in the Punjab reporting availability of electricity by rural/urban location. Availability of electricity across all government schools in the Punjab has been increasing; it has increased for both urban and rural schools and the gap in availability appears to have narrowed over time.

By 2018 onwards there was near to 100% availability of basic infrastructure and facilities in government schools (Annex I). The PSC data from 2016 (0) suggests that in general access to facilities and infrastructure at that time was somewhat better in private schools (availability was higher in private schools than government schools, and the number of students per classroom much lower in the private sector).

Figure 45 Availability of electricity (%) in government schools, by location

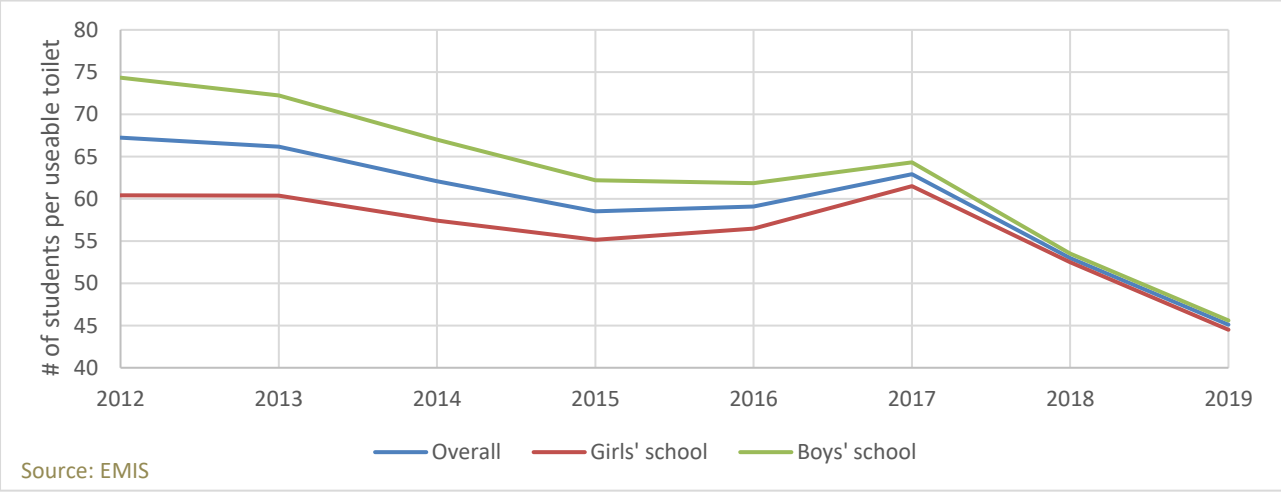


Note: Differences in electricity availability by school location are significant at the 99.9% significance level in the EMIS data set, expect for the 2018 round.

Student-toilet ratio in public schools has decreased between 2012 and 2019

EMIS data also allow us to present the average student-toilet ratio (and a more useful average student-useable toilet ratio) which is indicative of the number of pupils within a school on average who share a useable toilet, with a higher number suggesting that a large number of pupils are 'sharing' an available useable toilet. Figure 46 indicates that the average student-useable toilet ratio is high (albeit it has declined) with on average 67 pupils to one useable toilet in 2012 (as compared to about 45 pupils to one toilet in 2019). The ratio has been decreasing, but remains high. The gap for girls' and boys' schools has decreased over time to only a one person difference in 2019. However, toilet availability in itself is not enough – the SABER SD study finds that only 59% of schools have soap and water for students to wash their hands.

Figure 46 Average student-useable toilet ratio in Punjab's government schools

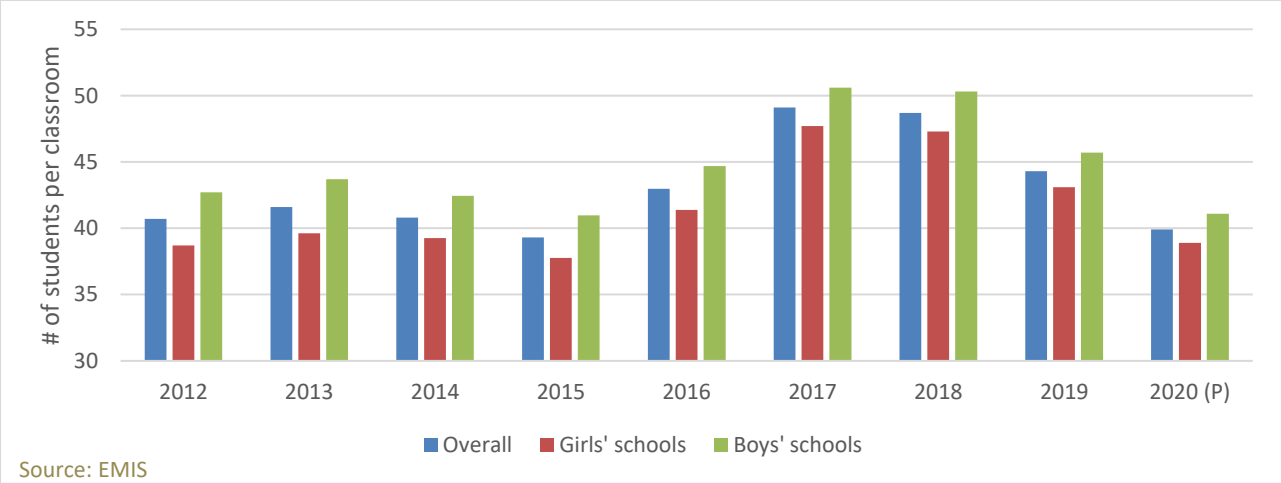


Note: Differences in student-toilet ratios by school gender are significant at the 99.9% significance level in the EMIS data set.

Student-classroom ratios have fluctuated over time and are higher for boys' than girls' public schools

Figure 47 depicts fluctuations in student-classroom ratios in Punjab's government schools. There were on average almost 41 children per classroom in 2012 and 44 children per classroom in 2019. The equivalent numbers for boys schools showed a higher ratio of almost 43 and 46 pupils/classroom in 2012 and 2019 whilst those for girls depicted a lower number (39 and 43 respectively in 2012 and 2019). Moreover, low student-classroom ratio in 2020 might be driven by lower enrolment for the 2020-2021 academic year.

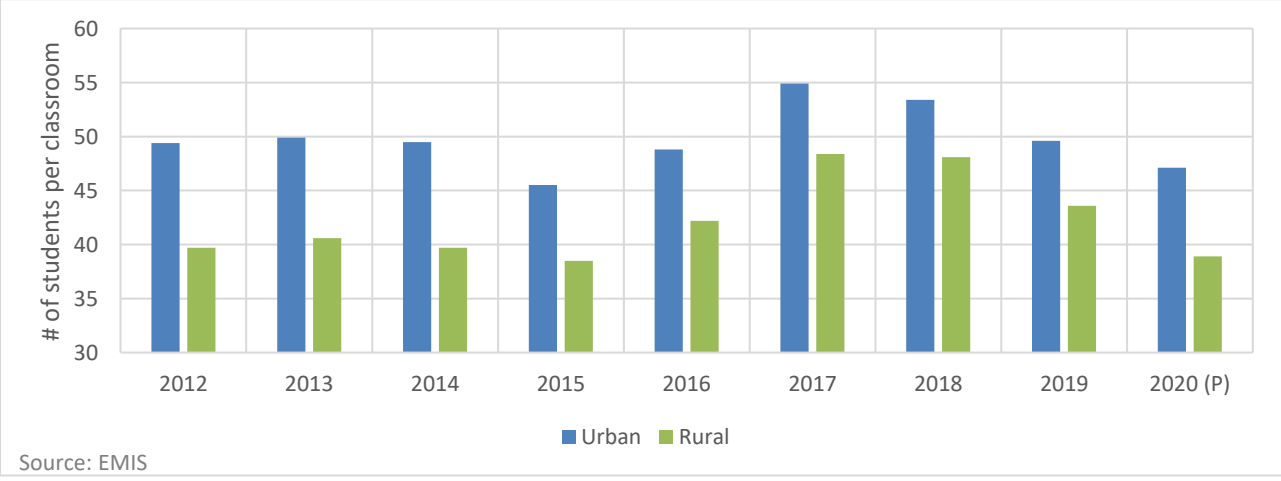
Figure 47 Student-classroom ratio in government schools, by school gender



Note: Differences in student-classroom ratios by school gender are significant at the 99.9% significance level in the EMIS data set.

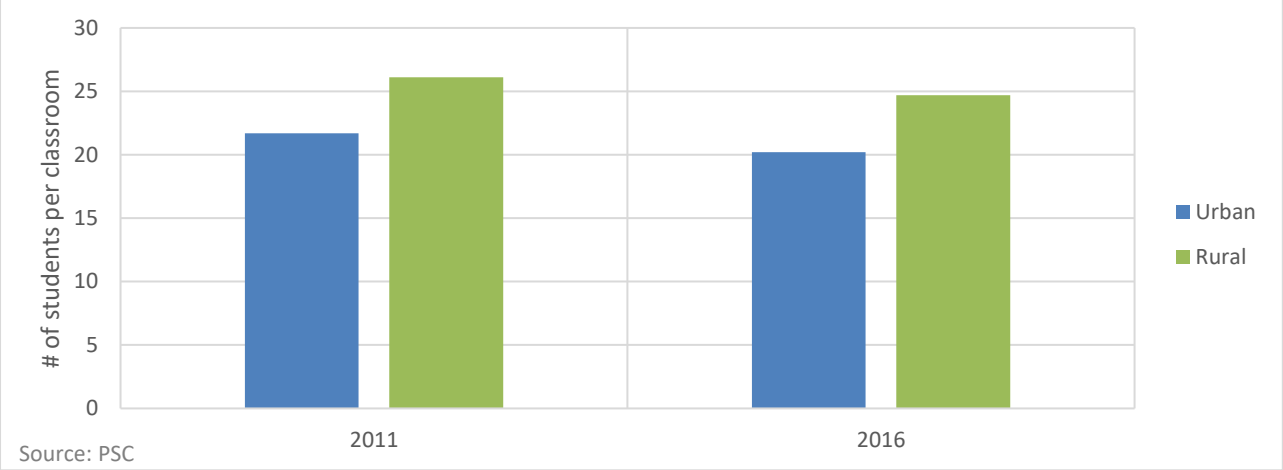
Student-classroom ratios are higher in urban areas, reflecting larger enrolments, in government schools (Figure 48). While the opposite is true for private schools (Figure 49), these schools also have a lower ratios than public schools. The SABER SD study finds that almost half of the classes in government primary schools have more than 40 students, while such classroom sizes are rare in private and PEF schools.

Figure 48 Student-classroom ratio in government schools, by location



Note: Differences in student-classroom ratios by school location are significant at the 99.9% significance level in the EMIS data set.

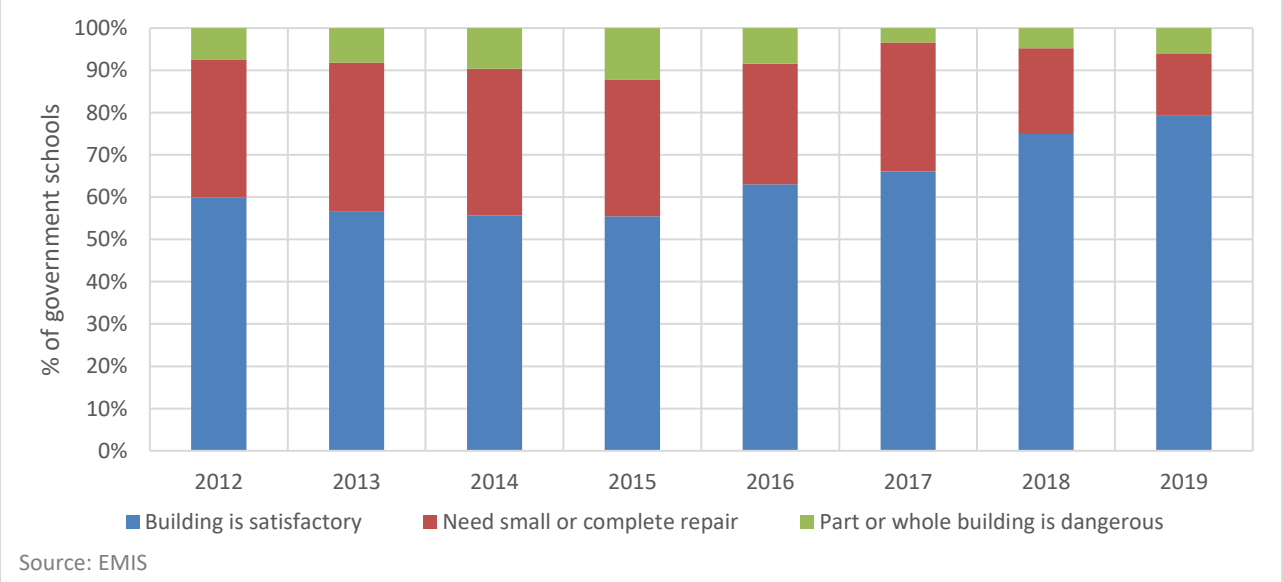
Figure 49 Student-classroom ratio in private schools, by location



Around 6.1% of government schools are classified as having "dangerous" buildings in 2019

The data also reveal that there still remain schools in the Punjab that are classified as wholly or partially dangerous in terms of the condition of the school building (Figure 50). This percentage has initially crept up over the years and declined after 2015. Being in a safe environment is critical (both for teachers and pupils) in order to make schools conducive for learning where more meaningful relationships between the teachers and learners are fostered.

Figure 50 Condition of Punjab's government schools (%)



More nuanced information is need on school infrastructure

While minimum basic facilities are present in schools, there is limited evidence on the inclusivity of school infrastructure. In order to improve access for children with disabilities, for instance, schools should be responsive to their needs. According to the latest round of the ASER data set (2019) which introduced the collection of health and disability information in the school survey, around 19.9% of schools have enrolled at least one children with disability. More specifically, the school survey sheet

records whether a schools has ramps (15.3%), accessible toilets (21.4%), health and nutrition officer (5.6%), or other facilities (15.7%) to accommodate children with disabilities, showing low overall incidence (Annex E).

There are also gaps in information available on the total school infrastructure available in Punjab. The Academy of Educational Planning and Management (AEPAM) under the Ministry of Federal Education & Professional Training publishes annual statistics on the education sector in Pakistan. While numbers on public sector instituitions are based on the provincial EMIS surveys, private and other public sector statistics are estimates based on previous trends. Table 61 Number of educational institutions in Punjab by school type, AEPAM points shows evidence of an expanding private sector and contracting public sector till 2016-17. Further information on the capacity of different institutions, especially in the private sector is needed to better understand supply side challenges.

Table 61 Number of educational institutions in Punjab by school type, AEPAM[39]

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Public	53935	53344	52986	52314	52441	52394	52390	52477
Private	43565	44765	47909	49520	49827	45453		
Other Public Sector	1876	2000	2091	2174	10675	708		
Total	99376	100109	102986	104008	112943	98555		

7.3.2 Lack of information on trends in availability of other inputs

In conclusion, it is worth noting that most of the proxies for 'learner focused inputs' within the analysis are based on physical infrastructure rather than on indicators such as availability of teaching and learning materials. Data are needed on textbook availability and provision as well as on the reallocation of resources at the school level to focus greater attention on learning focused inputs. It is also important to have data that allows researchers to establish a link between variables (such as availability of learner-focused inputs, both infrastructure and teaching and learning materials, and learning outcomes) and this requires a single data set that collects information on all these variables to allow estimation of education production function linking schooling inputs (individual, parental background, teacher and school level variables) to student learning outcomes.

[39] Number of pre-primary to higher secondary schools in Punjab has been sourced through AEPAM's Pakistan Education Statistics 2012-13, Pakistan Education Statistics 2013-14, Pakistan Education Statistics 2014-15, Pakistan Education Statistics 2015-16, Pakistan Education Statistics 2016-17, and Pakistan Education Statistics 2017-18. No further rounds of the AEPAM's reports have yet been published. Source of public sector institutions from 2018-19 and 2019-20 is ASC/EMIS data made available to the evaluation team.

8 Evidence on Skilled Management and Governance

8.1 Introduction and overview

The final element in the conceptual framework that focuses on the immediate causes that typically contribute to the 'learning crisis' is the role of 'process inputs' – management, governance and school leadership – in schooling quality. The WDR (2018) has argued that investments in physical schooling inputs as well as how those inputs are managed and governed within schools (i.e. the 'process') tend not to be guided by how they can improve the teacher-learner relationship and are, therefore, ineffective in improving learning outcomes. Evidence from various contexts supports the conclusion that schools that display better management, governance and leadership (i.e. with school heads who help teachers solve problems, set goals to achieve high learning and support them in effective ways) display better learning outcomes (WDR 2018). There is also evidence to suggest that involving communities in the general engagement and monitoring of education helps improve learning outcomes in various contexts. However, the most critical element guiding any improvements in learning outcomes is the extent to which any input into a child's learning (physical or otherwise) interacts to improve the quality of the teacher-learner interactions (Ibid).

8.2 Data sources and quality

Quality of governance and management at the school level can be assessed by looking at:

i) output indicators (such as teacher attendance, proportion of funds received and spent)

ii) process indicators (such as the quality of school leadership, ambit of autonomy and exercise thereof, school management committee/school council (SMC/SC) meetings – frequency, proceedings)

Punjab has improved its collection of data on the output indicators; the data on teacher attendance is included as part of the effective teaching chapter. Since its initiation in 2014, some data on NSB spending and utilization is tracked using head-teacher reported numbers. Real-time bank account information is not yet available. PMIU is in the process of standardising protocols and creating partnerships with banks to make this information available to them.

Some process indicators are more amenable to being tracked than others. The frequency of SMC/SC meetings is recorded as part of the ASC/EMIS but the nature of discussions and decisions taken in these meetings is less amenable to survey based monitoring. With an increased recent focus on NSB, the government aims to collect more data on SMC/SC meetings and topics discussed as well as community involvement.[40] The quality of school leadership is a complex area in itself, on which there is limited information being generated in general in Pakistan, not just by government education systems but also private systems. Some NGOs such as TCF have made progress on developing a quality of school governance index which includes ranking of principals along a range of dimensions. Such indices could offer potentially useful models for the Punjab school education department.

[40] Policy workshop "Covid-19 and its Impact on Education Delivery" organised by CDPR (January 28th 2021).

Monitoring data such as number of visit to schools by the MEAs and AEOs can be used as a proxy for governance and management, but increased frequency of monitoring visits should not necessarily be interpreted as a sign of strengthening of the system. Greater autonomy at the school level and minimally invasive presence by external monitors can enhance good practice allowing head teachers to focus on substantive tasks. Data on visits by the monitoring cadre is available with the DSD (now QAED), but was not available to us to use for the purposes of the evaluation.

Only limited and partial data is available on a few aspects of school management and governance:

- The TEACh study provides limited data from teachers on the collection and use of assessment data.
- A school leadership study covered a survey of 90 government schools chosen randomly in the districts of Lahore, Sargodha and Faisalabad. It used a survey for head teachers adapted from the Young Lives survey and TALIS. The aim was to capture dimensions of practice of school managers in government schools. The study was a comparative one with NGO schools.
- Preliminary findings from SABER SD shed light on principal knowledge of school problems (in infrastructure, student performance and teacher ability). This data is representative of all schools in Punjab and available for 2018 only.
- There is information from the ASC/EMIS on meetings of SMC/SC, and on Non Salary Budget spending.[41] This appears to be the only systematic data allowing comparisons over time. EMIS data reports on proxy indicators that are not very useful in assessing the aspects being covered in this section.

The SED has now introduced tablet-based data collection mechanisms. The School Information System (SIS) introduced in 2017, for example, allows schools to self-report data on students, teachers and facilities, including uniquely identifying each student.[42] Furthermore, an important recent initiative is the School Improvement Framework (SIF), developed in collaboration with PESP2 technical assistance by the PMIU. This framework pools information on 24 indicators over four key domains - student participation and personal development, teachers and teaching, leadership and school support, and school environment - to create a School Status Index (SSI) at the school level as shown in Table 62.[43] This data is presented in the form of a dashboard and is sourced from existing app-based data collection tools at the school level, more specifically the MEA app, LND test app, AEO app, COT app as well as the SIS. While some of these indicators have been reported in the analysis above, the evaluation team does not have access to data on the AEO, COT and SIS applications.

[41] This information has not been shared in the EMIS 2019 and 2020 datasets.
[42] https://sis.punjab.gov.pk/dashboard
[43] Oxford Policy Management (OPM), 2020. *Performance Evaluation of PESP2: Technical Assistance Update Report*.

Table 62 SIF indicators and their data source[44]

Indicators	Data Source
Domain 1: Student participation and personal development	
Student attendance rate	MEA App
Student assessment (LND score)	LND App
Student cleanliness	COT App
Domain 2: Teachers and teaching	
Teacher attendance	MEA App
Teacher allocation	SIS App
Teaching aids availability	COT App
Teacher CPD participation	AEO App
Classroom observation scores	COT App
Domain 3: Leadership and school support	
Head teacher attendance	MEA App
Non-teaching staff availability	MEA App
Instructional leadership	SIS App
School improvement plan	AEO App
School council meetings held	MEA App
NSB disbursement	MEA App
Domain 4: School environment	
Security and safety arrangements	MEA App
Dangerous buildings	MEA App
Availability of electricity	MEA App
Blackboard visibility	COT App
Availability of sufficient furniture	MEA App
Provision of toilets	MEA App
Maintenance of toilet facilities	MEA App
Availability of safe drinking water	MEA App
Availability of play area/ playground	MEA App
Cleanliness of school facilities	MEA App

The aim of this strategy is to move beyond using data to rank schools and to, instead, provide system feedback by identifying weak areas. Thus, the SSI score will generate actions for each level of district education authorities per identified school needs. The SIF was piloted in six districts in the 2019-20 academic year and rolled out in the remaining districts once schools reopened in February 2021. This has the potential substantially to improve the evidence available for managing the education sector.

[44] School Education Department (SED), 2020. *School Improvement Framework.*

8.3 Commentary on trends

8.3.1 Use of information for school management

While there is currently no systematic data available on the extent to which assessment data and other information is being used at school level to guide decision-making, the recent SIF exercise has the potential to improve evidence based sector management.

Quality of management at the school level incorporates aspects of:

- Operational practices at the school level undertaken or overseen by head teachers, such as standards of instructional practices, personalisation of instruction and learning for students, data driven planning at the school level.
- Monitoring processes and outcomes, such as existence and implementation of processes of continuous improvement for teachers, performance tracking and review, collaborative target setting.
- People management; rewarding high performers (through promotion or bonuses).

Operational standards are in place for government schools in Punjab, detailed in head teachers handbooks and teacher guides. There is anecdotal evidence of data driven planning by individual head teachers, mostly through the use of assessments, to track and identify children who are struggling to learn. PITB has instituted tablet based competency assessments for samples of students in government schools, allowing student tracking. There is potential for these data to be used for personalisation of instruction for students. There is no evidence to suggest that might be currently happening.

The School Education Department, through the Monitoring and Evaluation Assistants (MEAs), conduct monthly spot checks to government schools across the Punjab province. School performance is measured by teacher presence, enrolment and retention information, along with the school cleanliness. The LND assessment discussed earlier, is also conducted during these monthly monitoring visits. Since this data is collected on tablets, district performance data is available online real-time.[45] This data informs district performance and was rarely communicated to the school itself. Now, with the roll out of the SIF, schools will have access to real-time data on 24 indicators, as well as clear delegation of responsibility on areas of improvement. It is too early to assess the effectiveness of this platform in improving the sector management.

QAED (DSD up until 2017) was established in 2012 to introduce and implement a school-based continuous professional development program through an army of District Teacher Educators (DTEs). This program was supported by regular teacher and student assessments, which were used to inform the content of training sessions. The DTEs also monitored teachers and their pedagogical practices through classroom observations. Data from this program has not been made available by QAED. The DTEs have now been disbanded, and the tasks of teacher monitoring and capacity building has been handed to a different cadre of district level department representatives – AEOs

[45] https://open.punjab.gov.pk/schools/home/monthly_indicators

(the QAED case study has more details on this). AEOs conduct regular visits to schools to ensure that school perform well against set targets.

In surveys for TEACh, 129 teachers in 50 government schools reported that assessment data are being collected every month (93% reported this being the case) and these data are used for identifying slow or weak learners (63% reported) and where the school ranks (60% said this). While the initial infrastructure for the process is in place in government schools in Punjab, there is no convincing evidence of a systematic exercise of linking data collection and school planning or planning for learner needs.

Government teachers are appraised annually, through Annual Confidential Reports. It is unclear how far student learning targets are part of teacher performance tracking.

8.3.2 Management training and skills of head teachers

Very limited evidence suggests many primary head teachers have received no pre-service or in-service training for their role

A survey of 90 head teachers as part of a study on school leadership provides insights into the quality of school leadership and the level of preparedness of school heads for effective governance. Primary government schools do not have a designated post for a head teacher and one gets appointed for handling administrative tasks from among the teachers at the primary school. The absence of a designated post at the primary level has created a leadership vacuum (Malik and Aslam, 2017). Conversations with representatives of the Department of Education reveal that changes are being made to this policy, which will create a designated post for a head teacher at the primary level.

Table 63 Head teachers reports on areas in which training received

(% of those interviewed)	Pre-Service	In-Service
Child Psychology	35	48
Multi-grade teaching	25	48
Teaching in a multi-lingual classroom	19	25
Teaching slow learners	22	46
Teaching children with disabilities	8	7
Teaching children from poor backgrounds	22	28
School administration or head-teacher training	28	61
Instructional leadership course	19	46
Human resource management	26	46
Financial management	25	53

Source: Malik and Aslam (2017)

Furthermore, design gaps in professional development mechanisms (pre- and in-service) may have compromised the level of preparedness of head teachers in government schools (

Table 63). Fifty-seven of the 90 surveyed reported having received no training at the time of appointment to the post. While in-service training provides support, only 46% heads report having been trained in human resource or financial management – two areas of key importance for a school head teacher.

Teachers tasked with the responsibilities of school headship in primary schools were not part of the pre- or in-service training for head teachers provided by the government of Punjab. It has been recently reported, again informally, that this oversight will be amended to include primary heads as well.

Head teachers in government schools appear to have less decision-making authority than those in NGO-run schools

The notion of autonomy refers to the space for effective decision-making available to and exercised by frontline service providers. Autonomy is interpreted to mean decisions that can and are taken by heads at the school level (Malik and Aslam, 2017). The survey reveals lack of autonomy at the school level particularly for personnel management (see Table 64). Notably in comparison to the NGO schools, head teachers in government schools lack the authority to reward well performing teachers or influence their trajectory on the career progression path.

Table 64 Comparison of school autonomy: NGO and government schools

Area	Tasks	NGO	Government
School administration and planning	Developing the school improvement plans	✓	✓
	Maintaining enrolment and attendance records	✓	✓
	Maintaining teacher attendance records	✓	✓
	Establishing student disciplinary policies	✓	✓
	Deciding the structure of the school day	✓	✓
	Planning extra-curricular activities	✓	✓
Pedagogy and student related	Observing classrooms	✓	✓
	Choosing teaching and learning materials	✗	??
	Allocating students to sections	✓	✓
	Deciding who repeats classes	✓	✓
	Devising strategies for slow learners and monitoring their progress	✓	✓
Teacher management and support	Writing annual confidential reports	..	✓
	Hiring full-time teachers	✓	✗
	Hiring contract and part-time teachers	✓	✗
	Hiring non-teaching staff	✓	✗
	Nominating teachers for bonuses and promotions	✓	✗
	Managing teacher holidays	✓	✗

Note: Only those categories where more than 50% respondents identified the decision to be taken at the school level are reported here. Source: Malik and Aslam (2017)

Limited evidence suggests that principals have low understanding of school problems

The SABER SD assessed principal knowledge on the school environment, including infrastructure, student academic knowledge (Grade 4 children; language and Mathematics), and teacher ability in content, pedagogy and teaching practices. Data generated from other survey modules in the SABER SD that cover these issues was matched to principal response, showing to what extent principals know about school problems. Principal responses are then categorized within quintiles from 0-100%. Preliminary data shared in Table 65 shows that principals overestimate student performance and teacher knowledge. For instance, only 9% of principals are able to correctly estimate the level of teacher pedagogic content knowledge (within the 20% category) and instead overestimate teacher

performance by 38 percentage points. Not only are principals unaware of these constraints, but they consider low parental involvement and difficult family background to be the major barriers to learning.

Table 65 Principal knowledge (%) of teacher and student performance

	Share of principals who are right	Among those who get it wrong. How much do they underestimate the problem?
Student content knowledge	19	37
Teacher Urdu content knowledge	46	26
Teacher Math content knowledge	46	28
Teacher English content knowledge	32	30
Teacher pedagogic content knowledge	9	38
Teacher classroom practices	13	32

Source: Initial Data Release from the SABER SD survey, August 2019. Table 3.3.1: Principals' knowledge about teachers' and students' performance.

The recent SIF will send schools report cards detailing school performance overall and by each indicator, enabling head teachers to have information on student and teacher performance, and school support and environment.

8.3.3 School management committees

School Management Committees are functioning and meeting but it is not possible to draw conclusions about their effectiveness from available data

In addition to funds and infrastructure, accountability of the school can also be proxied through the existence of school management committees or school councils (SMC/SC). Table 66 reports the average SMC/SC meetings held per year. EMIS data shows that on average 8 meetings were held in 2012, and 11 in 2018. The average number of SMC/SC members has also been calculated. For example, the table below (Table 66) shows that in 2012 there were around 7 people per SMC/SC, increasing to 9 in 2018. SMC/SCs have more members and annual meetings in higher level schools (higher secondary versus primary schools; see Annex I).

Table 66 School committees in government schools

	2012	2013	2014	2015	2016	2017	2018
SMC/SC meetings annually (mean)	8.3	8.0	8.6	8.9	8.4	8.4	10.5
SMC/SC members (mean)	7.4	7.7	8.3	9.3	8.8	9.1	9.4

8.3.4 Non-Salary budget

The proportion of Non-Salary Budget (NSB) spending has fluctuated but was lower in 2016/17 than in 2011/12

Punjab introduced a Non-Salary Budget (NSB) formula to provide school funds directly to schools (rather than routing them through the district level bureaucracy) and to give greater fiscal autonomy to head teachers. The fund replaced the mechanism for development funds that were previously called the SMC funds and the amount sent to schools for this was increased. The idea is that heads will be able to respond more efficiently and effectively to school level challenges, including teacher

shortages, be able to initiate new development programmes and make the infrastructural and programmatic investments their schools need.

We use the reported expenditure and received NSB funds which the ASC/EMIS reports through head teacher's records. We use this as a proxy to teacher autonomy and willingness to spend NSB budget allocations. We report the mean percentage of expenditure as a percentage of total received funds. This allows us to see how much the school head teacher has spent out of the funds that they received. For robustness purposes, we have removed all observations where percentage spent exceeds 105%. This means that the following tables do not contain information for schools who have reportedly spent more than they have received in a year. **Error! Reference source not found.** Table 67 reports, for instance, that 48.8% was reported to be the average amount utilized by a school in Punjab in 2016/17 (financial year) spent by the head teacher (for standard deviations see Annex I). NSB information on subsequent rounds has not been made available.

Table 67 Average non-salary budget spent (%)[46]

	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Overall	77.1	45.6	61.7	78.0	64.3	48.8
School level						
Primary	77.4	45.1	60.5	76.9	60.3	49.5
Middle	75.3	48.0	65.9	77.2	62.6	52.5
Higher Secondary	76.8	47.2	65.3	85.3	80.5	50.7
School gender						
Female	75.9	44.5	61.7	75.4	61.9	48.8
Male	78.4	46.9	61.7	80.9	66.9	48.8
School location						
Urban	77.4	50.8	64.9	80.8	68.0	49.5
Rural	77.1	45.1	61.3	77.7	63.8	48.7

**This includes only those observations which are deemed to be robust i.e. the current year's expenditure does not exceed amount allocated.*

Under the COVID-19 period, schools have relied on NSB to fund compliance to SOPs as well as the printing of teaching and learning materials. The School Education Department envisions NSB playing a greater role as more authority is devolved to schools. As a result, there are aims to strengthen the monitoring and utilization of such funds by linking allocation to targets.[47] Currently, NSB disbursement is one of the indicators feeding into the SIF and is regularly monitoring through the school based applications.

[46] EMIS data from 2018 onwards made available to us does not contain data on NSB.
[47] Oxford Policy Management (OPM), 2021. *Performance Evaluation of PESP2: Education Policy and Reform Review – Supplementary Update and Review of TA Support (EPRR4) Report*.

9 Conclusions and Implications

9.1 What does evidence show about education in Punjab?

This report has examined the data sources available to assess trends in education sector performance in Punjab. These sources range from large-scale household surveys mainly collecting information on education access to school-based data sets that aim to assess children's learning outcomes in the primary years. This report has also analysed data collected by a citizens-led initiative which has collected information at a country-wide scale on both access and learning outcomes both from households and from schools. In addition to these data sets, the report has also discussed some illustrative findings from smaller-scale data sets which have collected far richer data on key indicators and aspects considered important in this report.

The report had aimed to answer specific questions and identify the extent to which specific ingredients of education system performance at the school-level might have strengthened during the PESP2 period as they relate to: preparedness of learners for school, effective teaching, the provision of learning-focused inputs and the effectiveness of management and governance. The report also aimed to identify the extent to which education participation and attainment had improved during the PESP2 period. The key findings relating to each are summarised below.

9.1.1 Has educational participation and access improved?

A larger percentage of children in the Punjab are in school but they are not always in the appropriate grades for their age

The analysis of access indicators has shown that the percentage of **children in the Punjab attending school has increased**. Participation rates have been growing over the period, which shows that children aged 5-16 years are now more likely to be attending school. While participation in schooling seems to have improved, the pattern of enrolment rates indicates that there are still many children who are not attending schooling in the appropriate grade for their age band (and this is reflected in stagnant or declining gross enrolment, and low net enrolment).

Educational access differs by location, by gender, by socio-economic status and by disability

There are differences in educational access by region (with children in rural areas accessing education far less than their urban counterparts) and for girls (with girls often less likely to participate in schooling than boys). Regardless of which indicator is used to measure access, wealth appears as a clear marker of disadvantage within the province with the rich far more likely to be accessing schooling than the poorest. The analysis of richer data, albeit from only three districts of the Punjab, also reveals that disability can be a deterrent to accessing schooling especially for the poor and for girls.

There seems to have been some success in getting the poorest into schools but not always in retaining them for the whole duration

The province has also been more successful in getting the poorest children into schools but not always successful in ensuring they enter the grades appropriate for their age and not always successful in ensuring they remain in the schooling system for the duration.

There is an increasingly larger share of school-age children in private schools

Analysis of participation and enrolment over this time period shows an increasing share of the private sector in education, across schooling levels. Mixed results are evident on the trend for the public share of education with certain data sets pointing towards a decline and others pointing towards an increase (household versus rural and census data).

9.1.2 Have learning outcomes improved?

Learning outcomes from school-based data show some improvements (2014-early 2020) with some differences by location, gender and school type

The analysis of the raw data across these different data sets for the Punjab has revealed that there have been marginal gains in learning outcomes in the province (LND/DFID 6MA) and across most competencies during the period in which data are available. There are differences by location and differences by gender and school type.

Small improvements in learning outcomes do not signify failure

The data have shown limited progress for a limited set of skills. We do not have evidence about other aspects of children's learning and development, particularly because learning is cumulative and improvements take some time to become visible. Another critical point to note is that understanding whose learning is being assessed becomes all the more important because if more disadvantaged children enter school and are assessed, the chance of observing major improvements in learning over time is limited. The success lies in getting these children into school, followed by retaining them long enough in the system to show meaningful improvements in learning. This remains a critical weakness of both the LND and the DFID 6MA data as it has not been possible to identify the socio-economic profile of the assessed students.

Rural ASER data paints a less optimistic picture of learning in the Punjab with some recent improvements

ASER data, mainly a rural data set which reports learning outcomes as scaled scores (a child is able to read nothing, a child is able to read a word etc.), shows poor levels of learning with some improvement in 2018-2019. Large proportions of school-age children are unable to achieve the most basic outcomes in literacy and numeracy. This data set also allows for a more nuanced analysis of learning outcomes by allowing disaggregation by socio-economic status. Wealth emerges as a clear marker of disadvantage and this is especially so for girls – poorest girls in rural Punjab remain the most marginalised in terms of their learning outcomes. There have been some improvements – the gap between poorest girls and poorest boys has diminished in 2018-2019. Furthermore, the gap between the poorest quintile and the richest quintile, while persistent, has narrowed over time. Limited data (MICS) shows that children in urban areas outperform their peers in rural areas, particularly in terms of literacy.

But a critical message is that even in a poor-quality education system, children learn more in school than out of it

The positive relationship between schooling and learning persists (WDR 2018). Getting children into schools improves their chances of learning and this is clearly the case in the Punjab, though learning

levels even for children who are in school remain low. Nevertheless, getting them into school and retaining them for the full cycle in a good quality environment becomes fundamentally important.

9.1.3 Are learners prepared for education?

Pre-primary enrolment in the Punjab has shown a marginal increase during the past few years, but majority of children 3-4 years are not participating in formal learning

The data reveal that pre-primary gross enrolment in the Punjab has increased from 79.4% in 2011 to 115.6% in 2017 according to MICS (rural data from ASER shows no improvement). Growth in net enrolment has been slower, implying that an increase in children attending pre-primary classes has not necessarily been at the age-appropriate level. Richer pupils and those in urban areas are more likely to access pre-primary schooling, with gaps by location declining over time. The share of private schools in pre-primary enrolment has increased such that the more than half of pre-primary GER is attributed to the private sector in 2016. Pupils in the Punjab also appear to be attending schools fairly regularly.

Early childhood development lags in literacy and numeracy in Punjab

In terms of early childhood development, children 3-4 years lag significantly behind in basic literacy-numeracy tasks with only 27.2% having basic familiarity with the alphabet, simple words and numbers in 2017. While children in early childhood programmes are more likely to be developmentally on track for the literacy-numeracy domain, overall learning is low. Moreover, children entering Punjab's schools (especially from poorer households) are not appropriately nourished and stimulated even though the nutrition and health of children under 5 has improved between 2011 and 2017.

There is limited support for learning in the household with gaps by wealth and location

Limited evidence shows low learning support for both children under 5 in terms of availability of materials (books) and early stimulation activities with adult household members. Similarly, children 7-14 years lack a conducive learning environment at home as well as parental support for learning at school. Wealth and regional disparity is evident with children from richer households and urban areas better prepared for schooling.

9.1.4 Has the effectiveness of teaching improved?

Teacher attendance in (rural) Punjab has consistently averaged more than 85% during 2012-2019

For learning to take place, the most critical factor is the presence of a teacher in the school. However, teacher presence in school forms only one aspect of 'teacher effort' and is likely to be influenced by numerous factors (such as distance to school, number of dependents in the household, official non-teaching duties the teacher might need to do, health etc.).

There are more qualified teachers in the Punjab over time

The data also reveal a sharp upward trend in government teachers with at least a graduate qualification in the Punjab during the 2012-2019. EMIS data reveal similar trends and also show that

on average, a government school teacher in the province has about 8-9 years' experience in the sampled school and around 14-18 years' experience in the School Education Department. Average experience has decreased in 2018, indicating new teacher recruitments.

But limited data suggests that teachers are not sufficiently prepared to teach challenging classrooms

TEACh data from three districts has revealed that teachers in the Punjab are not always well prepared to address the challenges they face in their classrooms. A large percentage of sampled teachers have reported that their pre-service training did not provide them with any training for multi-lingual settings (47%), diverse classrooms (47%), working with poor children (44%) or children with special needs (58%).

Limited data also shows that teacher are not fully competent in the curriculum, unable to transfer their knowledge to students and do not show good teaching practices

Limited data shows that not only are teachers not fully competent themselves in teaching the curriculum they are meant to be teaching to Grade 3-5 pupils, but often they are also not fully able to transfer their knowledge to their students. SABER SD assessments find that a little more than half of primary school teachers have basic mastery of the curriculum, with public school teachers performing best. Classroom observations show that while teachers are able to create a positive classroom culture, they rarely follow instructional techniques or provide socio-emotional support in the classroom.

9.1.5 Has the provision of learner-focused inputs in schools improved?

There have been some improvements in the provision of physical infrastructure in Punjab's schools

The evidence indicates some improvements in physical infrastructure inputs in rural Punjab (ASER data) over 2012-2019 (particularly for playgrounds, computer labs, and laboratories). The more comprehensive school census/EMIS data from urban and rural Punjab also reports improvements in school facilities. More schools have electricity and there are more useable toilets for students (average of 67 pupils to one useable toilet in 2012 as compared to 45 pupils to one toilet in 2019). The condition of government school buildings have also shown improvement in this period. The number of pupils per classroom has fluctuated, showing a slight increase from an average of 41 children per classroom in 2012 as compared to 44 children per classroom in 2019.

9.1.6 Has the management and governance of schools improved?

Insufficient information is available to draw any clear conclusions about the effectiveness of school management and governance and how this has changed over the period of PESP2.

There is some very limited evidence that assessments are being used to track students and rank schools in an effort to create mechanisms for data driven planning and create incentives for schools to focus on learning. There is a long way to go both in terms of effective planning based on learner needs at the school level, and empowering and capacitating school heads and teachers to use learning data to focus on children struggling with learning. The methodology underlying testing processes is discussed in the section on learning.

Introduction of the non-salary budget reform improves the efficiency of school financing mechanisms by getting funds directly to schools and thereby bypassing bureaucratic hurdles. However, underspending remains a concern at the school level. This issue is linked with questions around the management capacity and support at the school level.

Teacher attendance has improved in government schools but there is little readily usable information available on teacher effort and time on task in class. DSD/QAED has mechanisms in place to collect this information and there is some anecdotal evidence that this information is being fed into teacher training content and mechanisms. Data from these mechanisms is not available for engagement by researchers and evaluators, it is not being systematically tracked, and it is not fully integrated into the thinking about improvements in operational management and governance at the school level.

Limited evidence suggests that primary head teachers are not prepared for their role (through pre-service or in-service training), and lack realistic knowledge of teacher and student performance in their school.

9.2 Quality of evidence

9.2.1 Access Indicators

The access indicators – participation rates and GER/NER – are snapshots at a point in time, can have differing values depending on how they are calculated and need to be interpreted with caution. For example, a GER can exceed 100% due to the inclusion of over-aged and under-aged students either because of early or late entrants or due to grade repetition. A more rigorous evaluation needs additional information to assess the extent of repetition and late entry into schooling[48]. Participation rates are very simple measures of self-reported attendance in school and do not account for the level of education or any given school age band. A simple measure calculates the percentage who report participating in school, regardless of grade and this measure could be calculated for any age group and not for the official school-age population corresponding to the same level of education (e.g. for GERs). Therefore, there could be vast differences in access when measured using participation rates as these simplistic measures do not account for education level nor do they correspond to the school-age population corresponding to it. There are also differences in the underlying measures of socio-economic status (e.g. some data sets do not collect suitable measures whilst others are too simplistic). Therefore, further investigation is needed to understand whether these differences are being driven by drop-out or grade repetition. It is also important to understand who the children are who are participating more in schooling; it could be that the greater participation reflects entry by the more marginalised children but once they are in school, it becomes even more important to ensure they receive quality learning to attain skills required for smooth progression through schooling rather than drop-out.

9.2.2 Learning Outcome Indicators

The data sets used for the analysis in this report are problematic for various reasons. The LND data reports school-level averages and the DFID 6MA data has student-level averages. The percentage correct responses reveal reasonably high percentages and there are marginal improvements over

[48] http://uis.unesco.org/en/glossary-term/gross-enrolment-ratio

time. It is worth noting that school-level outcomes are likely to mask both progress as well as disparity in that improving averages could be driven by a few students (especially if they are deliberately selected to be assessed) in which case they are not illustrative of any real improvements in learning outcomes. However, even small improvements in outcomes that truly represent the entire age group are likely to be more illustrative of system-wide improvements. With these types of data it is even more important to identify *who the students are who are being assessed*; if learning outcomes have improved even marginally but the pupils who are being assessed are from particularly disadvantaged backgrounds, even marginal improvements reflect equitable system wide changes (in that not only are these children accessing schools but also showing improvements, even if they are marginal, in learning). The fact that it is not possible to disaggregate the LND and DFID 6MA analysis by socio-economic status is an important limitation of these data sets. ASER data report outcomes in a different way which does not allow comparison across these data sets and ASER data are far more limited in how learning outcomes are measured.

9.2.3 Learner Preparedness

There is limited good data to measure 'learner preparedness' in the Punjab, encompassing all aspects of the term. Data sets provide crude measures in the form of enrolments at the pre-primary level. Household versus administrative estimates are not comparable due slightly different age brackets used. Our focus on 3-4 years to identify early learners may be a very inaccurate assessment of the true age of participants at the pre-primary level. These measured indicators are very poor proxies of this key variable of interest which requires more nuanced understanding of whether children entering Punjab's schools are entering well nourished, whether they are appropriately stimulated, whether they enter into suitable and good quality early years learning environments, whether they are motivated etc. For this we rely on MICS reported data which provide robust estimates that are representative for Punjab on early child development and learning environment at home. While this does not provide a comprehensive review of changes over the evaluation period, such indicators simply do not exist in the data sets identified in our DQAs. Disaggregations by wealth and location are particularly useful in identifying gaps in foundational literacy and numeracy skills, learning environment at home as well as the parental involvement in the learning process. While preparedness is difficult to measure, comprehensive indicators in the latest round of MICS are improving data quality.

9.2.4 Effectiveness of teaching

Large-scale data sets in Pakistan do not capture fundamental aspects of effectiveness of teaching**.** The ASER and EMIS data sets are able to provide information on measures that are not always fully able to capture teacher effectiveness. Teacher attendance rates and qualifications only provide very crude proxies of teacher characteristics that might equate to 'effectiveness'. Arguably, teacher attendance is a proxy of effectiveness in that it proxies for teacher 'effort' through presence in school. The way data is collected on this particular measure, as with pupil attendance, is also superior to asking teachers or headteachers to report on attendance. However, as with the pupil attendance measure, it only captures a 'snapshot' measure of teacher attendance on any given day and may not capture more systemic absence for teachers which may arise due to them being absent due to election duties or such activities or even during harvesting season. Teacher qualifications also provide a very crude measure of effectiveness in that research has consistently shown qualifications to not matter for pupil learning (Aslam and Kingdon 2011, Aslam, Rawal and Jamil, 2013 using data from the Punjab show this to be the case).

More useful measures of 'effectiveness' would capture teacher competency, the teaching process within a classroom and teachers time on task to actual activities within a classroom and be able to link it to pupil learning gains effectively. With teachers forming the most critical input into a child's learning experience, school quality is directly associated with 'teacher preparedness' In this regard, TEACh, SABER SD and PEC PASL data are far more suitable by being more comprehensive and nuanced. Additionally, to fully capture teacher effectiveness and its impact on student learning, it is important to be able to link a given teacher who teaches a student to her student. ASER and EMIS data are unable to do this. TEACh data, on the other hand, is able to achieve this but its greatest limitation lies in being non-representative of the Punjab as it only captures information from three districts and is on a small sample of teachers. The PEC PASL data also links student and teacher in the classroom on learning. Furthermore, the SABER SD exercise conducts classroom observations, providing data on teaching practice and methods in the classroom. Statistics are representative for Punjab and provide a comparison between teachers (in public, private or PEF schools). These data sets are though only available for one year and data on the process of teaching and teachers' time on task both in the classroom and outside it is critically missing from all of the large-scale data sets.

9.2.5 Learner-focused inputs

There is no data on some fundamental learner-focused inputs such as materials. The main strength of the data analysed in this sub-section lies in the scope and coverage – both ASER data and in particular the ASC/EMIS data cover very large (or all government) schools in the Punjab and allow reporting on the inputs specified above. There are, however, some crucial weaknesses of the data, including the limited types of inputs on which the data sets are able to present information. In particular, none of the data sets collect information on availability of learning materials or textbooks per pupil. The indicators also do not provide detailed information on the extent to which inputs are available. For example, ASER data only ask 'yes/no' responses on whether a boundary wall is available, whether a useable toilet is available etc. without confirming the quality of these inputs. The EMIS data attempts to collect more detailed information.

9.2.6 School management and governance

Large scale data sets in Pakistan do not capture good quality information on key aspects of school management and governance. Quality of management at the school level incorporates aspects of operational practices, monitoring processes and outcomes, and people management. Data collection systems of the government departments and independent surveys do not collect any information at the school level on these aspects. The ASC/EMIS data collects information on some aspects, including development expenditures and frequency of school council meetings. However, the quality of the data is questionable. Preliminary findings from SABER SD shed light on principal knowledge of school problems but this data is only available for 2018. Furthermore, available indicators are very crude proxies for judging effectiveness of governance and management. The SIF dashboard recently rolled out in Punjab will improve real-time data flows from the school to the province level and provide improved information to guide management throughout the government school system.

9.3 Implications and issues

9.3.1 Overview of key findings and limitations

In summary, the performance of the education system in Punjab during the PESP2 period presents a mixed picture. There have been some gains (more children in school, improved physical infrastructure in schools) but there are numerous challenges (children in school not always in appropriate grades for their age; learning outcomes are low for many; access and outcomes are inequitable). However, the availability of high quality data is insufficient to answer many key questions.

Collecting information that allows better indicators of key variables would allow for more nuanced analysis using existing data sets in the Punjab. In looking at educational access and participation, it is important to know more about the children who are entering schools. This requires more detailed background information on children and households to be collected (for instance in sample surveys). We do not know enough about retention and repetition from the data sets analysed to truly capture the extent to which children who enter school go through a full cycle of education.

Aligning learning outcomes methodologies could improve existing data sets. Learning outcomes data are also reported and documented in ways that are not always meaningful though, the learning outcomes data collection efforts in Pakistan are also a step in the right direction. It is clear that there are efforts to align and discuss the findings from these various assessments. The TAMO report on Six Monthly Assessments (7 December 2016) has compared these assessments with the ASER assessments by SLO. The report has shown that for questions assessing SLOs where the same methodology has been used[49] by the two different assessments (ASER and Six Monthly) over 2012-2016, there is a clear alignment of results. However, where the same SLOs are tested but use different methodologies, there is a variation in findings. These findings hint at the need for different assessments across the Punjab to align their activities to at least apply similar methodologies to create checks and balances across different assessments and improve the credibility of findings.

The proxies used in this analysis should not be used to derive strong policy conclusions. For much of our analysis, we have had to rely on proxies that are not closely related to the underlying variables of interest. This is because data sets do not fully capture those elements that can help us fully answer the questions that are important for us. One example is provided by ‘teacher effectiveness’ where we have had to rely on very weak proxies as the data simply do not exist.

For example, using teacher attendance as a proxy for teacher motivation and teacher effectiveness. Whilst this measure is used consistently, teacher attendance may be influenced by numerous factors including poor motivation - for example transport issues, health, looking after dependents etc. A better measure of teacher effectiveness would be something that captures the true ‘effort’ a teacher puts into teaching whilst in school (both when teaching and also when preparing for lessons). Thus, high or low teacher attendance rates do not truly measure ‘effectiveness’ or motivation. Limited data (TEACh, SABER SD and PEC PASL) provide more nuanced information for one time period which does not allow us to detect changes over time. Policy makers should take care to focus on the factors

[49] Specifically comprehension in English and two digit subtraction with borrowing in Maths.

that are important for delivering improved learning and not just on the factors that are measured or measurable.

Similarly, due to a lack of data, our initial analysis of learner preparedness had been proxied by student enrolment at the pre-primary level and attendance rates. These are perfectly valid proxies that are used repeatedly in the literature. However, it is important to note that reporting that enrolment rates at the pre-primary level are low then does not imply that simply achieving higher enrolment rates (or pupil attendance rates) will improve learner preparedness. Using data from MICS, allowed better indicators for prepared learners such as physical, learning and social development, along with stimulation and support at home. This information is though only available for a limited time period and does not allow for assessing changes in preparedness over time. More information is needed on the diverse range of early childhood programmes. We also need to know more about how these aspects are nurtured in a pre-primary school and to what extent, it is not possible to say that increased enrolments at the pre-primary level will result in more 'prepared learners'.

Improving the documentation and reporting underlying data and making it more easily accessible would improve the credibility and use of the data sets. It is clear that significant efforts are being made to collect a large amount of potentially meaningful data but the validity and credibility of this data is undermined by inadequate documentation. Simply improving the transparency and documentation of data is likely to improve reporting by third parties. As noted above, there have been important recent developments in collecting data on teacher effectiveness and school performance (through the SIF) but the results of these initiatives are yet to be realised.

9.3.2 Issues for improving information on the education sector

There are several large-scale data sets collecting information on various aspects of education within the Punjab (and other areas of Pakistan). These data sets provide very useful and timely information on the overall functioning of the education system. However, they are not always suitable for answering some fundamental questions about the performance of the education sector.

In some instances, it is possible to supplement existing data collection initiatives in meaningful ways to provide a more nuanced data set that not only answers the questions raised in this evaluation but also allows us to present more than a descriptive picture of where Punjab stands at a given point in time. In doing so, it may be possible to use the existing data set to establish links between some critical inputs with student learning (and even changes in learning over time).

This would require collecting additional variables – pupil characteristics, family background and school and teacher level variables within the data sets; data on learning outcomes to be collected from a random sample of pupils at baseline who are then 'followed' over time (to provide a longitudinal data set). It may be possible to improve the quality of some of the existing initiatives in order to overcome some of these limitations. For example, the LND data set collects information on learning outcomes. Supplementing the learning outcomes information with pupil and parental questionnaires to allow family background information to be collected and linked to each child would be a useful approach. Ensuring that the learning outcomes data are collected on a random sample of children and following the same children over time would also provide far richer information with a more longitudinal sample. Introducing child registration information in the recent ASC/EMIS exercise will be useful to identify the same children over time. This can also be used to gather further information on pupil characteristics, such as disability. While the latest (2020) ASC/EMIS survey

contains a 'yes or no' question on whether a child has mild disability, this information is insufficient to guide detailed decision-making on disability and special educational needs, for instance in line with approach advocated by the Washington Group on Disability Statistics.

The first round of RESP identified the possibility of enhancing the quality of the existing LND data by introducing the use of classroom observations to collect relevant information on teacher effectiveness, increasingly being advocated in policy and research. While the LND data still does not collect any information on teacher quality, the introduction of the SIF dashboard will present data on LND and classroom observations of primary teachers at the school level, providing information for both teacher 'effectiveness' indicators and learning outcomes together. Going forward, linking data on those teachers who teach the pupils being assessed can be a useful addition to assess programme effectiveness.

It is also worth noting that most of the proxies for 'learner focused inputs' within the analysis are based on physical infrastructure rather than on indicators such as availability of teaching and learning materials. Even the data on physical infrastructure needs to be more nuanced (i.e. do school toilets have soap?). Data are needed on textbook availability and provision as well as on the reallocation of resources at the school level to focus greater attention on learning focused inputs. It is also important to have data that allows researchers to establish a link between variables (such as availability of learner-focused inputs, both infrastructure and teaching and learning materials, and learning outcomes) and this requires a single data set that collects information on all these variables to allow estimation of education production function linking schooling inputs (individual, parental background, teacher and school level variables) to student learning outcomes. The SIF dashboard provides the platforms within which these additional variables can be suitably collected by using well-designed instruments.

Given the policy focus on early childhood education, it is also useful to consider ways in which accurate and timely data can be captured on 'prepared learners'. While some recent data is available on whether children entering Punjab's schools are physically ready and appropriately stimulated, more information is need on whether children enter into suitable and good quality early years learning environments. Initiatives such as the Early Learning Partnership (ELP), a multi-donor trust fund managed by the Work Bank, promote increased investment in children's early years' opportunities and outcomes. In some countries this has involved using the MODEL and MELE tools within the Measuring Early Learning Quality and Outcomes (MELQO) initiative designed to generate data on children's learning and development at the start of school and within pre-primary learning environments. Using such tools, adapted to the local context, provides one opportunity for assessing the preparedness of learners within an education system[50]. It is worth exploring the extent to which these types of tools can be used in sample surveys to capture children's learning and development in pre-primary and early primary settings in the Punjab.

This report has also highlighted gaps in school management and governance indicators. As Punjab moves toward further devolution, data on school leadership will be essential to identifying capacity challenges at the local level. The SIF framework is a step in the right direction with regards to pooling existing data from app-based tools to inform decision making at the school, sub-district, district and provincial levels, enabling stakeholders to take evidence based action. Going forward, input of timely

[50] http://www.worldbank.org/en/topic/education/brief/early-learning-partnership

and accurate data into the SIF dashboard will be crucial to sector progress. As the SIF is rolled out across the province in 2021, its effectiveness remains to be seen.

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Annex A Summary of Revisions to the RESP

This report was first prepared in 2018 to contribute to the First Interim Evaluation Report for the PESP2 evaluation. As more information become available over the evaluation and of PESP2 implementation, this report was updated for the Second Interim Evaluation Report in 2019 and, now, the Final Evaluation Report in 2020. This annex explains the main differences with the first round of the RESP report in terms of data (additional rounds and new data sources), changes in interpretation and changes in conclusions.

A.1 RESP update for Second Interim Evaluation (2019)

As part of the second phase of the Evaluation (contributing to the Second Interim Evaluation Report) additional rounds of data that became available since the RESP was undertaken were reviewed. This included:

- The **Nielsen household data** set, which covered eight waves of 36,000 households, on average, between November 2011 and December 2015 (using the same questionnaire) was included in the RESP. The update included an analysis of the final round – Wave 9 – of this data set (January to December 2017) with a slightly different questionnaire (i.e. household assets instead of household income).

- The **Learning and Numeracy Drive (LND) data**: This is a school-based data set based on monthly testing. A number of different tests and questionnaires have been used for this and the data reviewed in the RESP covered the period 2015-2017. The update covered the period up to January/February 2019.

- **Annual Status of Education Report (ASER)** produced annual waves of data (with the exception of 2017) which were covered in the RESP (2012-2016). This data set collects information both from households and schools. Children are assessed on basic literacy and numeracy and household level information collected (assets, maternal education, education levels completed) and school level information gathered (teacher qualifications, enrolments etc.). This update included ASER data from 2018.

  However, a change in sampling methodology for the ASER in 2018 was thought to render comparisons of data from 2012-2016 and those in 2018 invalid. According to the ASER (2018) sampling methodology, the villages for the 2018 survey were selected using the Provisional Village Directory of the 2017 census. In previous data collection rounds, the villages were selected from the Village Directory of the 1998 census. The ASER report claimed that this shift could potentially explain the variation in the results for 2018 when compared to the results of previous years. As a result of the shift in sampling, 2018 data was used to provide an accurate snapshot but not to be compared with the results from 2012-2016.

The following administrative data sets were analysed:

- **Annual School Census (ASC)/ Education Management Information Systems (EMIS)** data for the period 2012-2016 was included in the RESP, which covers data on enrolment,

infrastructure and facilities, teachers, and school committees in government schools. The update has included EMIS data from 2017 and 2018.

- **Private Schools Census (PSC)** data from 2011 and 2016 was also analysed. This source was not included in the original RESP.

The additional information allowed for some assessment to be made of changes over one to two years for participation, learning outcomes, and some factors affecting the supply of the key ingredients of effective learning to classrooms. However, as noted in the RESP, there are significant gaps in the data available for making a comprehensive assessment, and the non-comparability of ASER 2018 data over time limited the extent to which trends in participation can be measured. Addition of new rounds and data add to the existing RESP through the following conclusions:

- **Education access and participation:** Based on ASER 2018, the participation rate for 5-16 year olds in Punjab is 88.8%. There is a lack of complete data on participation trends but GERs for government schools and private schools have increased over the time (according to administrative data).

- **Pupil learning outcomes:** LND learning outcomes continued a general trend of improvement to early 2019.

- **Effective teaching:** The level of experience of teachers in government schools fell by 2018, indicating new teacher recruitments, and the student-teacher ratio increased. Student-teacher ratios were much lower in private schools than public schools in 2016.

- **Learning focused inputs**: By 2018 there was near to 100% availability of infrastructure and facilities in government schools. Availability was slightly higher in private schools than government in 2016, and the number of teachers per classroom much lower in the private sector.

- **Skilled management and governance:** The average number of school council meetings and of school council members in government schools rose in 2018.

This suggests a generally improving trend during 2018 in relation to key indicators though the reduction in the average experience of teachers and increase in student teacher ratio in government schools may affect the quality of teaching, depending in particular on how skilled the large number of newly recruited teachers are.

The quality of data available for assessing trends has tended to weaken rather than improve. The updated sampling approach for ASER 2018 meant that the point estimates for 2018 should be of improved quality, and allow better comparison going forward, but it is not possible directly to assess trends from earlier years. This initiated an ASER data comparability study to increase the comparison of ASER estimates over time. Data on learning is no longer available from the DFID 6MA, so the only time series data available is from LND.

A.2 RESP Update for Draft Final Report (2020)

As part of this phase of the Evaluation additional rounds of data that had become available since the 2019 RESP revision were reviewed. These included:

- **Annual Status of Education Report (ASER)** produced annual waves of data (with the exception of 2017) which were covered in the RESP (2012-2018). The update included ASER data from 2019. During this update the ASER data comparability exercise found that an over-time analysis of ASER estimates is valid and informative. Instead, the analysis identified issues in the sampling strategy (survey rotating panel) and data management that increase sampling errors over time (inhibiting precision or statistical significance of estimates over time).

- **Pakistan Social and Living Standards Measurement (PSLM) Survey**, is an extensive household-level survey with very detailed information collected on household incomes, expenditures, education levels of various household members etc. The first draft of RESP contained data from three rounds (2013/2014, 2014/2015, 2015/2016). This update added two additional rounds (2012/2013, 2018/2019), expanding the PSLM analysis over a longer time period, aligning with the beginning of PESP2.

In addition to analysing raw data from these, we also where possible used data from other published and unpublished research (without a formal assessment having been made of its quality). This includes:

- **Multiple Indicator Cluster Survey (MICS),** conducted every three years from 2011-2017 for Punjab. This is an extensive household-level survey led by UNICEF, and maps the situation of women and children around the world. The access indicators have been calculated from the raw data in line with the analysis of DQA I data sets, while the remaining indicators discussed in this report draw on reported statistics in publicly available reports. This data source was not included in the original RESP.

- **SABER Service Delivery (SD)** tool, developed by the World Bank, studies barriers to student learning outcomes in primary schools in Punjab. Data was collected for a convenience sample of six districts that is representative of North, Central and South Punjab. Data was collected on schools, children, teacher, principals and parents in 2018 to understand components of the WDR 2018. Preliminary findings from the initial data release are discussed here. This data source was not included in the original RESP.

- **Punjab Examination Commission's (PEC) Provincial Assessment of Student Learning (PASL)** 2018-2019 study links student learning with teacher competence and teaching practice, providing useful information for understanding teacher effectiveness. This data source was not included in the original RESP.

Additional data rounds from data sets included in the RESP have expanded the analysis for a longer time period. Introduction of new data sources provide a better understanding of key ingredients to effective learning, such as early preparedness. The update to the conclusions include:

- **Education access and participation:** Additional ASER and PSLM data, along with the introduction of MICS, continue to support the conclusion that while more children are participation in schools, they are not doing so at the age appropriate level.

- **Pupil learning outcomes**: Additional rounds of household learning data, ASER 2019, point towards small improvements in literacy and numeracy outcomes when compared with ASER

2018. The original round of RESP did not show improvement over time in ASER learning outcomes.

- **Prepared learners:** While previous rounds of RESP presented pre-primary GER/NER and student attendance to discuss preparedness, the inclusion of the MICS and SABER SDI data has allowed for a more nuanced understanding of this component, although for a short period of time. Pre-primary enrolment has increased over time, but children might not be attending these classes at the age-appropriate level. Child nutrition and health shows improvement over time, but concerns remain. Early child development in Punjab lags in literacy and numeracy outcomes for children 3-4 years. There is limited support for learning in the household and parental involvement at schools, with gaps my wealth and location.

- **Effective teaching:** Data from SABER SDI and PEC PASL support the previous discussions from TEACh that teacher are not always complement and unable to transfer their knowledge, through data representative for Punjab. While teacher behaviour and interaction in the classroom are important to the learning process, classroom observations show lack of good teaching practice.

- **Skilled management and governance:** Preliminary findings from SABER SDI show that principals lack knowledge of problems in their schools with regards to student and teacher performance.

With regards to the quality of ASER data, the comparability exercise identified issues in data management and implementation of sampling strategies. While the initial aim was to conduct a trend analysis or explore adjustment weights and increase the comparability of ASER estimates over time, these issues shifted the original focus of the study. The study concludes that ASER estimates are robust and representative of Punjab but statistical significance over time is negatively affected by these sampling errors. So, in contracts to the preliminary conclusion in the 2019 RESP update, it was concluded that a valid time series analysis from ASER can be presented (OPM, 2020a).

The quality of data has improved, through the inclusion of MICS and SABER SDI, by allowing better understanding of the conceptual framework through data representative for Punjab. Limited data rounds, however, only provide insights in the status of teacher effectiveness, for instance, at one point in time. More nuanced data needs to be collected over multiple rounds to enable comparisons over time.

A.3 RESP Supplementary update (2021)

As part of the last phase of the Evaluation (contributing to the Final Evaluation Report) additional rounds of data that have become available since the 2020 RESP revision was undertaken were reviewed. This included:

- **Annual School Census (ASC)/ Education Management Information Systems (EMIS)** data for the period 2012-2018 was included in the RESP. The update has included EMIS data from 2019 and 2020. While provisional data from 2020 has been made available to analyse, there are issues of comparability over time with this round. The data shared only includes schools under the SED, excluding public private partnership schools that are represented in previous EMIS rounds. Moreover, this round collected information on student's registration number (B-form) in an effort to reduce data duplication issues. While

the 2020 data cannot be compared to previous rounds, it has been presented in this analysis as it is the only data collected during the COVID-19 period. Furthermore, low student classroom ratios and low student teacher ratios in 2020 might be due to lower school enrolment for the 2020/2021 academic year.

- **Learning and Numeracy Drive (LND) data** from September 2015 to February 2019 was include in the RESP. The update covered the period up to February 2020. The LND assessment has not been carried out since the initial school closure in March 2020.

There has been no further data collection in the household surveys, namely PSLM, ASER and MICS since the last update.

The additional information allowed for some assessment to be made of continuation of trends in government schools over time, through the following conclusions:

- **Education access and participation:** Government share of primary and middle GERs are largely consistent between 2018 and 2019.

- **Pupil learning outcomes:** LND learning outcomes show slow improvement in the 2019/2020 academic year.

- **Effective teaching:** Student-teacher ratios have decreased in government schools in 2019 and 2020. One caveat in these findings is that the ratios from 2019 and 2020 exclude public private partnership schools that might arguably represent the most resource constrained public schools.

- **Learning focused inputs**: There was near to 100% availability of infrastructure and facilities in government schools in 2019 and 2020. Number of 'satisfactory' school buildings have further improved along with a decline in the student toilet ratio in 2019. The student classroom ratio has fluctuated over time, showing a slight increase when comparing 2012 with 2019.

- **Skilled management and governance:** No information on school council and the NSB was included in the EMIS 2019 and 2020 made available.

Annex B Summary of the Data Quality Assessment[51]

B.1 Methodology of the DQA

The focus of this analysis was on identifying the extent to which existing secondary data sources can provide robust and *good quality indicators of performance*. Therefore, the analysis undertaken here involves both a desk-review based DQA of secondary data sets as well as an identification of *potential indicators that could be generated* from within these data sets that are quality measures of PESP2 performance.

The following resources were reviewed and evaluated with respect to dimensions identified within the Frameworks:

- An assessment of the planning documents that relate to the data set.
- A review of the final data set.
- A review of any final reports/publications (online and hard copies).

Documentation was reviewed for information on concepts, definitions and classifications used, and to assess the quality of data collection and analysis. This included making an assessment about coverage, sampling (where relevant) and response errors, questionnaire design and training for field workers for data collection, as well as how the data are managed. Access to information and data and accessibility were also evaluated.

The final survey data sets for which the DQA was undertaken are the following[52]:

- The Punjab School Education Survey (PSES) (previously known as Nielsen) household dataset, covering eight waves of 37,000 households, between November 2011 and December 2015 (using the same questionnaire);
- The Learning and Numeracy Drive (LND) data: bi-monthly testing. A number of different tests and questionnaires have been used for this and it covers the period 2015-2017;
- DFID's six monthly learning assessment data, covering the period 2014-2017;
- Annual Status of Education Report's several waves of data (2012-16);
- Pakistan Social and Living Standards Measurement (PSLM) Survey, 2012-2016.

The administrative datasets for which DQA was undertaken were:

[51] This section is drawn from the Data Quality Assessment Report produced as part of the Evaluation Inception Phase.
[52] Dates refer to the period covered by the DQA exercise (which was undertaken in 2017 for the survey sources, and 2019 for administrative sources). No update of the DQA was undertaken to take account of any possible changes in data collection methodology. However a more detailed review of the ASER methodology focusing on the extent to which valid comparisons over time could be made from the data presented was undertaken.

- The Annual School Census/Education Management Information System (ASC/EMIS), covering the period 2012/13-2016/17.
- The Private School Census (PSC), covering data collected in 2011/12 and 2016/17.

The DQA examined available survey plans and design documents to assess the following dimensions for each of the data sets listed above:

1. Quality dimension 1: Integrity;
2. Quality dimension 2: Methodological soundness;
3. Quality dimension 3: Accuracy and reliability;
4. Quality dimension 4: Serviceability;
5. Quality dimension 5: Accessibility;
6. Quality dimension 6: Training and field work review.

B.2 Summary of DQA findings

This section presents the summary DQA findings for the survey datasets and administrative data, using the legends shown in **Error! Reference source not found.**.

Legends for DQA tables

Legend for Data Quality Analysis Dashboard	
	Strength of the survey/indicator
	Relative less strong part of the survey that has potential for revision
	Relative weakness of the survey that can be revised
	Critical weakness of the survey that compromises its ability to assess

B.2.1 DQA survey datasets

DQA summaries are presented below for: (i) The Nielsen Survey/PSES; (ii) LND survey on learning outcomes; (iii) DFID's six monthly learning assessment data; (iv) ASER; and (v) PSLM.

Annex Table 1 Dashboard Summary: Nielsen/PSES Household Surveys

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		1000 households per district for 36 districts with a non-response rate of 3.1% per district. The most knowledgeable household member/s are questioned in the survey to gather detailed information for children aged 4-16 years old. The survey features a household roster as well and includes questions on socio-economic background for all household members.
	Sampling Design		The design of the sample follows a multi-stage cluster based random sample.
	Non-Response Treatment		Information not made clear. The non-responded instrument is replaced by the following: *"the substitution of a selected respondent if required is made by another person in the same vicinity with profile that matches the original respondent."*
	Sampling Procedure		Stratified Multi-Stage Design which uses EB's (Enumeration Blocks) for Urban areas and Village/Mouza boundaries for rural areas.
Sampling representivity	National		Data neither representative nor available for the national level.
	Province		Data may not be representative at the provincial level.
	District		Data may not be representative at the district level.[53]
	Urban/rural		Data can be disaggregated by urban/rural
	Gender		Data can be disaggregated by gender
	Age		Data can be disaggregated by age.
	Socio-economic Status		Data can de disaggregated by some measure of SES. The socio-economic section features an income and employment status category for the chief wage earners and everyone else in the house.
	Disability		Data can be disaggregated by disability for wave 7 and wave 8 which features questions for disability for children in special schools (public and private). This sections ranges questions on the nature and kind of disability for the child in special school.
Questionnaire	Pilot testing		No information available.
	Methodology		No information available.
	Length		4 modules for Household Roster, Education, Health, and socioeconomic background with 104 questions in the entire survey. Fatigue for the respondent might not be an issue.
	Translation		No information available.
	Enumeration process		No information available.
Field work and Data management	Quality control		No information available.
	Data processing		No information available.
	Data editing		No documentation on the treatment of missing data, variable ranges, editing or imputation of data.
Which indicators does this database	Literacy Rate		No information Available

[53] The background document says that sample is representative at the district level. However, interviews with key personnel show otherwise. This is explained in more detail below in assessment of source data.

DQA indicator	Description	Dashboard value	Notes
have information on?			
	Enrollment/attendance Rates (Gross and Net)		The survey collects data on whether a child is currently enrolled in school or not, the type of school attended and the current class in which the child is enrolled. Along-with child age, this information should allow the calculation of which allows us to calculate gross and net attendance rates.
	Participation Rates		The education module provides information about children from age 4-16 years about being enrolled in a general school or madrasah. This information can used to see how many children are in school or not and if so, the type of school attended.
	Student Learning Outcomes		No information Available
	Transition Rates		No information Available
	Completion Rates		The education module provides information about children from age 4-16 about being enrolled in a school or madrassah and also dissects it by the class in which the child is enrolled in which allows us to calculate completion rates.
	Dropout Rates		The education module provides information about children from age 4-16 dropping out of school and whether they chose to go to another school or continue education elsewhere. This allows us to calculate dropout rates and also provide estimates of reasons for drop-out.
	Teachers Number and Quality		Some perception-based information about the quality of teachers and the satisfaction of the household with their schools is available.
	School Environment		The survey also features some information about household satisfaction with the school administration and programs developed in the school nested as responses to questions for ‘reasons for never attending school’ or dropping out.
	Finance		No information Available
	Accountability Relationships		No information Available

Annex Table 2 Dashboard Summary of the Literacy and Numeracy (LND) Assessment data

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		There are around 43,000/49,000 schools in Punjab that have K-5 students which seem to be the target population - it is unclear how the sample schools are selected or if all the schools are visited since the website mentions all grades.
	Non-Response Treatment		The Data presents itself to be a census data so no-response becomes irrelevant. However, the raw data has incomplete observations suggesting that the whole tool was not administered.
	Sampling Procedure		Students are chosen on a random basis according to their website, the sampling documents do not make this clear and the exact technique is not specified.
	National		Data neither representative nor available for the national level.
Sampling representivity	Province		Documentation reports the data set to be representative at the provincial level.
	District		Documentation reports the data set to be representative at the district level.
	School		Data is not representative at the school level, only 6 pupils tested/school.
	Urban/rural		Data can be disaggregated by urban/rural through the EMIS Annual Census Data.
	Gender		Whilst it may be possible to disaggregate the data by school-gender through the EMIS Annual Census Data, there is no individual-level/child level information available for this level of disaggregation.
	Age		Data cannot be disaggregated by age.
	Socio-economic Status		Data cannot be disaggregated by a measure of SES.
	Disability		Data cannot be disaggregated by disability for wave 7 and wave 8.
Questionnaire	Pilot testing		LND went through a testing/pilot phase between March to September 2015. Tablets which are used to record the assessment, minimizing data compilation errors were pilot tested between March and September 2015. Further information/data from this phase is not available.
	Methodology		The questionnaire itself is provided in an android application. It unclear from both the documentation and the raw data the number of total questions administered per student and per school. Similarly there is no sampling methodology for selecting each student in a class; it is unclear if that has been consistent across time. The number of students tested in each class remains the same irrespective of class size.
	Length		5-10 questions available on an android application which change with each attempt, fatigue for the respondent might not be an issue.
	Translation		No information available.
	Enumeration process		Electronic enumeration through tablets so data is real time updated.
	Quality control		MEA's collect this data with monthly monitoring so issues of cheating etc. are not addressed. Electronic

Field work and Data management			enumeration through tablets so data is real time updated.
	Data processing		Electronic enumeration through tablets so data is real time updated.
	Data editing		No documentation on the treatment of missing data, variable ranges, editing or imputation of data.
Which indicators does this database have information on?	Literacy Rate		No information Available
	Enrollment Rates (Gross and Net)		No information Available
	Participation Rates		No information Available
	Student Learning Outcomes		The data reveals results of a test to third graders for English, Math and Urdu. The data for these tests is comparable over the months. A limited number of SLOs are tested. However, as the SLOs being tested are drawn from the six monthly assessment dataset, the LND data is comparable to that dataset. Taking into account issues with the sampling methodology would suggest that performance cannot be compared across schools.
	Student Attendance		No information Available
	Retention Rates		No information Available
	Transition Rates		No information Available
	Completion Rates		No information Available
	Dropout Rates		No information Available
	Teachers Number and Quality		No information Available
	School Environment		No information Available
	Finance		No information Available
	Accountability Relationships		No information Available

Annex Table 3 Dashboard Summary of DFID Six Monthly Assessment (6MA) data

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		The survey is implemented in 115 girls' schools, 107 boys' schools, 109 non-primary and 113 primary schools. These schools are situated with 5800 students located in 36 districts. The overall margin for error in the sample size is 1.2%. Separately the test is delivered to PEF, CARE and other private schools as well to compare the performance and a total of 4150 students with a margin of error of 1.2% are tested. The total sample amounts to 9950 students in the sample with an error of 1.2%
	Non-Response Treatment		The data specifies the sample size to be lower in some cases when some selected students in each class are absent. However, no information is present on non-response. In fact, the available information suggests that there is no treatment of non-response.
	Sampling Procedure		Students are chosen on a random basis according to the PISA sampling strategy weighted according to geographical area, gender and school level.
	National		Data neither representative nor available for the national level.
Sampling representivity	Province		Data claims to be representative at the provincial level.
	District		Data claims to be representative at the district level.
	School		Data claims representative at the school level for only Grade 3.
	Urban/rural		Data can be disaggregated by urban/rural through the EMIS Annual Census Data.
	Gender		Data can be disaggregated by gender.
	Age		Data cannot be disaggregated by age.
	Socio-economic Status		Data cannot be disaggregated by a measure of SES.
	Disability		Data cannot be disaggregated by disability for wave 7 and wave 8.
Questionnaire	Pilot testing		The survey instruments and methodology went through field tests which were used in the design of the paper in order to ensure that it would be understood by as many students as possible.

	Methodology		The sampling strategy is different for government and PEF schools but uses the PISA sampling methodology: 1. Government Schools: Schools are allocated across 9 divisions in Punjab which proceeds with an explicit stratification across all schools. Following this, the schools are allocated based on the gender of the schools and type of the school. In the third stage schools are filtered based on a probability proportional to size method selection. 2. PEF Schools: The schools are allocated proportionally across EVS, NSP and FAS programs. Following this schools are allocated across districts. In the third stage schools are filtered based on a probability proportional to size method selection.
	Length		The test has 8 questions for Maths, 6 for English, and 7 for Urdu with the total length of the test not being long and not causing fatigue.
	Translation		Word problems for Math are also available in the local language.
	Enumeration process		No information on the electronic enumeration process is available.
Field work and Data management	Quality control		This data is collected by various checks and processes set in place to ensure the validity of the dataset. The test papers were delivered to the invigilators a day or two before the tests and the invigilators are external parties which has introduced some transparency into the process. Post the test; the exams were sealed to ensure their validity.
	Data processing		There is no information available to assess data processing.
	Data editing		No documentation on the treatment of missing data, variable ranges, editing or imputation of data.
Which indicators does this database have information on?	Literacy Rate		No information Available
	Enrolment Rates (Gross and Net)		No information Available
	Participation Rates		No information Available
	Student Learning Outcomes		The data reveals results of a test to third graders for English, Maths and Urdu. The data for these tests are comparable over the bi-annual time periods. These SLO's combine the score for equally weighted questions to give us a combined score of the percentage scored by the student. Child-level information is available on learning outcomes.
	Student Attendance		No information Available
	Retention Rates		No information Available

	Transition Rates		No information Available
	Completion Rates		No information Available
	Dropout Rates		No information Available
	Teachers Number and Quality		No information Available
	School Environment		No information Available
	Finance		No information Available
	Accountability Relationships		No information Available

Annex Table 4 Dashboard Summary of Annual Status of Education Report data

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		All districts of Pakistan. 30 villages per district and 20 households per village in rural areas. For urban areas, number of blocks selected per district ensure significance.
	Non-Response Treatment		Systematic sampling is used to select households till the required sample is achieved. No response recorded in survey, but not available in raw data.
	Sampling Procedure		Stratified two stage design. Primary sampling units selected through probability proportional to size technique. Secondary sampling units selected through systematic sampling.
	National		Data representative at the national level.
Sampling representivity	Province		Data representative at the provincial level.
	District		Data representative at the district level.
	School		Data is not representative at the school level.
	Urban/rural		Data can be disaggregated by urban/rural for districts where both areas were sampled.
	Gender		Household data can be disaggregated by gender.
	Age		Household data can be disaggregated by age.
	Socio-economic Status		Household data can be disaggregated by socio-economic status measured by house-type and presence of assets.
	Disability		Household data can be disaggregated by child disability from 2015 onwards.
Questionnaire	Pilot testing		ASER was piloted in 2008. Assessment tools were piloted in 2011. Additionally, there is an intensive tool review and testing process each year.
	Methodology		Village information sheet, school observation sheet and household survey. Assessment tools administered as part of the household survey consist of simple tests of language (Urdu/Sindhi/Pashto), English and Arithmetic.
	Length		2 modules in the household. Each child aged 5-16 years must be tested which might give rise to respondent or enumerator fatigue.
	Translation		Enumerators are local volunteers, so data collection is conducted in the local language. It is unclear if tools are translated.
	Enumeration process		Data quality conducted in the field. Whilst enumerators have been trained, it should be noted that they are volunteers rather than paid career enumerators.
Field work and Data management	Quality control		Head office team monitors district coordinators. District coordinators monitor village enumerators. Enumerators have detailed field instruction booklets.
	Data processing		Data cleaning at district, then head office level. Data entry at head office through software.
	Data editing		No documentation on the treatment of missing data, editing or imputation of data. Variable ranges are available in coding manual.

Which indicators does this database have information on?	Literacy Rate		Mothers and father's education levels recorded to allow for some literacy measures
	Enrollment Rates (Gross and Net)		Household data has information on educational status of children aged 3-16 years. Information on student age and class also available.
	Participation Rates		Household data has information on educational status of children aged 3-16 years.
	Student Learning Outcomes		Assessment of Language (Urdu/Sindhi/Pashto), English and Arithmetic administered to children aged 5-16 years.
	Student Attendance in school		School data has information on students physically present on the day of the survey.
	Retention Rates		No information available
	Transition Rates		No information available
	Completion Rates		The instruments collect information about children from age 3-16 about being enrolled, the type of school they are enrolled in as well as the current class/grade in which the child is enrolled which allows us to calculate completion rates.
	Dropout Rates		Household data has information on educational status of children aged 3-16 years.
	Teachers Quality		School data has information on teacher attendance and qualifications.
	School Environment		School data has information on access to infrastructure and facilities.
	Finance		School data has information on funding.
	Accountability Relationships		No information available

A study of the comparability of ASER estimates over time was carried out as part of the PESP2 evaluation. The study concluded that ASER estimates are robust and representative of Punjab but that the statistical significance of changes over time is reduced by some features of the sampling approach. A summary of the findings is presented in Box 3.

Box 3 ASER Data Comparability Study – Key Findings[54]

The Annual Status of Education Report (ASER) Data Comparability Study investigated ASER's sampling approach and data. The original objective of this study was to address the challenge of over-time comparability across ASER survey data due to the change in the ASER sampling frame from the 1998 to the 2017 Pakistan population census, starting from the 2018 ASER survey round. Issues related to the ASER sampling strategy and data management shifted the original scope of the study towards investigating the issues themselves and putting forward recommendations to address them.

Several ASER survey technical documents and data files were examined as part of this study. To determine the effects of the sampling frame change on the validity of ASER data time series, a trend analysis was designed to compare sub-samples derived from the two different frames. The analysis preparatory work identified issues with the survey rotating panel and data management approaches. Whilst the trend analysis and any resulting adjustment to improve comparability could not be completed due to these issues, the investigation of the sampling data continued and became the focus of the study.

Sampling Strategy

The documentation concerning the ASER survey sample selection indicates that the ASER sampling strategy is supposed to be based on a rotational panel. According to this approach, at each subsequent round of the ASER survey, 20 villages are retained (panelled) in the sample, whilst 10 villages are replaced (rotated), in each district. However, our study shows that the approach employed does not amount to a rotating panel. Whereas, 10 villages are dropped at random from each district at each round, without tracking when they were initially selected into the sample and whether, therefore, they should be retained or replaced.

Data Management

As part of the originally proposed trend analysis, a key step was the identification of which villages, included in the ASER 2018 and 2019 samples, were derived from the 1998 or the 2017 census frames. No specific variable in any of the ASER data files could be used to identify the frame used for the sample selection. Merging villages across different rounds and identify relevant subsets was the only solution to achieve this. The merging process exposed village mismatches in data files within and between ASER surveys as well as a different ratio than expected between villages panelled and rotated across rounds.

Recommendations

The recommendations from this exercise are aimed at improving the robustness of the ASER survey sampling and analysis, especially time series across survey rounds. Each individual ASER report provides unbiased estimates of the current situation and time series based on these estimates are generally valid. However, this study has identified issues with the ASER sampling strategy and data management that increase the sampling error in estimates over time, thus reducing the explanatory power of trend analyses across ASER survey rounds. This also entails that a valid time series analysis based on past ASER survey data could be presented in the Review of Education Sector Performance (RESP), but with appropriate caveats. In order to address the issues highlighted in this study and thus improve the precision of any future trend analysis based on ASER data time series, the study recommends that: 1) the panel rotation of the ASER village sample is implemented systematically; and 2) the sampling data structure and variable definition are built robustly and kept consistent across ASER survey rounds.

[54] OPM, 2020a.

Annex Table 5 Dashboard Summary of PSLMS

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		The survey is implemented in all provinces of Pakistan excluding FATA and some military restricted provinces. This leads to use of 594 Urban and 1860 rural PSU's, and 6814 Urban and 1860 rural PSU's for Punjab. The sample size that these enumeration blocks yields are a total of 36002 households in Punjab.
	Non-Response Treatment		The documents with the data specify non-response and the treatment of non-contact and refusal households as problematic since the non-contact and refusal households are excluded from covered PSU's and SSU's.
	Sampling Procedure		Households are chosen on stratified two stage sampling procedure.
	National		Data representative at the national level.
Sampling representivity	Province		Data claims to be representative at the provincial level.
	District		Data claims to be representative at the district level.
	School		Data is neither collected nor representative at the school level.
	Urban/rural		Data can be disaggregated by urban/rural.
	Gender		Data can be disaggregated by gender.
	Age		Data can be disaggregated by age.
	Socio-economic Status		Data can be disaggregated by measures of SES which include income, and a household spending module.
	Disability		Data is not available for disability within the HH members.
Questionnaire	Pilot testing		There is no indication of field tests or pilot studies being done.
	Methodology		The questionnaire is implemented in a procedural stratified two stage sampling strategy using a system of PSU's and SSU's which select 36002 households from the sampling unit of the 1998 census.
	Length		The survey has 5 different modules which are carried out at different points in time and to reduce the overall fatigue to the respondent.
	Translation		The entire survey is translated into Urdu for implementation.
	Enumeration process		The sources are cross-checked both on the field and outside the field by supervisors in the office. Moreover, the data entry procedure takes place in the PBS' office itself which makes the data subject to frequent checks both for consistency and for data entry errors.

Field work and Data management	Quality control		The sources are cross-checked both on the field and outside the field by supervisors in the office.
	Data processing		The data is processed at the PBS office in Islamabad which the documentation states to undergo consistency checks as well.
	Data editing		No documentation on the treatment of missing data, variable ranges, editing or imputation of data.
Which indicators does this database have information on?	Literacy Rate		Literacy Rate can be measured using the data based on questions that ask all individuals aged 10 and over whether they can read or write with understanding and a final question asking if they can solve a simple maths problem. A detailed description is included in the indicator section.
	Enrolment/Attendance Rates (Gross and Net)		Attendance Rates can be measured from the underlying data by using variables capturing whether a child is enrolled in school or not and their age. A detailed description is included in the indicator section. Because this is household survey data, true enrolment figures may differ.
	Participation Rates		Participation Rate is measured in the survey from an individual going to school or not. A detailed description is included in the indicator section.
	Student Learning Outcomes		No information available.
	Retention Rates		No information Available
	Transition Rates		No information Available
	Completion Rates		The instruments collect information about children from individuals aged 4 and above about being enrolled, the type of school they are enrolled in as well as the current class/grade in which the child is enrolled which allows us to calculate completion rates.
	Dropout Rates		Dropout rates are measured from whether the individual is currently studying in a school or not and previously studied in a school or not. A detailed description is included in the indicator section.
	Teachers Number and Quality		No information Available
	School Environment		No information Available
	Finance		No information Available
	Accountability Relationships		No information Available

B.2.2 Summary of DQA: administrative data sources

DQA summaries are presented below for: (i) ASC/EMIS; and (ii) PSC.

Annex Table 6 Dashboard summary of Annual School Census (ASC/EMIS)

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		All public schools in all 36 districts of Punjab
	Non-Response Treatment		Since this is an administrative data conducted by the SED, there would be no schools for which there is non-response.
	Sampling Procedure		Administrative Data, No sampling
	Data Type		Time series data which can generally be used to construct a balanced panel for all the years.
	National		Data representative for the provincial level.
Sampling representivity	Province		Data representative at the provincial level.
	District		Data representative at the district level.
	School		Data is representative at the school level.
	Urban/rural		Data can be disaggregated by urban/rural.
	Gender		Data can be disaggregated by gender.
	Age		Data can disaggregated by age.
	Socio-economic Status		Data cannot disaggregated by socio economic status.
	Disability		Data for special children is available for 2014/15 onwards.
Questionnaire	Pilot testing		No information for the pilot is given.
	Methodology		Although, the survey instrument has been provided and basic information is available about the MEAs using tablets to collect the data, however, there is no field manual or other documentation is available.
	Length		The survey consists of a basic background sheet and 2 roster which amount to a total of 3 modules.
	Translation		Enumerators are local volunteers, so data collection is conducted in the local language. The survey instrument is also in the local language.
	Enumeration process		Data quality conducted in the field. Data entered through tablets which eradicates enumeration errors. Enumerators received training.
	Indicator link		Variables can be used to track indicators.
Field work and Data management	Quality control		MEAs are supervised by the District Monitoring Officer. Since MEA's are also tasked with monthly monitoring, they visit at least 4 schools per day and are rotated to prevent the formation of relationship with school staff. Information is gathered through tables with an online monitoring application.
	Data processing		Data is collected on electronic tablets. There is no further information available.

	Data editing		No documentation on the treatment of missing data, editing or imputation of data. Variable ranges are available in questionnaire.
Which indicators does this database have information on?	Literacy Rate		No information available
	Enrollment Rates (Gross and Net)		The enrollment rates can be measured through the available information on enrollment in classes, school type and population information obtained from external sources.
	Participation Rates		The participation rates can be measured through the available information on enrollment and population from external sources.
	Student Learning Outcomes		No information available
	Student Attendance		No information available
	Retention Rates		Please refer to the indicator sheet for further information.
	Transition Rates		Please refer to the indicator sheet for further information.
	Completion Rates		Please refer to the indicator sheet for further information.
	Dropout Rates		No information available
	Teachers Quality		Please refer to the indicator sheet for further information.
	School Environment		Please refer to the indicator sheet for further information.
	Finance		The information for school council/NSB and FTF amounts usage provides a basis for financial information for our data.
	Accountability Relationships		The information on school councils serve as basic information on the accountability of each school.

Annex Table 7 Dashboard summary of Private School Census (PSC)

DQA indicator	Description	Dashboard value	Notes
Survey design	Target population		All private schools in all 36 districts of Punjab
	Non-Response Treatment		Unclear how all private schools are identified and whether they willing to provide data.
	Sampling Procedure		Administrative data, no sampling.
	Data Type		Cross sectional data set.
	National		Data not representative for the national level.
Sampling representivity	Province		Data representative at the provincial level.
	District		Data representative at the district level.
	School		Data is representative at the school level.
	Urban/rural		Data can be disaggregated by urban/rural.
	Gender		Data can be disaggregated by gender.
	Age		Data cannot be disaggregated by age.
	Socio-economic status		Data cannot be disaggregated by socio economic status.
	Disability		Data on disability is not available.
Questionnaire	Pilot testing		No information for the pilot is given.
	Methodology		Although the survey instrument has been provided, field manual or other documentation is not available.
	Length		The survey consists of a one sheet instrument.
	Translation		No information about translation into local language is done.
	Enumeration process		MEAs in 2011 and private consultants in 2016.
	Indicator link		Variables can be used to track indicators.
Field work and Data management	Quality control		No information is made available.
	Data processing		There is no further information available.
	Data editing		No/limited documentation on the treatment of missing data, editing or imputation of data. Variable ranges for most variables are available in questionnaire.
Which indicators does this database have information on?	Literacy Rates		No information available
	Enrolment Rates (Gross and Net)		Only gross enrolment rates can be calculated if survey data is combined with external population data.
	Participation Rates		Participation rates can be calculated if survey data is combined with external population data.
	Student Learning Outcomes		No information available
	Student Attendance		No information available
	Retention Rates		Please refer to the indicator sheet for further information.
	Transition Rates		Please refer to the indicator sheet for further information.
	Completion Rates		Completion rates can be calculated if survey data is combined with external population data.
	Dropout Rates		No information available
	Teachers Quality		Please refer to the indicator sheet for further information.
	School Environment		Please refer to the indicator sheet for further information.
	Finance		No information available.
	Accountability Relationships		Please refer to the indicator sheet for further information.

Annex C Education Indicators in the PSLM

C.1 Indicators and disaggregation

This document presents education indicators that have been derived from the PSLM dataset for the Punjab province. This dataset contains weights for each observation to account for over or under representation with the population. Thus, indicators have been calculated with weights. We have raw data for the years 2012/13, 2013/14, 2014/15, 2015/16 and 2018/19.

Annex Table 8 PSLM: List of indicators

List of indicators
Participation
Enrolment/attendance [gross and net]
Drop-out
Literacy

As identified in the DQA exercise, a number of variables are available to better understand the variation in education indicators. The following variables have been selected for this analysis.

C.1.1 Demographic variables

Age group and their corresponding class levels are shown in the table below. These cut-offs are used by the Academy of Educational Planning and Management (AEPAM) under the Ministry of Federal Education & Professional Training. AEPAM combines the EMIS datasets and publishes national education statistics.

Annex Table 9 PSLM: Age groups and class levels

Age group	Class level
5-9 years	Primary: Classes 1-5
10-12 years	Middle: Classes 6-8
13-16 years	Secondary: Classes 9-12 (including polytechnic diploma)

Furthermore, it is important to note that all the statistics are calculated for the 5 to 16 years age bracket. Along with age, gender disaggregation is also available in the dataset.

C.1.2 School type

The PSLM provided detailed information on type of school. For our purposes we have combined these into broader categories, as shown below.

Annex Table 10 PSLM: School categories

Data analysis categories	PSLM categories
Government	Government
Private	Private
	NGO, Foundation, Trust
	Privately

Madrassa	Deeni Madrassa
Other	Non Formal Basic Education
	Other

C.1.3 Expenditure/Income

To understand inequality in education levels, monthly expenditure and income quintiles have been utilized as a proxy for poverty. In calculating these quintiles at the per capita level, we have made the assumption of equal distribution within the household. Expenditure data is collected through the Household Integrated Economic Survey (HIES), which was jointly conducted with the PSLM in the years 2013/15 and 2015/16. Expenditure is used instead of income as income is underreported in the dataset. The methodology that we use to calculate expenditure calculates per month per adult equivalent food poverty using the provided dataset. It generates an average per month per adult equivalent food expenditure for household using per capita expenditure. Expenditure quintiles are also used in the PSLM report. The per capita cut-offs are available for each year below for Punjab.

Annex Table 11 PSLM and HIES: Expenditure quintiles (PKR)

	2013/14	2015/2016
1st (poorest)	1,048.5 to 3,114.7	960.5 to 3,425.97
2nd	3,116.2 to 4,407.5	3,429.2 to 4,388.9
3rd	4,408.4 to 6,591.4	4,390.2 to 5,599.4
4th	6,592.7 to 12,709.2	5,600.6 to 7,829.9
5th (richest)	12,711.7 to 276,191.8	7,833.0 to 162,961.4

In 2012/13, 2014/15 and 2018/19 the PSLM survey was carried out and we have used income as a proxy for poverty for these rounds. Income from the main occupation of earning members has been aggregated at the household and annual level, and then divided by household size and 12 months.

Annex Table 12 PSLM: Income quintiles (PKR)

	2012/2013	2014/2015	2018/19
1st (poorest)	11.1 to 1166.7	12.5 to 1,229.2	11.7 to 2,000.0
2nd	1,169.6 to 1,800.0	1,230.0 to 1,875.0	2,002.4 to 2,833.3
3rd	1,802.4 to 2,571.4	1,876.0 to 2,653.8	2,834.6 to 3,861.1
4th	2,572.0 to 4,000.0	2,656.3 to 4,000.0	3,865.7 to 5,666.7
5th (richest)	4,010.4 to 550,000.0	4,006.9 to 500,000.0	5,672.7 to 300,000

C.1.4 Geographical variables

To understand spatial variation, urban/rural and provincial categorical variables are also included in this analysis.

This annex is organized as follows – under each indicators there are several type of tables. First, overall tables provide the indicator across selected and available secondary variables (i.e. participation rate by gender). Second, there significance tables presenting results of group-wise t-tests of indicators, where possible. For enrolment rates this is followed by gender wise statistics by school type, wealth quintiles and urban/rural (i.e. GER for girls in government schools). Lastly, there are provincial comparison tables.

C.2 Participation

The participation rate measures how many children report that they are currently attending school, in comparison to the remaining population. This variable has been calculated from the educational status question in the dataset which records whether a household member is currently studying in any institution.

PR = [children 5-16 years who are current attending school] / [all children]

…where all children includes those that currently attending school, those who never attended school and those that previously attended school.

C.2.1 Overall participation tables

These tables provide overall participation rates and by age, gender, expenditure quintiles and urban/rural. For instance, in 2013/14 73.2% of the children aged 5-16 years are participating in schools, when accounting for population weights. The remainder of the table provides participation rate over various categories (row percentages). This means that in 2013/14, 68.3% of girls and 78% of boys are participating in schools.

Column percentages have been calculated for the school type category as data for that variable is only available for children that are participating in school. This means that of the children that are participating in schools, 56.5% are going to government schools in 2013/14.

Annex Table 13 PSLM: Participation rate

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Overall	17098022	74.6	19360726	73.2	20564467	74.6	20393990	73.8	26203513	79.1
Age group										
5-9 years	8102087	79.2	9046633	78.7	9842853	79.7	9790376	79.6	12712548	85.0
10-12 years	4648072	81.0	5331336	79.6	5477130	81.3	5599873	81.2	6992841	84.7
13-16 years	4347863	62.7	4982757	60.4	5244484	61.8	5003740	59.5	6498124	65.5
Gender										
Female	7860498	70.9	8854312	68.3	9590893	71.1	9374458	69.2	12528884	76.7
Male	9237524	78.2	10506414	78.0	10973574	77.9	11019532	78.3	13674629	81.4
Income or expenditure quintile										
1st (poorest)	3580145	66.7	3572507	53.6	3319943	66.1	5041048	56.9	4812440	68.8
2nd	3340163	70.0	4293468	71.9	3731303	68.9	4240596	71.5	4210551	71.6
3rd	3158402	73.7	4452164	82.4	3566816	73.0	4171282	80.0	4667215	80.4
4th	2980584	78.5	3485603	85.9	3999359	76.6	3879987	88.9	4846904	83.7
5th (richest)	2658977	85.5	2853119	85.1	4383964	83.8	3061077	94.3	5233490	88.4
Location										
Rural	11408578	70.6	12568621	68.6	13382435	69.6	13216698	69.1	16325584	75.2
Urban	5689444	84.2	6792105	83.6	7182033	86.0	7177292	84.5	9877929	86.4
Share by school type										
Government	10352161	60.5	10929728	56.5	11635889	56.6	11037602	54.1	14481542	55.3
Private	6394888	37.4	8300152	42.9	8679133	42.2	8852605	43.4	11412740	43.6
Madrassa	323923	1.9	97977	0.5	198362	1.0	453298	2.2	248060	0.9
Other	27051	0.2	31156	0.2	51084	0.2	50,485	0.3	61172	0.2
Total	17098022	100.0	19359013	100.0	20564467	100.0	20393990	100.0	26203513	100.0

C.2.2 Group-wise significance

The table below shows the difference in participation rates over various groups – age, gender, expenditure/income and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 14 PSLM: Participation rate, group-wise significance

Participation	2012/13	2013/14	2014/15	2015/16	2018/19
Age group					
diff. (5-9 years) – (10-12 years)	-.018***	-0.009	-.016**	-0.016	0.003
diff. (5-9 years) – (13-16 years)	.166***	.184***	.179***	.201***	.195***
diff. (10-12 years) – (13-16 years)	.183***	.192***	.195***	.217***	.192***
Gender					
diff. (Female) – (Male)	-0.073***	-.097***	-.069***	-.091***	-.047***
Income or expenditure quintile					
diff. (1) – (2)	-.034***	-.183***	-.029**	-.146***	-.028*
diff. (1) – (3)	-.071***	-.289***	-.069***	-.231***	-.117***
diff. (1) – (4)	-.118***	-.323***	-.106***	-.320***	-.150***
diff. (1) – (5)	-.188***	-.316***	-.177***	-.374***	-.196***
diff. (2) – (3)	-.037***	-.106***	-.041***	-.085***	-.089***
diff. (2) – (4)	-.084***	-.140***	-.077***	-.173***	-.121***
diff. (2) – (5)	-.154***	-.133***	-.148***	-.228***	-.168***
diff. (3) – (4)	-.047***	-.035*	-.036**	-.089***	-.033**
diff. (3) – (5)	-.118***	-0.027	-.108***	-.143***	-.079***
diff. (4) – (5)	-.070***	0.008	-.072***	-.054***	-.046***
Location					
diff. (Rural) – (Urban)	-.136***	-.150***	-.164***	-.154***	-.111***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in participation rates over the earliest and latest rounds, and other various groups.

Annex Table 15 PSLM: Participation rate, significance over time

	diff. (2012) - (2018)
Overall	-.045***
Age Group	
5-9 years	-.058***
10-12 years	-.038***
13-16 years	-.029**
Gender	
Female	-.059***
Male	-.032***
Income or expenditure quintile	
1st (poorest)	-.021
2nd	-.016
3rd	-.067***
4th	-.053***
5th (richest)	-.029**
Location	
Rural	-.046***
Urban	-.022**

*p<0.05, **p<0.01, ***p<0.001

C.2.3 Provincial comparison

This section provides national geographical comparisons in participation rates. For instance in 2013/14 the participation rate is highest in Punjab at 73.2% in comparison to the national average of 66.5%, when accounting for population weights.

Annex Table 16 PSLM: Participation rate by province

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Punjab	17098022	74.6	19360726	73.2	20564467	74.6	20393990	73.8	26203513	79.1
KPK	4593178	70.9	5337536	68.2	5971953	72.9	5399864	68.8	8421958	68.9
Sindh	6037892	60.3	7405537	56.2	7962975	61.2	7224198	56.4	8531853	58.4
Balochistan	1252263	52.0	1553680	49.2	1747236	56.6	1199983	44.4	1804762	41.0
Total	28981354	69.3	33657479	66.5	36246630	69.9	34218034	67.1	44962085	69.9

The table below captures the difference between Punjab and other provinces in Pakistan on the participation rate. Stars have used to depict statistical significance.

Annex Table 17 PSLM: Participation rate, significance by province

	2012/2013	2013/14	2014/15	2015/16	2018/19
diff. (Punjab) – (KP)	.038***	.050***	.016**	.051***	.103***
diff. (Punjab) – (Sindh)	.143***	.170***	.134***	.175***	.207***
diff. (Punjab) – (Balochistan)	.226***	.240***	.179***	.295***	.381***

*p<0.05, **p<0.01, ***p<0.001

C.3 Gross enrolment ratio (GER)

The enrolment/attendance indicators have been calculated as per the formulas identified in the DQA document. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely which class the family member is studying in these days. Moreover participation looks at broader school attendance irrespective of class levels.

The gross enrolment ratio (GER) calculates participation in schooling by educational level. The formula for primary GER is:

GER = [number of children in primary school] / [total population of children at primary age]

GER is all the people that are enrolled at a certain level of education over the number of people that correspond to that level of education. As PSLM gathers education information on household members from 4 years of age[55], the statistics below include people at the age of 4 years and above.

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary GER is calculated as the number of children at the primary level in government schools over the number of children at primary age. This means that the school type numbers provide the share of total GER by provider.

C.3.1 Overall GER

The tables below show the GERs by primary, middle and secondary over certain categories. For instance, in 2013/14 the overall primary GER is 100.1%, when accounting for population weights. School type disaggregations together equal the overall GER numbers. While overall primary GER is 100.1%, government share of primary GER is 56.1% in 2013/14.

Annex Table 18 PSLM: Primary (class 1-5) GER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	98.2	100.1	96.7	93.2	94.8
Gender					
Male	102.1	105.5	101.4	98.7	97.6
Female	94.0	94.3	91.7	87.6	91.9
Income or expenditure quintile					
1st (poorest)	85.8	88.4	83.7	84.1	82.4
2nd	94.7	100.9	92.9	88.7	90.8
3rd	102.2	104.2	96.1	99.4	100.5
4th	107.0	96.9	101.1	100.9	102.2
5th (richest)	107.5	105.8	108.8	106.2	102.7
Location					
Rural	94.3	96.0	91.7	88.5	91.3
Urban	108.3	109.9	109.2	104.9	101.8

[55] PSLM 2018/19 gathers data on children 3 years and above.

Share of school type					
Government	60.1	56.1	54.1	50.5	52.0
Private	37.4	43.6	41.9	41.7	42.0
Madrassa	0.6	0.0	0.4	0.8	0.5
Other	0.1	0.1	0.3	0.2	0.2

Annex Table 19 PSLM: Middle (class 6-8) GER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	59.8	58.7	59.4	55.9	62.2
Gender					
Male	61.8	59.7	61.3	56.6	61.4
Female	57.6	57.6	57.4	55.0	63.1
Income or expenditure quintile					
1st (poorest)	44.8	32.8	46.7	33.7	44.9
2nd	50.0	56.7	48.5	54.8	50.6
3rd	59.3	71.1	55.8	66.9	66.2
4th	67.6	68.5	63.9	78.9	68.7
5th (richest)	85.5	77.2	81.1	78.5	79.1
Location					
Rural	53.8	53.0	52.9	50.7	57.9
Urban	73.7	71.3	74.7	67.4	70.1
Share of school type					
Government	39.9	35.6	37.6	34.1	39.0
Private	19.3	22.8	21.3	21.1	22.7
Madrassa	0.6	0.0	0.4	0.6	0.4
Other	0.0	0.2	0.1	0.0	0.1

Annex Table 20 PSLM: Secondary (class 9-12) GER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	50.7	51.3	48.8	51.3	56.1
Gender					
Male	54.6	56.5	52.6	56.8	58.8
Female	46.6	46.5	45.0	46.1	53.5
Income or expenditure quintile					
1st (poorest)	33.7	19.2	34.5	18.3	35.8
2nd	36.2	41.7	32.4	39.3	32.1
3rd	42.8	64.6	39.8	54.2	46.2
4th	57.5	83.8	49.4	75.6	61.5
5th (richest)	82.1	64.9	72.4	115.8	91.4
Location					
Rural	41.6	40.7	38.7	41.2	45.6
Urban	70.4	73.1	68.9	71.6	75.2
Share of school type					
Government	32.5	29.1	29.4	31.0	33.6
Private	17.7	21.8	19.2	20.0	21.7
Madrassa	0.4	0.0	0.2	0.2	0.7
Other	0.1	0.1	0.1	0.1	0.2

C.3.2 Gender disaggregation

The tables below provide gender disaggregated GERs for primary, middle and secondary levels. The tables provide enrolment statistics by expenditure and urban/rural, and gender. For instance in 2013/14, primary GER in rural areas is higher for boys at 103.6% in comparison to that of girls at 88%.

School type disaggregations together equal the overall GER numbers for girls and boys. While overall primary GER for boys is 105.5%, the government share of primary GER for boys is 57.6% in 2013/14.

Annex Table 21 PSLM: Primary GER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	91.5	80.0	98.2	78.8	88.6	78.6	93.1	74.8	85.2	79.6
2nd	98.0	91.1	106.8	94.7	100.6	85.3	96.2	81.4	92.8	88.7
3rd	106.6	97.4	110.5	97.6	98.8	93.3	104.9	94.2	102.7	98.1
4th	107.3	106.8	98.6	94.9	105.5	96.2	102.1	99.6	105.7	98.5
5th (richest)	111.8	102.7	105.0	106.7	111.7	105.5	103.6	109.3	106.3	99.2
Location										
Rural	99.5	88.6	103.6	88.0	98.1	85.0	95.5	81.2	94.5	88.0
Urban	108.6	108.0	110.2	109.7	110.0	108.4	106.4	103.3	104.0	99.6
Share of school type										
Government	61.4	58.5	57.6	54.5	55.6	52.7	52.2	48.9	53.2	50.8
Private	39.8	34.7	47.5	39.5	45.2	38.4	45.2	38.0	43.6	40.4
Madrassa	0.6	0.6	0.4	0.2	0.4	0.3	1.1	0.5	0.6	0.5
Other	0.1	0.2	0.1	0.1	0.3	0.3	0.2	0.3	0.3	0.2

Annex Table 22 PSLM: Middle GER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	51.2	38.3	39.4	25.6	52.8	40.4	34.1	33.3	48.7	41.0
2nd	51.5	48.3	57.2	56.0	50.4	46.5	59.8	48.5	51.9	49.4
3rd	59.1	59.4	63.9	79.6	56.9	54.6	70.3	63.6	57.2	77.9
4th	69.2	65.9	67.1	69.9	66.8	60.5	73.4	85.6	62.4	75.7
5th (richest)	86.5	84.4	82.5	70.8	78.9	83.6	78.0	79.0	79.0	79.1
Location										
Rural	58.7	48.4	54.9	50.7	57.9	47.3	52.8	48.3	58.2	57.5
Urban	69.2	78.4	70.8	71.8	69.7	79.8	65.4	69.7	67.3	73.2
Share of school type										
Government	41.8	38.0	36.7	34.3	39.3	35.7	35.0	33.0	38.1	40.0
Private	19.6	19.0	22.5	23.0	21.4	21.2	20.6	21.7	22.7	22.6
Madrassa	0.5	0.7	0.3	0.0	0.4	0.4	1.0	0.2	0.3	0.4
Other	0.0	0.0	0.2	0.2	0.1	0.1	0.0	0.1	0.2	0.0

Annex Table 23 PSLM: Secondary GER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	39.0	28.6	23.3	15.5	40.3	29.6	23.8	13.2	41.5	31.2
2nd	39.3	33.2	47.0	37.4	34.8	30.1	42.9	35.9	34.8	29.7
3rd	43.8	41.7	69.3	60.3	41.7	38.0	61.1	47.4	50.9	41.8
4th	60.2	54.5	94.1	74.2	51.9	46.8	79.3	72.0	55.2	68.1
5th (richest)	86.5	77.2	66.0	63.6	75.9	68.6	121.7	110.0	92.8	89.8
Location										
Rural	47.2	35.9	47.1	34.8	43.9	33.4	49.2	33.8	52.2	39.5
Urban	70.7	70.2	75.8	70.6	70.4	67.4	71.2	72.0	70.3	80.2
Share of school type										
Government	36.1	28.7	33.2	25.3	32.1	26.6	34.9	27.3	35.3	31.9
Private	18.1	17.3	23.1	20.7	20.2	18.2	21.6	18.5	22.9	20.6
Madrassa	0.4	0.4	0.2	0.4	0.2	0.1	0.2	0.2	0.6	0.8
Other	0.1	0.1	0.1	0.2	0.0	0.1	0.1	0.0	0.1	0.3

C.3.3 Provincial comparison

These tables provide national geographical comparison of GERs. For instance in 2013/14, primary GER in Punjab is 100.1%, when accounting for population weights.

Annex Table 24 PSLM: Primary GER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	98.2	100.1	96.7	93.2	94.8
KPK	90.9	89.3	90.3	87.8	86.0
Sindh	80.7	76.3	78.8	77.7	77.9
Balochistan	73.0	67.3	70.6	59.6	56.5

Annex Table 25 PSLM: Middle GER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	59.8	58.7	59.4	55.9	62.2
KPK	60.8	61.2	61.4	60.3	58.8
Sindh	47.8	46.4	46.3	43.0	45.4
Balochistan	39.4	40.6	40.2	29.3	38.0

Annex Table 26 PSLM: Secondary GER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	50.7	51.3	48.8	51.3	56.1
KPK	48.2	43.0	47.1	41.8	41.7
Sindh	46.0	39.0	46.9	38.0	42.6
Balochistan	25.7	22.9	30.2	24.3	22.4

C.4 Net enrolment ratio (NER)

The enrolment/attendance indicators have been calculated as per the formulas identified in the DQA document. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely which class the family member is studying in these days. Moreover participation looks at broader school attendance irrespective of class levels.

The net enrolment ratio (NER) calculates participation in schooling by both age and educational level. The formula for primary NER is:

NER = [number of children at primary age in primary school] / [total population of children at primary age]

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary NER is calculated as the number of children at the primary level, in government schools and of primary age,

over the number of children at primary age. This means that the school type numbers provide the share of total NER.

C.4.1 Overall NER

The tables below show the NER by primary, middle and secondary over certain categories. For instance, in 2013/14 the overall primary NER is 64.3%, when accounting for population weights. The remaining percentages are absolute value in that they provide NERs for specific groups. For instance, primary NER for girls is 62.7% in comparison to that for boys at 65.8% in 2013/14.

School type disaggregations together equal the overall NER numbers. While overall primary NER is 64.3%, the government share of primary NER is 33.9% in 2012/14.

Annex Table 27 PSLM: Primary (class 1-5) NER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	62.3	64.3	61.1	58.8	59.6
Gender					
Male	64.0	65.8	62.9	59.6	59.2
Female	60.5	62.7	59.2	57.9	60.0
Income or expenditure quintile					
1st (poorest)	53.1	50.8	52.1	48.4	52.0
2nd	59.9	63.4	55.3	54.9	53.4
3rd	63.4	69.5	61.1	63.8	60.5
4th	67.8	70.9	65.4	68.8	64.1
5th (richest)	72.5	74.0	70.8	72.2	69.6
Location					
Rural	59.4	61.4	57.3	55.1	56.8
Urban	69.8	71.6	70.4	67.7	65.2
Share of school type					
Government	36.4	33.9	32.4	29.4	30.3
Private	25.5	30.3	28.2	28.8	28.7
Madrassa	0.3	0.0	0.2	0.5	0.3
Other	0.1	0.0	0.2	0.1	0.2

Annex Table 28 PSLM: Middle (class 6-8) NER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	24.9	24.8	24.5	23.8	27.4
Gender					
Male	24.3	25.1	24.5	23.8	26.5
Female	25.5	24.5	24.5	23.9	28.4
Income or expenditure quintile					
1st (poorest)	17.9	10.7	19.6	12.9	18.4
2nd	19.4	24.2	18.0	21.4	20.2
3rd	23.2	28.7	22.0	26.9	26.1
4th	28.5	34.8	25.2	36.2	28.4
5th (richest)	39.5	36.6	37.0	41.0	42.0
Location					
Rural	21.5	21.1	20.9	20.9	24.3
Urban	32.7	32.9	33.0	30.4	33.0
Share of school type					
Government	15.5	14.2	14.5	13.7	15.2
Private	9.1	10.5	9.9	9.9	12.0
Madrassa	0.2	0.0	0.1	0.2	0.2
Other	0.0	0.1	0.0	0.0	0.0

Annex Table 29 PSLM: Secondary (class 9-12) NER (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Overall	27.0	28.1	27.1	27.4	31.3
Gender					
Male	27.8	30.3	27.4	29.3	31.9
Female	26.1	26.2	26.9	25.6	30.8
Income or expenditure quintile					
1st (poorest)	18.5	10.7	20.2	10.9	20.7
2nd	19.7	24.1	18.4	21.5	18.5
3rd	23.4	36.5	22.2	30.0	26.5
4th	29.9	45.4	26.5	38.8	32.7
5th (richest)	42.4	34.1	39.6	58.6	48.6
Location					
Rural	22.5	22.5	21.4	21.1	26.2
Urban	36.7	39.7	38.7	40.0	40.5
Share of school type					
Government	17.4	16.5	17.0	16.4	18.9
Private	9.3	11.4	10.1	10.9	12.1
Madrassa	0.2	0.0	0.1	0.0	0.3
Other	0.0	0.1	0.0	0.1	0.1

C.4.2 Gender disaggregation

The tables below provide gender disaggregated NERs for primary, middle and secondary levels. The table provides enrolment statistics by expenditure and urban/rural, and gender. For instance in 2013/14, primary NER in rural areas is higher for boys at 63.8% in comparison to that of girls at 58.8%.School type disaggregations together equal the overall NER numbers for girls and boys. While overall primary NER for girls 62.7%, the government share of primary NER for girls is 34.7% in 2013/14.

Annex Table 30 PSLM: Primary NER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	56.4	49.8	54.2	47.4	55.6	48.5	51.5	45.1	52.8	51.3
2nd	60.7	59.0	64.5	62.2	58.3	52.4	55.2	54.7	51.6	55.2
3rd	63.4	63.3	71.0	67.9	61.2	60.9	66.2	61.5	58.9	62.1
4th	69.0	66.4	71.4	70.3	67.5	63.0	66.0	71.9	63.2	65.1
5th (richest)	74.5	70.1	72.6	75.6	70.4	71.3	69.7	75.1	69.3	69.8
Location										
Rural	61.8	56.9	63.8	58.8	60.0	54.4	56.8	53.4	56.8	56.8
Urban	69.4	70.2	70.9	72.3	70.0	70.9	66.6	68.9	64.2	66.2
Share by school type										
Government	36.6	36.2	33.0	34.7	32.7	32.1	28.8	30.1	29.3	31.4
Private	26.9	23.9	32.5	27.9	29.8	26.6	30.2	27.4	29.3	28.1
Madrassa	0.3	0.3	0.2	0.1	0.1	0.2	0.6	0.3	0.3	0.4
Other	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.3	0.1

Annex Table 31 PSLM: Middle NER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	20.0	15.8	13.1	8.0	22.1	17.0	12.8	13.1	21.1	15.6
2nd	19.4	19.5	23.9	24.5	17.6	18.4	23.5	18.8	18.8	21.6
3rd	20.9	25.6	27.5	30.1	21.6	22.4	28.7	25.1	24.2	28.5
4th	28.2	28.8	33.6	36.0	25.4	25.1	32.5	40.7	23.9	33.4
5th (richest)	36.2	43.1	35.4	38.2	34.9	39.4	40.3	41.8	38.9	45.4
Location										
Rural	22.6	20.4	21.8	20.3	22.5	19.2	22.0	19.6	24.6	24.0
Urban	28.6	36.8	32.7	33.2	29.5	36.6	28.0	33.2	30.1	36.2
Share by school type										
Government	15.4	15.6	14.4	14.1	14.6	14.5	14.0	13.4	14.3	16.1
Private	8.8	9.5	10.6	10.4	9.7	10.0	9.6	10.3	12.0	12.0
Madrassa	0.1	0.3	0.0	0.0	0.2	0.0	0.3	0.1	0.1	0.2
Other	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0

Annex Table 32 PSLM: Secondary NER by gender (%)

	2012/13		2013/14		2014/15		2015/16		2018/19	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Income or expenditure quintile										
1st (poorest)	20.8	16.2	13.8	7.7	22.3	18.5	13.3	8.6	24.5	17.5
2nd	21.2	18.2	26.2	22.4	18.0	18.7	22.1	20.8	19.9	17.3
3rd	22.9	23.8	37.3	35.7	21.5	22.9	33.3	26.6	27.1	26.0
4th	29.4	30.3	49.4	41.8	26.3	26.7	40.1	37.5	29.9	35.8
5th (richest)	41.6	43.4	34.5	33.6	39.9	39.2	58.5	58.7	46.1	51.5
Location										
Rural	24.7	20.2	26.6	18.7	23.0	19.7	24.3	18.0	29.0	23.7
Urban	34.4	39.1	37.7	41.5	36.4	40.8	38.8	41.4	36.8	44.3
Share by school type										
Government	18.8	16.0	18.4	14.8	17.4	16.5	18.3	14.6	19.3	18.5
Private	8.7	9.9	11.8	11.1	9.8	10.3	10.9	10.8	12.3	11.9
Madrassa	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.4	0.2
Other	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1

C.4.3 Provincial comparison

These tables provide a national provincial comparison of NERs. For instance, in 2013/14 primary NERs are highest in Punjab at 64.3%.

Annex Table 33 PSLM: Primary NER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	62.3	64.3	61.1	58.8	59.6
KPK	53.9	54.2	56.4	52.6	47.8
Sindh	52.3	48.5	51.0	48.3	47.7
Balochistan	44.7	38.7	46.1	32.7	33.0

Annex Table 34 PSLM: Middle NER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	24.9	24.8	24.5	23.8	27.4
KPK	20.5	19.8	21.0	18.0	18.2
Sindh	19.2	17.4	17.8	14.7	15.6
Balochistan	14.3	12.5	13.3	8.9	11.4

Annex Table 35 PSLM: Secondary NER by province (%)

	2012/13	2013/14	2014/15	2015/16	2018/19
Punjab	27.0	28.1	27.1	27.4	31.3
KPK	24.7	23.2	25.7	22.8	21.5
Sindh	23.5	20.2	24.2	20.0	20.3
Balochistan	13.3	12.3	14.7	10.7	11.8

C.5 Drop-out rate

Since the PSLM gathers cross-sectional (and not time series) data, drop-out cannot be calculated directly. Similar to the participation indicator, the drop-out rate measures how many people have previously attended school in comparison to the remaining population. In certain rounds there is a question on the education background of the child which allows us to calculate drop-out directly. In other rounds, this question is not available and drop-out has been calculated from a combination of two questions – if the child is currently attending school and if the child previously attended school.

DR = [children who previously attended school aged 5-16 years] / [all children aged 5-16 years]

Where all children includes those that have previously attended school, those who are currently attending school and those that have never attended school.

C.5.1 Overall drop-out rate

These tables provide an overall drop-out rate and further disaggregation of this rate by age, gender, expenditure quintiles and urban/rural. For instance the overall drop-out rate for 5-16 years is 8.8% in 2013/14. Moreover, the drop-out is higher for girls at 9.8%.

Annex Table 36 PSLM: Drop-out rate

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Overall	1801021	7.9	2322927	8.8	2222547	8.1	2376861	8.6	2377934	7.2
Age group										
5-9 years	54300	0.5	102047	0.9	86949	0.7	63041	0.5	56682	0.4
10-12 years	291579	5.1	426078	6.4	324783	4.8	372021	5.4	383184	4.6
13-16 years	1455143	21.0	1794801	21.7	1810815	21.3	1941798	23.1	1938067	19.5
Gender										
Female	930727	8.4	1273144	9.8	1160245	8.6	1243591	9.2	1180474	7.2
Male	870294	7.4	1049783	7.8	1062301	7.5	1133270	8.1	1197459	7.1
Income or expenditure quintile										
1st(poorest)	420253	7.8	725429	10.9	428987	8.5	1022674	11.5	502328	7.2
2nd	413355	8.7	655454	11.0	442874	8.2	575093	9.7	470570	8.0
3rd	378852	8.8	359936	6.7	444755	9.1	447088	8.6	466007	8.0
4th	327649	8.6	205835	5.1	455893	8.7	248428	5.7	467334	8.1
5th(richest)	197734	6.4	212659	6.3	362337	6.9	83578	2.6	376043	6.3
Location										
Rural	1361641	8.4	1631938	8.9	1664773	8.7	1757885	9.2	1630846	7.5
Urban	439380	6.5	690989	8.5	557774	6.7	618976	7.3	747087	6.5

C.5.2 Group-wise significance tables

The table below show the difference in drop-out rates over various groups – age, gender, expenditure/income and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 37 PSLM: Drop-out rate, group-wise significance

Drop-out	2012/13	2013/14	2014/15	2015/16	2018/19
Age group					
diff. (5-9 years) – (10-12 years)	-.045***	-.055***	-.041***	-.049***	-.043***
diff. (5-9 years) – (13-16 years)	-.204***	-.209***	-.206***	-.226***	-.192***
diff. (10-12 years) – (13-16 years)	-.159***	-.154***	-.165***	-.177***	-.149***
Gender					
diff. (Female) – (Male)	.010***	.020***	.011***	.011	.001
Income or expenditure quintile					
diff. (1) – (2)	-.008*	-.001	.004	.018	-.008
diff. (1) – (3)	-.010*	.042***	-.006	.030**	-.009
diff. (1) – (4)	-.008	.058***	-.002	.059***	-.009
diff. (1) – (5)	.015**	.045***	.016**	.090***	.008
diff. (2) – (3)	-.002	.043***	-.009	.011	-.000
diff. (2) – (4)	.000	.059***	-.006	.040**	-.000
diff. (2) – (5)	.023***	.046***	.013*	.071***	.0166*
diff. (3) – (4)	.002	.016*	.004	.029*	-.000
diff. (3) – (5)	.025***	.003	.022***	.060***	.017*
diff. (4) – (5)	.023***	-.013	.018**	.031**	.017*
Location					
diff. (Rural) – (Urban)	.019***	.004	.020***	.019***	.010*

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in drop-out rates over the earliest and latest rounds, and other various groups.

Annex Table 38 PSLM: Drop-out rate, significance over time

	diff. (2012) - (2018)
Overall	.007**
Age Group	
5-9 years	.002
10-12 years	.004
13-16 years	.014*
Gender	
Female	.012**
Male	.002
Income or expenditure quintile	
1st (poorest)	.006
2nd	.007

3rd	.008
4th	.006
5th (richest)	.000
Location	
Rural	.009**
Urban	-.000

*p<0.05, **p<0.01, ***p<0.001

C.5.3 Provincial comparison

The table below provides national geographical comparisons in drop-out rates. For instance, in 2013/14 the drop-out rate is highest in Punjab at 8.8% in comparison to the national average of 7.5%, when account for population weights.

Annex Table 39 PSLM: Drop-out rate by province

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Punjab	1801021	7.9	2322927	8.8	2222547	8.1	2376861	8.6	2377934	7.2
KPK	333074	5.1	431317	5.5	377603	4.6	448758	5.7	748287	6.1
Sindh	573916	5.7	863093	6.6	788400	6.1	950074	7.4	894514	6.1
BL	136963	5.7	166558	5.3	142860	4.6	138901	5.1	208214	4.7
Total	2844974	6.8	3783895	7.5	3531410	6.8	3914594	7.7	4228949	6.6

The table below captures the difference between Punjab and other provinces in Pakistan on the drop-out rate. Stars have used to depict statistical significance.

Annex Table 40 PSLM: Drop-out rate significance by province

Drop-out	2012/13	2013/14	2014/15	2015/16	2018/19
diff. (Punjab) – (KP)	.027***	.033***	.034***	.029***	.011**
diff. (Punjab) – (Sindh)	.021***	.022***	.020***	.012*	.011**
diff. (Punjab) – (Balochistan)	.022***	.035***	.034***	.035***	.025***

*p<0.05, **p<0.01, ***p<0.001

C.6 Literacy rate

The literacy rate measures if a person can at least read (or write) with understanding. In the PSLM survey this question is administered to those 10 years and above. Thus, the statistics below are from the 10 years and above age bracket.

LR = [people who can at least read with understanding] / [total population]

C.6.1 Overall literacy rate

These tables provide overall literacy rates and further disaggregation by age, gender, expenditure quintiles and urban/rural. For instance, in 2013/14 at least 62.4% of the population can read. The remaining figures provide literacy rates over various groups.

Annex Table 41 PSLM: Literacy rate

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Overall	34666752	62.6	41984429	62.4	42522089	62.8	42387865	62.5	54360079	65.4
Age Group										
10-19 years	13832638	79.3	16398537	78.6	16678278	78.7	16812961	78.4	20669146	82.4
20-29 years	8924432	71.6	11096740	71.8	11000353	70.9	10853803	72.1	13656811	74.7
30-39 years	5101059	60.2	6330715	62.2	6392277	61.7	6168513	58.9	8724285	63.6
40-59 years	5296421	45.1	6273235	44.0	6513935	45.1	6646046	45.9	8838032	48.6
60+ years	1512202	29.1	1885202	29.0	1937246	31.2	1906543	29.8	2471806	31.5
Gender										
Female	15166962	53.9	18682384	53.8	18833310	54.7	18915163	53.8	24904984	58.0
Male	19499789	71.7	23302045	71.6	23688779	71.1	23472702	71.8	29455095	73.3
Income or expenditure quintile										
1st(poorest)	4659191	50.8	4906306	43.2	4531505	51.8	6459651	42.4	5936020	48.3
2nd	5123821	54.6	6727450	56.2	5573335	53.5	7105660	55.4	6005399	51.5
3rd	5959391	59.7	8797951	65.3	6402400	57.1	8728230	63.1	8602042	61.8
4th	7360638	65.4	8295151	70.9	9058618	63.0	9548011	71.7	11720744	68.5
5th(richest)	9426936	76.0	9126734	73.4	14445558	74.7	10546314	83.5	18298445	80.4
Location										
Rural	20552111	55.4	23989904	54.6	24548439	55.2	24414802	54.7	29539463	57.6
Urban	14114641	77.3	17994525	77.2	17973650	77.5	17973063	77.4	24820616	77.9

C.6.2 Group-wise significance

The table below shows the difference in literacy rates over various groups – age, gender, expenditure/income and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 42 PSLM: Literacy rate, group-wise significance

	2012/13	2013/14	2014/15	2015/16	2018/19
Age group					
diff. (10-19 years) – (20-29 years)	.077***	.068***	.078***	.063***	.077***
diff. (10-19 years) – (30-39 years)	.190***	.164***	.170***	.196***	.187***
diff. (10-19 years) – (40-59 years)	.342***	.346***	.337***	.326***	.337***
diff. (10-19 years) – (60+ years)	.502***	.496***	.475***	.487***	.508***
diff. (20-29 years) – (30-39 years)	.113***	.096***	.092***	.132***	.110***
diff. (20-29 years) – (40-59 years)	.265***	.278***	.258***	.262***	.260***
diff. (20-29 years) – (60+ years)	.425***	.427***	.397***	.423***	.431***
diff. (30-39 years) – (40-59 years)	.152***	.182***	.167***	.130***	.150***
diff. (30-39 years) – (60+ years)	.312***	.331***	.305***	.291***	.321***
diff. (40-59 years) – (60+ years)	.160***	.150***	.138***	.162***	.171***
Gender					
diff. (Female) – (Male)	-.178***	-.177***	-.164***	-.180***	-.152***
Income or expenditure quintile					
diff. (1) – (2)	-.038***	-.130***	-.018*	-.130***	-.032**
diff. (1) – (3)	-.089***	-.221***	-.053***	-.207***	-.136***
diff. (1) – (4)	-.147***	-.277***	-.112***	-.293***	-.202***
diff. (1) – (5)	-.252***	-.302***	-.229***	-.411***	-.322***
diff. (2) – (3)	-.051***	-.091***	-.035***	-.077***	-.103***
diff. (2) – (4)	-.109***	-.147***	-.095***	-.163***	-.170***
diff. (2) – (5)	-.214***	-.172***	-.211***	-.281***	-.289***
diff. (3) – (4)	-0.58***	-.056***	-.059***	-.086***	-.067***
diff. (3) – (5)	-.163***	-.081***	-.176***	-.204***	-.186***
diff. (4) – (5)	-.105***	-.025*	-.117***	-.118***	-.119
Location					
diff. (Rural) – (Urban)	-.219***	-.226***	-.223***	-.227***	-.203***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in literacy rates over the earliest and latest rounds, and other various groups.

Annex Table 43 PSLM: Literacy rate, significance over time

	diff. (2012) - (2018)
Overall	-.028**
Age group	
10-19 years	-.031***
20-29 years	-.031***
30-39 years	-.034***
40-59 years	-.036***
60+ years	-.025**
Gender	
Female	-.041***
Male	-.016***
Income or expenditure quintile	
1st (poorest)	.025**
2nd	.031**
3rd	-.021*
4th	-.031***
5th (richest)	-.044***
Location	
Rural	-.022***
Urban	-.006

*p<0.05, **p<0.01, ***p<0.001

C.6.3 Provincial comparison

The table below provides national geographical comparisons in literacy rates. For instance in 2013/14 the literacy rate is highest in Punjab at 62.4% in comparison to the national average of 58.8%, when accounting for population weights.

Annex Table 44 PSLM: Literacy rate by province

	2012/13		2013/14		2014/15		2015/16		2018/19	
	#	%	#	%	#	%	#	%	#	%
Punjab	34666752	62.6	41984429	62.4	42522089	62.8	42387865	62.5	54360079	65.4
KPK	7068038	52.5	8585329	53.5	8493261	52.8	8436320	52.8	13697074	55.2
Sindh	13701778	60.2	16489435	56.2	17908609	59.7	16770543	55.4	20365900	57.8
Balochistan	1957966	43.9	2583193	44.1	2425860	44.4	2254371	40.9	3478369	40.3
Total	57394533	59.8	69642386	58.8	71349819	59.8	69849099	58.4	91901421	60.6

The table below captures the difference between Punjab and other provinces in Pakistan on the literacy rate. Stars have used to depict statistical significance.

Annex Table 45 PSLM: Literacy rate significance by province

Literacy	2012/13	2013/14	2014/15	2015/16	2018/19
diff. (Punjab) – (KP)	.101***	.089***	.100***	.097***	.102***
diff. (Punjab) – (Sindh)	.024***	.062***	.031***	.071***	.076***
diff. (Punjab) – (Balochistan)	.187***	.183***	.184***	.216***	.251***

*p<0.05, **p<0.01, ***p<0.001

Annex D Education Indicators in the PSES (Nielsen Survey)

D.1 Indicators and disaggregation

This document presents education indicators that have been derived from the Nielsen (PSES) dataset. Nine rounds of surveys have been conducted between 2011 and 2017 as shown below.

Annex Table 46 Nielsen: Dates of waves

Wave	Date conducted
1	November 2011
2	June 2012
3	November 2012
4	June 2013
5	November 2013
6	November - December 2014
7	June - July 2015
8	December 2015
9	January - March 2017

As identified in the DQA exercise, a number of variables are available to better understand the variation in education indicators. The following variables have been selected for this analysis:

D.1.1 Demographic variables

Age group and their corresponding class levels are shown in the table below. These cut-offs are used by the Academy of Educational Planning and Management (AEPAM) under the Ministry of Federal Education & Professional Training. AEPAM combines the EMIS datasets and publishes national education statistics.

Annex Table 47 Nielsen: Age groups and class levels

Age group	Class level
5-9 years	Primary: Classes 1-5
10-12 years	Middle: Classes 6-8
13-16 years	Secondary: Classes 9-Intermediate

Along with age, gender disaggregation is also available in the dataset. Furthermore, it is important to note that all the statistics are calculated for the 5 to 16 years age bracket.

D.1.2 Disability

Disability disaggregation is available from Wave 6 onwards. The Nielsen survey asked what kind of disability a child in the household is experiencing (accidental versus genetic/by birth). This has been

used as a proxy for disability as those that have not answered this question have been categorized as having no disability.

In Wave 9, the survey has an extensive child health and functioning module similar to ASER. For our purposes, we have combined these into broader categories as shown below. A child is categorized as having disability if they are not able to complete tasks in at least one of the following categories: seeing, hearing, walking, self-care, being understood, learning, remembering, behaviour, focus, accepting change and making friends on a four point scale.

Annex Table 48 Nielsen: Disability categorization

Data analysis categories	Nielsen categories
No disability	1 – no difficulty
	2 – some difficulty
	3 – a lot of difficulty
Disability	4 – cannot do X at all

D.1.3 School type

The Nielsen survey recorded detailed information on type of school. For our purposes we have combined these into broader categories, as shown below.

Annex Table 49 Nielsen: School categories

Data analysis categories	Nielsen categories
Government	Public
	Public school for special children
Private	Private
	Private school for special children
Madrasah	Madrasah aalim
	Madrasah hafiz

D.1.4 Income/wealth

The Nielsen survey gathers data on total estimated household income in the last month in pre-defined categories. These categories are arbitrary and hinder a division of the household by quintiles, in line with other data sets analysed in RESP. Instead of income information, Wave 9 collected detailed information on household assets. There was a lack of variation in this index and it could not be converted into wealth quintiles in line with other analysis. Due to the lack of consistent data collection and missing data, wealth disaggregation in not in this analysis.

D.1.5 Geographical variables

To understand spatial variation, urban/rural categorical variables are also included in this analysis.

D.2 Participation

The participation rate measures how many people are currently attending school for at least 4-5 hours a day in comparison to the remaining population. This also includes people who are going to a madrasah or religious institution.

PR = [children aged 5-16 who are current attending school] / [children aged 5-16 who are currently attending school + children aged 5-15 who are currently not attending school]

D.2.1 Overall participation tables

The table below provides the overall participation rate in the population and over various groups. According to wave 1, the participation rate is 78.6% among children aged 5-16 years. Moreover, 75% of girls are participating in schools in wave 1.

Column percentage are provided for the school type disaggregation as that information is only available for school-going children. For example, out of the children that are participating, 61.6% go to government schools in wave 1.

Annex Table 50 Nielsen: Overall participation rate

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5		Wave 6		Wave7		Wave 8		Wave 9	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	74891	78.6	75395	80.8	73627	80.7	71726	80.2	72669	83.0	74547	85.0	75768	85.8	72378	86.6	62700	85.5
Age group (years)																		
5-9	36783	84.1	36079	85.4	36784	85.5	35018	84.4	36613	87.6	36832	89.4	37440	90.2	36188	90.4	29953	90.5
10-12	20713	84.0	20521	85.0	19859	84.6	19173	84.0	19166	86.2	19671	88.3	19646	88.8	18864	89.7	16850	88.3
13-16	17395	64.7	18795	69.9	16984	68.8	17535	69.9	16890	71.6	18044	74.5	18682	75.8	17326	77.0	15897	75.1
Gender																		
Female	34326	75.0	34292	77.9	34290	77.9	32662	77.1	33919	80.6	35091	83.0	35671	83.8	34419	84.9	29389	83.6
Male	40565	81.9	41103	83.5	39337	83.4	39064	83.1	38750	85.1	39456	86.9	40097	87.7	37959	88.2	33311	87.2
Disability																		
No											74508	85.5	75718	86.4	72320	87.1	61943	85.9
Yes											39	7.0	50	7.6	58	10.4	757	61.3
Location																		
Rural	55320	76.0	55956	78.4	54512	78.2	52900	77.6	53871	80.9	54975	83.2	56426	84.2	53639	85.0	39223	82.3
Urban	19571	87.1	19439	88.8	19115	89.0	18826	88.7	18798	89.5	19572	90.6	19342	91.0	18739	91.5	23477	91.4
Share by school type																		
Govt.	46098	61.6	46787	62.1	46073	61.9	44872	61.8	44711	61.5	44618	59.9	45938	60.6	43970	60.8	34753	55.4
Pvt.	1200	36.8	26949	35.7	26274	35.3	25491	35.1	26099	35.9	28014	37.6	27794	36.7	26878	37.1	25913	41.3
Mad.	27593	1.6	1659	2.2	2130	2.9	2245	3.1	1859	2.6	1915	2.6	2036	2.7	1530	2.1	2034	3.2

D.2.2 Group-wise significance

The table below shows the difference in participation rates over various groups – age, gender, disability and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 51 Nielsen: Participation rate, group-wise significance

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Age group									
diff. (5-9 yrs) - (10-12 yrs)	0.001	0.004	0.009**	0.005	0.014***	0.011***	0.014***	0.007**	0.022***
diff. (5-9 yrs) - (13-16 yrs)	0.193***	0.155***	0.167***	0.145***	0.160***	0.148***	0.144***	0.134***	0.154***
diff. (10-12 yrs) - (13-16yrs)	0.192***	0.151***	0.158***	0.140***	0.146***	0.138***	0.130***	0.127***	0.132***
Gender									
diff. (Female) - (Male)	-0.069***	-0.056***	-0.055***	-0.060***	-0.045***	-0.039***	-0.039***	-0.033***	-0.036***
Disability									
diff. (No disability) - (Disability)						0.785***	0.788***	0.767***	0.246***
Location									
diff. (Rural) - (Urban)	-0.112***	-0.103***	-0.108***	-0.111***	-0.086***	-0.074***	-0.068***	-0.064***	-0.091***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in participation rates over the earliest and latest rounds, and other various groups.

Annex Table 52 Nielsen: Participation rate, significance over time

	diff. (Wave 1)-(Wave 9)
Overall	-0.069***
Age group	
5-9 years	-0.064***
10-12 years	-0.043***
13-16 years	-0.103***
Gender	
Female	-0.086***

Male	-0.053***
Location	
Rural	-0.063***
Urban	-0.043***

*p<0.05, **p<0.01, ***p<0.001

D.3 Gross enrolment ratio (GER)

The enrolment indicators have been calculated as per the formulas identified in the DQA document. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely the class the family member is enrolled in. Enrolment is not available at the madrassa school type.

The gross enrolment rate (GER) is participation in schooling by educational level. The formula for primary GER is:

Primary GER = [number of children in primary school (classes 1-5)] / [total population of children at primary age (ages 5-9)]

It is important to note here that while GER includes everyone at a certain level of education regardless of age, the Nielsen data contains educational information on children aged 1 to 16 years only. Since children above the age of 16 years are not in the sample, it can be assumed that actual GER is higher for middle and secondary schooling levels than calculated below. In wave 9, education information is only collected on children aged 4 to 16 years.

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary GER is calculated as the number of children at the primary level in government schools over the number of children at primary age. This means that the school type numbers provide the share of total GER by type of provider.

D.3.1 Overall GER

The tables below provide GERs at the primary, middle and secondary level over gender, disability and urban/rural, where these secondary variables are available in the dataset. In wave 1, for instance the primary GER for girls is 99.7% in comparison to 108.9% for boys. The school type disaggregations together add to equal the overall GER numbers. While overall primary GER is 104.5%, the government share of primary GER is 64.2% in wave 1.

Annex Table 53 Nielsen: Primary (class 1-5) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	104.5	98.1	101.3	89.0	86.9	81.5	99.9	99.3	102.2
Gender									
Female	99.7	94.7	96.9	85.0	84.0	78.7	97.0	97.0	100.0
Male	108.9	101.2	105.4	92.6	89.5	84.2	102.5	101.4	104.1
Disability									
No disability						81.9	100.5	99.9	102.9
Disability						8.2	11.3	12.1	63.1
Location									
Rural	102.4	96.6	98.4	86.6	84.8	80.8	98.7	98.1	100.3
Urban	111.9	103.7	111.6	97.4	94.1	83.7	103.8	103.4	105.8
Share of school type									
Government	64.2	62.0	64.9	56.1	54.6	50.1	61.6	61.9	58.3
Private	40.3	36.1	36.4	32.8	32.3	31.3	38.3	37.4	43.9

Annex Table 54 Nielsen: Middle (middle 6-8) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	57.9	61.2	57.4	61.8	59.2	54.5	63.8	60.9	59.8
Gender									
Female	56.0	60.6	57.3	60.5	59.4	53.2	62.4	60.7	59.8
Male	59.7	61.7	57.5	62.9	59.0	55.8	65.1	61.2	59.8
Disability									
No disability						54.8	64.3	61.2	60.1
Disability						5.5	5.7	10.8	41.5
Location									
Rural	54.3	57.3	53.3	57.7	55.5	51.5	60.7	58.1	55.1
Urban	69.4	73.4	70.5	75.0	70.6	63.5	73.6	69.7	68.3
Share of school type									

Government	39.8	41.6	39.6	43.3	40.7	36.8	43.7	41.4	37.7
Private	18.2	19.5	17.8	18.5	18.5	17.7	20.1	19.6	22.1

Annex Table 55 Nielsen: Secondary (class 9-12) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	26.1	42.5	17.9	32.1	28.2	28.4	35.1	31.5	31.3
Gender									
Female	25.0	40.3	18.0	30.4	27.9	27.8	35.1	31.7	32.4
Male	27.2	44.4	17.8	33.6	28.4	29.0	35.1	31.4	30.3
Disability									
No disability						28.6	35.4	31.8	31.5
Disability						0.6	1.0	2.6	19.9
Location									
Rural	23.0	37.8	15.5	28.4	24.3	25.5	31.9	28.7	26.0
Urban	35.3	55.7	24.6	42.0	38.9	36.6	44.2	39.3	40.4
Share of school type									
Government	17.6	28.7	11.9	21.4	18.9	18.4	24.0	20.5	18.6
Private	8.6	13.7	6.0	10.7	9.3	10.1	11.1	11.0	12.7

D.3.2 Gender disaggregation

The tables below provide gender wise GERs by primary, middle and secondary levels. The table provides enrolment statistics by urban/rural and gender. For instance in Wave 1, primary GER in urban areas is 111.3% for boys. School type disaggregations together equal the overall GER numbers for girls and boys. While the overall primary GER for boys is 108.9%, the government share of primary GER for boys is 65.1% in wave 1.

Annex Table 56 Nielsen: Male Primary (class 1-5) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Location									
Rural	108.3	100.5	103.3	90.7	87.7	83.7	101.8	100.4	103.3
Urban	111.3	103.9	113.0	99.4	96.1	85.8	105.1	104.8	105.9
Share of school type									
Government	65.1	63.1	66.6	57.4	54.8	50.3	61.6	61.1	57.6
Private	43.8	38.1	38.8	35.2	34.7	33.9	40.9	40.3	46.5

Annex Table 57 Nielsen: Female Primary (class 1-5) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Location									
Rural	96.1	92.2	93.1	82.0	81.7	77.7	95.4	95.6	97.1
Urban	112.6	103.5	110.2	95.1	92.1	81.7	102.5	101.9	105.8
Share of school type									
Government	63.3	60.7	63.0	54.7	54.3	50.0	61.6	62.7	59.0
Private	36.5	33.9	33.9	30.2	29.7	28.7	35.4	34.3	41.1

Annex Table 58 Nielsen: Male Middle (class 6-8) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Location									
Rural	57.8	59.7	55.0	60.4	56.7	53.8	63.9	60.1	57.2
Urban	65.9	68.1	65.4	71.0	66.1	61.6	69.1	64.3	64.7
Share of school type									
Government	41.5	42.6	40.2	44.7	40.6	37.6	44.1	41.4	37.1
Private	18.2	19.1	17.3	18.2	18.4	18.2	21.0	19.7	22.7

Annex Table 59 Nielsen: Female Middle (class 6-8) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Location									
Rural	50.3	54.4	51.3	54.6	54.3	48.9	57.3	55.8	52.9
Urban	73.1	79.2	76.2	79.6	75.6	65.6	78.6	75.7	72.2
Share of school type									
Government	37.9	40.5	39.0	41.7	40.8	36.0	43.2	41.3	38.4
Private	18.1	20.0	18.3	18.8	18.6	17.2	19.2	19.4	21.4

Annex Table 60 Nielsen: Male Secondary (class 9-12) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Location									
Rural	25.5	41.7	16.3	31.5	25.9	27.0	33.2	29.7	26.0
Urban	32.5	52.5	21.8	39.4	35.5	34.5	40.5	36.3	37.9
Share of school type									
Government	18.8	31.6	12.2	23.2	19.7	19.4	24.8	21.1	18.1
Private	8.4	12.8	5.6	10.4	8.7	9.6	10.3	10.4	12.2

Annex Table 61 Nielsen: Female Secondary (class 9-12) GER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	20.2	33.4	14.5	25.1	22.5	23.8	30.5	27.6	26.1
Urban	38.1	58.7	27.3	44.7	42.3	38.7	47.9	42.3	42.9
Share of school type									
Government	16.3	25.6	11.6	19.4	18.0	17.3	23.1	19.9	19.2
Private	8.7	14.8	6.4	11.0	9.9	10.6	12.0	11.7	13.2

D.4 Net enrolment ratio (NER)

The enrolment indicators have been calculated as per the formulas identified in the DQA document. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely the class the family member is enrolled in. Enrolment is not available at the madrassa school type.

Net enrolment ratio (NER) is participation in schooling by both age and educational level. The formula for primary NER:

NER = [number of children at primary age in primary school] / [total population of children at primary age]

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary NER is calculated as the number of children at the primary level, in government schools and of primary age, over the number of children at primary age. This means that the school type numbers provide the share of total NER.

D.4.1 Overall NER

The tables below provide the primary, middle and secondary NER by gender, disability and urban/rural, where these variables are present in the dataset. In wave 1, for instance, the primary NER is 65.1%. The school type disaggregations together add to equal the overall NER numbers. While overall primary NER is 65.1%, the government share of primary NER is 38.5% in wave 1.

Annex Table 62 Nielsen: Primary (class 1-5) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	65.1	60.9	57.6	54.9	50.5	49.0	63.9	59.8	61.9
Gender									
Female	63.3	60.0	56.5	53.8	50.5	48.6	63.2	59.8	62.2
Male	66.8	61.6	58.6	55.8	50.5	49.4	64.6	59.8	61.7
Disability									
No disability						49.2	64.3	60.2	62.3
Disability						1.6	4.2	4.3	39.6
Location									
Rural	64.4	60.1	57.0	53.2	49.1	48.7	62.9	59.4	60.8
Urban	67.7	63.6	60.0	60.9	55.3	50.0	67.4	61.1	64.1

Share of school type									
Government	38.5	36.9	35.7	33.1	30.4	28.9	37.7	35.6	33.3
Private	26.6	24.0	21.9	21.8	20.1	20.1	26.2	24.2	28.7

Annex Table 63 Nielsen: Middle (class 6-8) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	25.7	27.6	23.8	27.4	24.1	22.1	28.6	23.5	23.8
Gender									
Female	25.2	27.4	24.5	27.1	24.8	22.2	28.6	24.2	24.4
Male	26.1	27.7	23.1	27.7	23.5	22.0	28.7	22.9	23.2
Disability									
No disability						22.2	28.9	23.6	23.9
Disability						0.8	2.9	3.6	16.4
Location									
Rural	23.8	25.2	21.8	25.3	22.2	20.6	26.9	22.3	21.1
Urban	31.5	35.1	29.9	34.4	30.1	26.5	34.1	27.2	28.7
Share of school type									
Government	17.0	17.9	15.7	18.6	15.7	14.1	18.7	15.2	13.7
Private	8.6	9.7	8.1	8.8	8.4	8.0	9.9	8.4	10.0

Annex Table 64 Nielsen: Secondary (class 9-12) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Overall	25.3	25.9	17.1	30.9	27.2	27.4	33.7	30.4	30.4
Gender									
Female	24.1	24.7	17.2	29.3	27.0	26.7	33.7	30.3	31.5
Male	26.5	27.0	17.0	32.4	27.4	28.1	33.8	30.4	29.4
Disability									
No disability						27.6	34.0	30.6	30.6
Disability						0.6	1.0	2.6	19.3

Location									
Rural	22.1	22.9	14.7	27.4	23.4	24.5	30.5	27.5	25.3
Urban	34.6	34.6	23.7	40.6	37.8	35.3	42.8	38.2	39.3
Share of school type									
Government	17.0	17.4	11.4	20.7	18.2	17.7	23.1	19.8	18.2
Private	8.3	8.5	5.7	10.3	9.0	9.7	10.7	10.6	12.3

D.4.2 Gender disaggregation

The tables below provide gender disaggregated NERs for primary, middle and secondary levels. The table provides enrolment statistics by urban/rural and gender. In wave 1, primary NER in urban areas is 66.7% for boys. School type disaggregations together equal the overall NER numbers for girls and boys. The primary NER for boys 66.8%, the government share of primary NER for boys is 38.3% in wave 1.

Annex Table 65 Nielsen: Male Primary (class 1-5) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	66.9	61.4	58.5	54.5	49.4	49.3	64.0	59.8	61.2
Urban	66.7	62.4	58.9	60.5	54.5	49.5	66.6	59.9	62.9
Share of school type									
Government	38.3	37.0	35.7	33.1	29.7	28.3	37.3	34.4	32.3
Private	28.5	24.6	22.9	22.7	20.8	21.1	27.3	25.4	29.4

Annex Table 66 Nielsen: Female Primary (class 1-5) NER

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	61.7	58.6	55.3	51.7	48.8	48.0	61.7	59.1	60.5
Urban	68.8	64.9	61.1	61.2	56.2	50.4	68.3	62.4	65.5
Share of school type									
Government	38.7	36.8	35.7	33.0	31.1	29.5	38.1	36.9	34.3
Private	24.5	23.2	20.9	20.9	19.4	19.1	25.1	22.9	27.8

Annex Table 67 Nielsen: Male Middle (class 6-8) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	25.2	26.2	22.2	26.5	22.3	21.2	27.8	22.6	21.3
Urban	29.3	32.5	25.9	31.8	27.2	24.3	31.3	23.9	26.7
Share of school type									
Government	17.6	18.0	15.4	19.1	15.4	13.9	18.4	14.6	13.2
Private	8.5	9.7	7.7	8.6	8.2	8.1	10.2	8.3	10.0

Annex Table 68 Nielsen: Female Middle (class 6-8) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	22.3	23.9	21.4	23.8	22.1	19.9	25.9	22.0	20.8
Urban	33.8	37.9	34.3	37.5	33.4	28.9	37.2	30.9	30.9
Share of school type									
Government	16.4	17.7	16.0	18.0	16.1	14.3	19.1	15.7	14.3
Private	8.8	9.7	8.5	9.1	8.7	7.8	9.6	8.5	10.1

Annex Table 69 Nielsen: Male Secondary (class 9-12) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	24.6	25.2	15.6	30.4	25.0	26.0	31.8	28.6	25.3
Urban	32.1	32.5	21.0	38.1	34.3	33.5	39.5	35.4	36.8
Share of school type									
Government	18.3	19.0	11.7	22.5	19.0	18.8	23.8	20.4	17.6
Private	8.2	8.1	5.3	9.9	8.4	9.3	10.0	10.1	11.8

Annex Table 70 Nielsen: Female Secondary (class 9-12) NER (%)

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave7	Wave 8	Wave 9
Location									
Rural	19.4	20.3	13.8	24.2	21.7	22.9	29.2	26.3	25.3
Urban	37.1	36.7	26.3	43.1	41.3	37.2	46.2	41.0	41.8
Share of school type									
Government	15.6	15.7	11.1	18.7	17.4	16.6	22.3	19.2	18.7
Private	8.5	9.1	6.1	10.6	9.5	10.1	11.4	11.2	12.8

D.5 Drop-out rates

Since the Nielsen survey gathers cross-sectional (and not time series) data, drop-out cannot be calculated directly. Similar to the participation indicator, the drop-out rate measures the number of people that are currently not participating in an educational or religious institution but were previous participating. Those that are currently participating or those that previously did not participate are categorized as not dropping out. School type disaggregation is not available for this variable.

DR = [children aged 5-16 who previously attended school] / [children aged 5-16 who are currently attending school + children aged 5-16 who never attended school + children aged 5-16 who previously attended school]

D.5.1 Overall drop-out rates

The table below provides drop-out rates in Punjab. In wave 1, for instance, 8.9% of children aged 5-16 reported having dropped out of school. The remainder of the table provides drop-out rates over various categories.

Annex Table 71 Nielsen: Overall drop-out rates

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5		Wave 6		Wave 7		Wave 8		Wave 9	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	8526	8.9	6777	7.3	6534	7.2	4142	4.6	3390	4.0	5470	6.2	5570	6.3	5109	6.1	3293	4.6
Age group (years)																		
5-9	638	1.5	507	1.2	576	1.3	305	0.7	200	0.5	502	1.2	485	1.2	510	1.3	203	0.6
10-12	1683	6.8	1360	5.6	1434	6.1	814	3.6	646	3.0	1128	5.1	1147	5.2	1075	5.1	667	3.5

13-16	6205	23.1	4910	18.3	4524	18.3	3023	12.1	2544	11.5	3840	15.9	3938	16.0	3524	15.7	2423	11.9
Gender																		
Female	4435	9.7	3462	7.9	3345	7.6	2158	5.1	1753	4.3	2866	6.8	2875	6.8	2699	6.7	1606	4.7
Male	4091	8.3	3315	6.7	3189	6.8	1984	4.2	1637	3.7	2604	5.7	2695	5.9	2410	5.6	1687	4.5
Disability																		
No											5424	6.2	5527	6.3	5087	6.1	3233	4.6
Yes											46	8.2	43	6.6	22	3.9	60	5
Location																		
Rural	6873	9.4	5405	7.6	5328	7.6	3406	5.0	2679	4.1	4456	6.7	4557	6.8	4180	6.6	2472	5.3
Urban	1653	7.4	1372	6.3	1206	5.6	736	3.5	711	3.5	1014	4.7	1013	4.8	929	4.5	821	3.3

D.5.2 Group wise significance

The table below shows the difference in drop-out rates over various groups – age, gender, disability, income and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 72 Nielsen: Drop-out rate, group-wise significance

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8	Wave 9
Age group									
diff. (5-9 yrs) - (10-12 yrs)	-0.054***	-0.044***	-0.048***	-0.029***	-0.025***	-0.038***	-0.040***	-0.038***	-0.029***
diff. (5-9 yrs) - (13-16 yrs)	-0.216***	-0.171***	-0.170***	-0.120***	-0.111***	-0.146***	-0.148***	-0.144***	-0.113***
diff. (10-12 yrs) - (13-16yrs)	-0.163***	-0.126***	-0.122***	-0.091***	-0.086***	-0.108***	-0.108***	-0.105***	-0.084***
Gender									
diff (Female) - (Male)	0.014***	0.011***	0.008***	0.009***	0.006***	0.010***	0.009***	0.011***	0.002
Disability									
diff (No disability) - (Disability)						-0.02	-0.003	0.022*	-0.004
Location									
diff (Rural) - (Urban)	0.021***	0.013***	0.020***	0.015***	0.007***	0.020***	0.020***	0.021***	0.020***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in drop-out rates over the earliest and latest rounds, and other various groups.

Annex Table 73 Nielsen: Drop-out rate, significance over time

	diff. (Wave 1)-(Wave 9)
Overall	0.044***
Age group	
5-9 years	0.008***
10-12 years	0.033***
13-16 years	0.112***
Gender	
Female	0.050***
Male	0.038***
Location	
Rural	0.042***
Urban	0.041***

*p<0.05, **p<0.01, ***p<0.001

Additional indicators

According to the DQA source sheet on the Nielsen survey, indicators around teacher quality and the school environment could also be calculated. Specifically the survey included questions such as “If the quality of the quality of the local schools were better would you send _____ to school?” Some of the waves also included additional information on how happy respondents were with performance of school administration and teachers. However, looking through the raw datasets we found that the number of observations on this variable are only around 5-6% of the sample so the answers will not be useful. Additionally, there is string variable data on reasons why children are either not going or have dropped out from school but that requires a qualitative analysis. Furthermore, there is also information on distance, in time, to the nearest school.

Annex E Education Indicators in ASER

E.1 Indicators and disaggregation

This document presents education indicators that have been derived from the ASER dataset for the Punjab province. Indicators have also been derived for all provinces of Pakistan to provide a regional comparison with Punjab. Since the ASER survey gathers information at both the household and school level, indicators have been developed depending on the type of survey. We have raw data from 2012 to 2019 (no data was collected in 2017).

Annex Table 74 ASER: List of indicators

Household level dataset	School level dataset
Participation	Student attendance
Enrolment/attendance [gross and net]	Teacher attendance
Drop-out	Teacher qualifications
Learning levels [Reading, English and Mathematics]	School environment [facilities in school]

E.1.1 Levels of disaggregation

As identified in the DQA exercise, a number of variables are available to better understand the variation in education indicators. The following variables have been selected for this analysis:

E.1.1.1 Household level dataset

Demographic variables

Age group and their corresponding class levels are shown in the table below. These cut-offs are used by the Academy of Educational Planning and Management (AEPAM) under the Ministry of Federal Education & Professional Training. AEPAM combines the EMIS datasets and publishes national education statistics.

Annex Table 75 ASER: Age group and class levels

Age group	Class level
3-4 years	Pre-primary: *katchi*, ECE, playgroup, etc.
5-9 years	Primary: Classes 1-5
10-12 years	Middle: Classes 6-8
13-16 years	Secondary: Classes 9-12

It is important to note that all the statistics are calculated for the 5 to 16 years age bracket (with the exception of pre-primary enrolment statistics for the 3-4 age group). Along with age, gender disaggregation is also available in the dataset.

Disability

Furthermore, information on disability is available in 2015, 2016 and 2018. The health and functioning sheet of the ASER survey gathers child data on seeing, hearing, walking, self-care,

understanding and remembering on a four point scale. For our purposes, we have combined these into broader categories as shown below. A child is categorized as having disability only if they are not able to complete tasks in at least one of the following categories: seeing, hearing, walking, self-care, understanding or remembering. Also in 2015, the disability survey was only carried out in rural areas so disability related statistics are not reflective of urban areas in 2015.

Annex Table 76 ASER: Disability categories

Data Analysis Categories	ASER Categories
No disability	1 – no difficulty
Mild to moderate disability	2 – some difficulty
	3 – a lot of difficulty
Severe disability	4 – cannot do X at all

Instead of conducting the health and functioning in the household survey, the 2019 round of ASER introduced disability specific questions in the school survey – namely, presence of disability friendly facilities in schools.

School type

The ASER survey provides detailed information on type of school. The categories for school type are government school, private school, madrassa and other (including non-formal basic education facilities).

Wealth Index

To understand inequality in education levels, household wealth index quintiles have been utilized as a proxy for poverty. The wealth index has been calculated using information on house type, house ownership, along with presence of electricity connection, mobile and television[56]. While each subsequent round of ASER gathers more information about household assets, the indicators used to calculate the wealth index remain constant according to the 2012 base survey[57]. The wealth index has been divided into quintiles, with '1' representing the poorest quintile and '5' representing the richest quintile.

Geographical variables

To understand spatial variation, urban/rural and provincial categorical variables are also included in this analysis. ASER is primarily an exercise to gather rural data, along with data on a few selected urban areas. Thus, the urban/rural segregated variables do not provide an adequate comparison between these areas but can be understood to separate the urban effects. The list of urban centres covered in ASER by year are shown below.

[56] The wealth index will be missing if the household has missing information on any one of these variables.
[57] While ASER 2012 also gathers information on household toilet availability, this is not included in the wealth index because subsequent rounds do not collect this information.

Annex Table 77 ASER: Sampled urban centres in each round

2012	2013	2014	2015	2016	2018	2019
Lahore Multan	Lahore Multan Rahim Yar Khan Faisalabad	Lahore Multan Rahim Yar Khan Faisalabad Bahawalpur Gujranwala Rawalpindi	Lahore Multan Rahim Yar Khan Faisalabad Bahawalpur Gujranwala Rawalpindi	No urban districts were surveyed this year.	Data on urban districts has not been shared online.	Lahore Multan Rahim Yar Khan Faisalabad Bahawalpur Gujranwala Rawalpindi

E.1.1.2 School level dataset

While the ASER household survey data is representative at the district level that is not the case for the school survey data. Enumerators are only required to survey one government school, and an optional private school, per village surveyed. Further information on this can be found in the DQA documents. The levels of disaggregation of the school level variables are:

School Type

The ASER survey provided detailed information on type of school. The categories for school type are government school, and private school. The categories for school level are primary (class 1-5), secondary (class 1-8) and high (class 1-10). The primary category also includes *katchi*/ECE in ASER 2019. The categories for school gender are mixed, girls or boys school.

Geographical variables

To understand spatial variation, urban/rural and provincial categorical variables are also included in this analysis. ASER is primarily an exercise to gather rural data, along with a few selected urban areas, as shown above.

This annex is organized as follows – under each indicators there are several type of tables. First, overall tables provide the indicator across selected and available secondary variables (i.e. participation rate by gender). Second, results of group wise significance t-tests (i.e. difference between participation rate for girls and boys) are presented. These tables contained the difference between the two means and starts are used to denote statistical significance. A comparison of indicators in the earliest and latest round is also presented where available. Third, there are gender wise statistics by school type, wealth quintiles and urban/rural (i.e. enrolment rate for girls in government schools) for selected indicators. Lastly, there are provincial comparison tables, followed by results of provincial t-tests.

E.2 Participation

The participation rate measures how many children report they are currently attending school, in comparison to the remaining population. This variable has been calculated from the educational status question in the dataset which records whether a child has never enrolled, dropped out or is currently enrolled.

PR = [children 5-16 years who are current enrolled] / [all children aged 5-16 years]

…where all children includes those that currently enrolled in school, those who never enrolled in school and those that previously attended school.

E.2.1 Overall participation

This table provide overall participation rates and by age, gender, disability, school type, wealth quintiles and urban/rural. For instance, in 2012 83.7% of the children aged 5-16 years are currently enrolled in schools. The remainder of the table provides participation rate over various categories. For instance, in 2012, 80.1% of girls aged 5-16 years are currently enrolled in school.

Moreover, column percentages have been calculated under the school type category as that information is only available for school-going children. This means that in 2012, of the children that are participating in schools, 65.9% go to government schools.

Annex Table 78 ASER: Overall participation rate

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	44463	83.7	46296	84.6	46310	85.8	48213	85.0	43894	85.8	43586	88.8	50637	92
Age group														
5-9 years	21980	87.6	22819	88.8	22190	89.4	23935	89.2	21997	89.2	21842	92	24284	94.2
10-12 years	12298	87.0	12565	87.0	12675	88.6	12964	87.5	12035	89.5	11827	91	14560	94.3
13-16 years	10185	73.3	10912	74.8	11445	76.9	11314	75.2	9862	75.6	9917	80.4	11793	85.4
Gender														
Female	18311	80.1	19491	81.9	19652	83.4	20099	82.2	18873	83.4	18980	87.5	22462	91.2
Male	26152	86.4	26805	86.7	26658	87.6	28114	87.2	25021	87.7	24606	89.9	28142	92.8
Disability														
None							34386	85	41622	85.9	41957	89		
Mild to moderate							1618	84.7	1074	86.9	1024	89.4		
Severe							99	63.9	254	83	140	80.5		
Wealth index quintile														
1st (poorest)	2114	63.8	1660	58.4	1944	63.9	1925	66.1	6034	72.7	1682	79.8	1359	81.4
2nd	7082	75.4	2602	71.9	6385	77.2	4248	76.6	6838	82.8	3514	84.7	4990	88.1
3rd	4186	78.9	6547	80.1	2939	78.6	6389	82.1	10642	88.8	4788	86	3197	89.9
4th	15726	87.1	14345	86.5	14092	86.4	13338	86.7	4004	87.2	13816	89.9	18204	92.4
5th (richest)	13842	91.3	18094	91.9	20074	92.9	19562	90.0	14850	91.2	15806	92.8	16815	95.4
Location														
Rural	42900	83.5	43360	84.1	40463	85.0	42872	84.3					40590	91
Urban	1563	91.2	2936	93.3	5847	91.6	5341	91.3					10047	96.4
Share of school type														
Government	29287	65.9	28684	62	27087	58.5	29613	61.4	28744	65.7	31499	72.4	30073	62.1
Private	14034	31.6	16388	35.4	18021	38.9	17283	35.8	13817	31.6	11174	25.7	17616	36.4
Madrassa	674	1.5	604	1.3	619	1.3	684	1.4	609	1.4	420	1	387	0.8
Other	468	1.1	620	1.3	583	1.3	633	1.3	574	1.3	403	0.9	318	0.7

E.2.2 Group wise significance

The table below shows the difference in participation rates over various groups – age, gender, disability, wealth and location. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 79 ASER: Participation rate, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
Age group							
diff. (5-9 yrs)-(10-12 yrs)	0.006	0.018***	0.008*	0.017***	-0.003	0.010**	-0.001
diff. (5-9 yrs)-(13-16 yrs)	0.144***	0.140***	0.125***	0.140***	0.136***	0.116***	0.088***
diff. (10-12 yrs)-(13-16yrs)	0.138***	0.121***	0.117***	0.123***	0.139***	0.106***	0.089***
Gender							
diff. (Female)-(Male)	-0.063***	-0.049***	-0.042***	-0.049***	-0.043***	-0.024***	-0.016***
Disability							
diff. (None)-(Mild to moderate)				0.003	-0.01	-0.005	
diff. (None)-(Severe)				0.211***	0.029	0.085***	
diff. (Mild to moderate)-(Severe)				0.208***	0.039	0.090***	
Wealth index quintile							
diff. (1)-(2)	-0.117***	-0.137***	-0.134***	-0.105***	-0.100***	-0.048***	-0.067***
diff. (1)-(3)	-0.152***	-0.218***	-0.144***	-0.160***	-0.161***	-0.061***	-0.085***
diff. (1)-(4)	-0.235***	-0.283***	-0.224***	-0.206***	-0.145***	-0.100***	-0.110***
diff. (1)-(5)	-0.276***	-0.336***	-0.289***	-0.239***	-0.185***	-0.130***	-0.140***
diff. (2)-(3)	-0.035***	-0.082***	-0.01	-0.054***	-0.061***	-0.013	-0.018**
diff. (2)-(4)	-0.118***	-0.146***	-0.091***	-0.101***	-0.045***	-0.052***	-0.043***
diff. (2)-(5)	-0.159***	-0.200***	-0.155***	-0.134***	-0.085***	-0.082***	-0.074***
diff. (3)-(4)	-0.083***	-0.064***	-0.080***	-0.047***	0.016**	-0.039***	-0.025***
diff. (3)-(5)	-0.124***	-0.118***	-0.145***	-0.079***	-0.024***	-0.069***	-0.056***
diff. (4)-(5)	-0.041***	-0.054***	-0.065***	-0.033***	-0.040***	-0.030***	-0.030***
Location							
diff. (Rural) – (Urban)	-0.077***	-0.092***	-0.066***	-0.070***			-0.054***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in participation rates over the earliest and latest rounds, and other various groups.

Annex Table 80 ASER: Participation rate, significance over time

	diff. (2012)-(2019)
Overall	-0.083***
Age group	
5-9 years	-0.066***
10-12 years	-0.072***
13-16 years	-0.121***
Gender	
Female	-0.111***
Male	-0.063***
Wealth index quintile	
1st (poorest)	-0.177***
2nd	-0.127***
3rd	-0.110***
4th	-0.053***
5th (richest)	-0.041***
Location	
Rural	-0.075***
Urban	-0.052***

*p<0.05, **p<0.01, ***p<0.001

E.2.3 Provincial comparison

This section provides national geographical comparisons in participation rates. For instance in 2012, the participation rate is highest in ICT at 93% in comparison to the national average of 76%.

Annex Table 81 ASER: Participation rate by province

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	12126	91.7	13958	94.4	12055	93.3	14419	95.3	15152	95.5	12930	94.4	13289	96.9
Balochistan	31364	63.8	30267	63.6	35506	66.6	38616	68.9	31756	62.6	39182	70.1	38609	71.0
FATA	11194	73.0	12264	77.4	12190	78.0	14786	77.9	12350	83.2	12655	69.9	13347	70.3
Gilgit-Baltistan	9307	82.1	10145	81.7	10126	83.9	9190	83.0	9630	85.7	12906	89.2	20052	91.1
Islamabad	1100	93.0	1328	92.9	1638	99.5	1101	97.8	535	93.0	1076	90.6	1503	95.9
KPK	29917	82.2	35108	85.2	35724	84.0	34595	86.4	29217	84.0	29283	84.1	30568	84.2
Punjab	44463	83.7	46296	84.6	46310	85.8	48213	85.0	43894	85.8	43586	88.8	50637	92.0
Sindh	24819	68.3	31272	73.7	37088	77.1	35176	77.5	28688	77.2	26818	85.1	35575	87.9
Total	164290	76.0	180638	78.4	190637	79.4	196096	80.2	171222	79.1	178436	81.6	203580	84.0

The table below captures the difference between Punjab and other provinces in Pakistan on the participation rate. Stars have used to depict statistical significance.

Annex Table 82 ASER: Participation rate, significance by province/region

	2012	2013	2014	2015	2016	2018	2019
diff. (Punjab)-(Sindh)	0.154***	0.109***	0.086***	0.075***	0.086***	0.038***	0.042***
diff. (Punjab)-(Balochistan)	0.200***	0.210***	0.191***	0.161***	0.232***	0.187***	0.210***
diff. (Punjab)-(KP)	0.016***	-0.006**	0.017***	-0.013***	0.018***	0.047***	0.078***
diff. (Punjab)-(GB)	0.016***	0.029***	0.018***	0.020***	0.001	-0.004	0.009***
diff. (Punjab)-(AJK)	-0.080***	-0.098***	-0.075***	-0.102***	-0.097***	-0.056***	-0.048***
diff. (Punjab)-(Islamabad)	-0.093***	-0.082***	-0.138***	-0.127***	-0.072***	-0.017	-0.038***
diff. (Punjab)-(FATA)	0.107***	0.072***	0.078***	0.071***	0.026***	0.189***	0.217***

*p<0.05, **p<0.01, ***p<0.001

E.3 Gross enrolment ratio (GER)

The enrolment/attendance indicators have been calculated as per the formulas identified in the DQA document. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely the current class the child is enrolled in (participation indicator looks at broader school attendance irrespective of class levels).

The gross enrolment ratio (GER) is participation in schooling by educational level. The formula for primary GER is:

GER = [number of children in primary school (classes 1-5)] / [total population of children at primary age (ages 5-9)]

It is important to note here that while GER includes everyone at a certain level of education regardless of age, the ASER survey records information on children aged 3 to 16 years only. Since children above the age of 16 years are not in the sample, it can be assumed that actual GER is higher for middle and secondary schooling levels than calculated below.

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary GER is calculated as the number of children at the primary level in government schools over the number of children at primary age. This means that the school type numbers provide the share of total GER.

E.3.1 Overall gross enrolment ratio (GER)

The tables below show GERs by primary, middle and secondary over certain categories. For instance, in 2012 the overall primary GER is 106.1%. The remaining percentages are absolute values in that they provide GERs for specific groups. Primary GER in rural areas is 105.8% in comparison to 116.6% in urban areas in 2012.

The school type disaggregations provide the share by service provider. While overall primary GER is 106.1%, the government share of primary GER is 69.2% in 2012.

Annex Table 83 ASER: Primary (Class 1-5) GER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	106.1	106.3	110.8	111.2	106.2	109.0	111.1
Gender							
Male	111.2	110.3	115.6	114.1	109.7	111.0	111.8
Female	99.8	101.4	105.1	107.4	102.0	106.6	110.3
Disability							
None				112.0	106.5	109.6	
Mild to moderate				101.3	104.0	100.9	
Severe				77.2	103.1	73.8	
Wealth index quintiles							
1st (poorest)	82.6	73.3	83.3	91.1	93.5	99.0	100.7
2nd	98.8	94.8	103.9	103.3	105.0	107.9	107.0
3rd	102.3	105.5	107.5	106.1	111.4	106.6	109.8
4th	111.8	110.2	116.2	114.7	107.6	108.8	112.5
5th (richest)	113.0	111.2	115.0	116.2	108.6	112.7	115.4
Location							
Rural	105.8	106.1	110.2	110.9			109.3
Urban	116.6	109.3	114.9	113.6			119.1
Share of school type							
Government	69.2	64.3	66.4	69.2	70.8	78.7	71.8
Private	34.4	39.3	42.0	39.4	32.5	28.4	37.6
Madrassa	1.2	1.0	0.9	0.9	0.9	0.6	0.7
Other	1.3	1.6	1.5	1.7	1.6	1.2	1.0

Annex Table 84 ASER: Middle (Class 6-8) GER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	65.9	67.7	71.6	65.9	67.0	63.8	70.1
Gender							
Male	67.5	69.9	74.2	68.4	68.1	66.0	71.9
Female	63.7	64.7	68.2	62.6	65.6	61.0	67.8
Disability							
None				65.2	66.9	63.8	
Mild to moderate				62.8	80.2	57.8	
Severe				71.4	65.4	105.7	
Wealth index quintiles							
1st (poorest)	34.1	30.3	40.6	36.9	44.4	45.6	47.7
2nd	50.6	47.1	57.8	45.3	60.9	51.4	68.1
3rd	55.0	53.1	59.2	59.7	70.0	60.2	62.6
4th	69.4	71.0	70.7	67.0	67.9	67.8	73.1
5th (richest)	81.9	81.1	83.8	77.1	78.7	70.5	74.6
Location							
Rural	65.8	67.2	70.4	63.7			69.6
Urban	70.5	75.2	80.2	84.6			71.9
Share of school type							
Government	47.2	47.0	47.8	42.8	47.2	49.4	48.7
Private	17.9	19.8	22.7	22.3	18.6	13.6	20.4
Madrassa	0.5	0.4	0.4	0.4	0.6	0.5	0.6
Other	0.4	0.4	0.7	0.4	0.4	0.2	0.3

Annex Table 85 ASER: Secondary (Class 9-12) GER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	31.5	35.3	35.1	33.3	34.3	34.1	40.4
Gender							
Male	32.8	36.8	36.3	34.8	35.7	34.6	42.0
Female	29.8	33.3	33.4	31.2	32.4	33.4	38.6
Disability							
None				33.2	34.2	34.4	
Mild to moderate				31.9	33.9	25.6	
Severe				14.7	26.2	37.3	
Wealth index quintiles							
1st (poorest)	12.2	14.1	15.7	13.7	18.1	17.1	24.0
2nd	20.7	21.4	22.8	22.0	27.0	23.7	34.4
3rd	24.2	27.9	26.0	28.5	35.3	28.4	36.7
4th	34.5	35.2	33.5	34.5	36.3	35.7	38.3
5th (richest)	39.6	44.4	44.5	38.9	43.2	40.2	47.9
Location							
Rural	31.2	34.7	33.7	32.1			36.4
Urban	41.6	44.5	45.1	41.9			57.4
Share of school type							
Government	22.8	25.0	23.9	22.2	24.6	26.3	25.3
Private	8.6	10.0	10.7	10.7	9.2	7.4	14.3
Madrassa	0.1	0.2	0.2	0.2	0.3	0.2	0.7
Other	0.1	0.1	0.3	0.1	0.1	0.2	0.2

E.3.2 Gender disaggregation

The tables below provide gender disaggregated GERs for primary, middle and secondary levels. The table provides enrolment statistics by expenditure and urban/rural, and gender. For instance in 2012, primary GER in urban areas is 119.7% among boys and 113.4% among girls.

School type disaggregations together equal the overall GER number for girls and boys. While overall primary GER for boys is 111.2%, the government share of primary GER for boys is 72.9% in 2012.

Annex Table 86 ASER: Primary GER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Wealth index quintiles														
1st	93.3	67.6	80.3	63.2	90.9	73.1	96.6	84.3	100.5	85.3	102.9	94.1	101.1	100.0
2nd	106.4	89.1	100.0	87.5	110.9	94.8	107.5	97.9	107.6	101.7	112.6	102.3	108.3	105.1
3rd	108.6	94.4	110.8	99.1	113.1	100.8	110.0	101.1	115.2	106.9	108.9	103.7	111.9	107.0
4th	116.7	106.0	115.1	104.6	121.5	110.1	117.4	111.4	111.5	102.9	111.4	105.7	112.9	112.0
5th	114.9	110.4	113.5	108.5	118.5	110.9	118.2	113.6	110.3	106.5	112.5	112.9	116.2	114.5
Location														
Rural	110.9	99.3	110.3	100.9	115.2	104.3	114.2	106.8					110.0	108.5
Urban	119.7	113.4	110.1	108.5	118.5	110.9	113.9	113.2					120.0	117.9
Share of school type														
Govt.	72.9	64.7	66.7	61.3	68.6	63.7	71.4	66.4	73.0	68.3	80.3	76.9	72.6	70.8
Private	35.9	32.4	41.1	37.1	44.4	39.1	40.3	38.4	33.8	30.9	28.7	27.9	37.5	37.8
Madrassa	1.2	1.2	1.2	0.9	1.1	0.7	1.0	0.8	1.0	0.8	0.7	0.4	0.8	0.7
Other	1.2	1.5	1.3	2.0	1.5	1.6	1.5	1.8	1.6	1.7	1.2	1.2	0.9	1.0

Annex Table 87 ASER: Middle GER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Wealth index quintiles														
1st (poorest)	40.1	24.7	34.8	23.9	48.3	29.5	46.2	24.5	50.5	35.6	49.5	40.3	49.8	45.5
2nd	53.7	46.1	51.1	41.3	63.5	49.7	52.3	36.3	64.4	56.3	51.8	50.9	65.6	71.3
3rd	54.6	55.6	55.4	50.0	64.7	51.3	64.3	53.6	70.4	69.5	63.9	55.2	65.4	59.1
4th	70.7	67.7	74.2	66.5	72.9	67.7	69.2	63.9	69.1	66.1	69.8	65.4	76.2	69.5
5th (richest)	83.3	79.9	82.9	78.7	84.0	83.6	77.2	77.1	77.3	80.4	73.5	66.9	76.5	72.1
Location														
Rural	67.4	63.4	69.6	63.8	73.4	66.3	66.8	59.5					71.2	67.7
Urban	70.1	71.1	73.9	76.9	79.9	80.6	83.0	86.6					74.8	68.5
Share of school type														
Government	49.3	44.1	49.3	43.9	49.6	45.3	45.4	39.3	48.3	45.9	51.2	47.2	50.1	46.9
Private	17.4	18.6	19.7	20.0	23.3	21.8	22.2	22.4	18.7	18.5	14.0	13.1	20.8	19.9
Madrassa	0.4	0.6	0.4	0.3	0.5	0.4	0.4	0.4	0.5	0.7	0.5	0.4	0.6	0.7
Other	0.3	0.4	0.4	0.4	0.8	0.6	0.4	0.4	0.4	0.4	0.2	0.3	0.3	0.4

Annex Table 88 ASER: Secondary GER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Wealth index quintiles														
1st (poorest)	15.0	8.1	16.8	9.9	18.6	11.8	15.0	11.8	21.1	14.2	19.4	14.1	24.5	23.2
2nd	24.3	15.9	24.7	16.9	25.0	19.4	25.5	17.1	29.7	23.5	26.3	20.2	35.1	33.7
3rd	27.8	19.5	29.9	25.3	29.6	21.1	29.9	26.2	37.2	32.8	29.1	27.4	37.0	36.5
4th	35.7	32.9	37.3	32.3	34.3	32.6	37.3	30.6	36.8	35.5	36.7	34.3	40.3	36.0
5th (richest)	38.7	40.9	45.3	43.2	45.2	43.5	38.9	39.0	42.9	43.5	40.2	40.2	49.4	46.2
Location														
Rural	32.6	29.3	36.3	32.4	35.3	31.4	33.9	29.5					38.4	34.0
Urban	40.2	43.7	44.3	44.7	43.3	47.5	41.6	42.3					56.8	58.2
Share of school type														
Government	24.8	20.1	27.1	22.1	25.5	21.7	24.1	19.6	26.4	22.3	27.0	25.4	26.9	23.5
Private	7.9	9.5	9.3	10.9	10.4	11.1	10.3	11.2	8.9	9.5	7.3	7.6	14.1	14.5
Madrassa	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.4	0.1	0.3	0.8	0.6
Other	0.0	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1

E.3.3 Provincial comparison

These tables provide national geographical comparison of GERs. For instance in 2012, primary GER is highest in AJK at 117.4%.

Annex Table 89 ASER: Primary (Class 1-5) GER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	106.1	106.3	110.8	111.2	106.2	109.0	111.1
KPK	99.5	103.5	100.6	104.8	94.2	87.8	94.0
Sindh	88.6	99.6	98.3	105.3	102.2	96.0	104.1
Balochistan	63.7	76.8	76.7	93.5	79.5	74.1	81.0
AJK	117.4	109.9	111.8	122.5	114.4	106.6	104.9
FATA	79.9	86.2	87.0	92.4	93.5	73.6	81.9
Gilgit-Baltistan	104.4	105.4	106.0	106.6	103.8	109.6	86.8
Islamabad – ICT	111.3	105.9	123.0	121.1	114.3	106.8	104.1

Annex Table 90 ASER: Middle (Class 6-8) GER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	65.9	67.7	71.6	65.9	67.0	63.8	70.1
KPK	67.4	70.7	68.3	72.3	68.9	58.4	53.2
Sindh	42.3	48.2	53.8	53.3	42.8	44.4	53.3
Balochistan	41.9	38.4	34.5	42.2	35.8	33.3	42.8
AJK	84.5	82.4	82.7	78.8	92.3	83.9	85.8
FATA	45.5	51.5	54.4	54.6	57.4	44.8	23.3
Gilgit-Baltistan	64.9	68.5	67.6	67.5	67.2	69.4	56.8
Islamabad – ICT	91.8	76.4	99.8	78.4	71.4	71.3	57.4

Annex Table 91 ASER: Secondary (Class 9-12) GER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	31.5	35.3	35.1	33.3	34.3	34.1	40.4
KPK	32.2	33.9	32.2	38.8	36.7	36.3	33.8
Sindh	19.5	25.7	30.1	25.0	18.9	26.8	43.9
Balochistan	13.9	15.1	14.1	13.2	12.5	9.7	18.0
AJK	36.1	43.5	40.6	46.0	53.5	45.7	43.9
FATA	20.5	26.6	28.9	25.0	29.4	22.5	17.7
Gilgit-Baltistan	28.0	27.6	28.2	30.2	36.3	34.8	37.1
Islamabad – ICT	54.4	38.0	59.8	42.7	40.3	36.0	31.5

E.4 Net enrolment ratio (NER)

Net enrolment ratio (NER) is participation in schooling by both age and educational level. The formula for primary NER is:

NER = [number of children at primary age in primary school (ages 5-9 & classes 1-5)] / [total population of children at primary age (ages 5-9)]

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary NER is calculated as the number of children at the primary level, in government schools and of primary age, over the number of children at primary age. This means that the school type numbers provide the share of total NER.

E.4.1 Overall net enrolment ratio (NER)

The tables below show NERs by primary, middle and secondary over certain categories. For instance, in 2012 the overall primary NER is 71.9%. The remaining percentages are absolute value in that they provide NERs for specific groups. For instance, primary NER for girls is 69.7% in comparison to that for boys at 73.7% in 2012.

The school type disaggregations provide the share of NER by service provider. While overall primary NER is 71.9%, the government share of primary NER is 45.8% in 2012.

Annex Table 92 ASER: Primary (Class 1-5) NER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	71.9	70.6	72.9	72.4	73.0	73.1	75.7
Gender							
Male	73.7	72	74.4	73.8	73.5	74.0	76.2
Female	69.7	68.8	71.2	70.7	72.5	72.0	75.1
Disability							
None				73.5	73.4	73.3	
Mild to moderate				68.8	72.8	70.8	
Severe				53.2	76.7	63.7	
Wealth index quintiles							
1st (poorest)	57.4	49.0	54.4	58.3	63.5	66.8	64.7
2nd	66.3	62.7	65.4	67	72.6	71.9	72.0
3rd	69.4	67.9	68.2	68.9	76.2	71.8	74.6
4th	75.1	72.0	75.3	74.8	73.4	74.4	76.7
5th (richest)	77.6	76.0	78.2	75.8	76.1	75.4	79.3
Location							
Rural	71.8	70.7	72.2	72.5			74.2
Urban	76.6	68.0	78.4	71.5			82.0
Share of school type							
Government	45.8	41.5	42.2	44.1	46.9	51.8	47.8

Private	24.6	27.4	29.3	26.8	24.3	20.1	26.8
Madrassa	0.7	0.5	0.5	0.5	0.6	0.3	0.4
Other	0.8	1.1	1	1.1	1.1	0.9	0.7

Annex Table 93 ASER: Middle (Class 6-8) NER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	31.8	33.0	35.8	31.2	34.0	29.8	36.3
Gender							
Male	32.2	33.6	36.2	31.6	34.1	30.5	37.4
Female	31.1	32.0	35.1	30.6	33.9	28.9	34.9
Disability							
None				31.3	34.0	29.8	
Mild to moderate				31.3	36.5	23.6	
Severe				42.9	34.6	68.6	
Wealth index quintiles							
1st (poorest)	14.9	15.5	19.7	18.2	21.5	22.2	22.8
2nd	22.8	22.9	26.5	22.0	30.5	23.6	31.6
3rd	27.3	24.6	27.1	29.3	35.3	27.4	32.4
4th	33.3	34.5	34.7	32.0	34.0	31.6	36.3
5th (richest)	40.6	40.4	43.5	35.7	41.1	33.2	40.6
Location							
Rural	31.8	32.9	34.5	30.4			35.5
Urban	32.6	34.1	44.6	37.8			39.5
Share of school type							
Government	22.0	22.3	23.1	19.6	23.6	23.0	24.9
Private	9.4	10.3	12.1	11.2	10	6.5	10.9
Madrassa	0.2	0.1	0.2	0.2	0.2	0.2	0.3
Other	0.2	0.2	0.3	0.2	0.2	0.1	0.2

Annex Table 94 ASER: Secondary (Class 9-12) NER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	31.0	34.0	35.1	33.3	34.3	34.1	40.4
Gender							
Male	32.2	35.4	36.3	34.8	35.7	34.6	42.0
Female	29.3	32.1	33.4	31.2	32.4	33.4	38.6
Disability							
None				33.2	34.2	34.4	
Mild to moderate				31.9	33.9	25.6	
Severe				14.7	26.2	37.3	
Wealth index quintiles							
1st (poorest)	12.1	12.7	15.7	13.7	18.1	17.1	24.0
2nd	20.3	20.0	22.8	22.0	27.0	23.7	34.4
3rd	24.0	26.9	26.0	28.5	35.3	28.4	36.7
4th	33.8	34.0	33.5	34.5	36.3	35.7	38.3
5th (richest)	39.0	42.9	44.5	38.9	43.2	40.2	47.9
Location							
Rural	30.6	33.4	33.7	32.1			36.4
Urban	40.8	43.3	45.1	41.9			57.4
Share of school type							
Government	22.4	24.2	23.9	22.2	24.6	26.3	25.3
Private	8.4	9.6	10.7	10.7	9.2	7.4	14.3
Madrassa	0.1	0.2	0.2	0.2	0.3	0.2	0.7
Other	0.1	0.1	0.3	0.1	0.1	0.2	0.2

E.4.2 Gender disaggregation

The tables below provide gender disaggregated NERs for primary, middle and secondary levels. The tables provide enrolment statistics by wealth index and urban/rural, and gender. For instance in 2012, primary NER in urban areas is 74.2% for boys and 79% for girls.

School type disaggregations together equal the overall NER number for girls and boys. While overall primary NER for girls is 69.7%, the government share of primary NER for girls is 44.2% in 2012.

Annex Table 95 ASER: Primary NER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Wealth index quintiles														
1st (poorest)	64.0	48.3	54.8	40.5	59.1	47.9	61.3	54.5	65.8	60.7	68.6	64.7	62.3	67.5
2nd	69.7	62.1	66.7	57.0	69.0	60.8	69.5	63.7	73.3	71.8	73.9	69.4	72.7	71.0
3rd	71.4	66.9	69.7	65.6	70.0	66.1	70.6	66.6	76.9	75.5	72.7	70.7	77.1	71.3
4th	75.9	74.1	73.4	70.4	76.9	73.4	75.6	73.8	73.7	73.1	75.3	73.4	77.2	76.2
5th (richest)	78.2	76.9	76.4	75.5	78.5	77.9	76.8	74.4	75.4	76.8	76.1	74.7	79.7	79.0
Location														
Rural	73.7	69.4	72.4	68.7	73.8	70.4	74.0	70.7					74.7	73.6
Urban	74.2	79.0	66.0	70.0	79.4	77.3	72.1	70.8					82.7	81.3
Share of school type														
Government	47.1	44.2	42.3	40.6	42.6	41.6	45.1	42.8	46.8	47.1	52.6	50.9	48.4	47.0
Private	25.2	23.9	28.3	26.4	30.3	28.1	27.1	26.3	24.8	23.6	20.2	19.9	26.7	26.9
Madrassa	0.6	0.7	0.6	0.5	0.5	0.4	0.5	0.4	0.6	0.5	0.3	0.3	0.5	0.4
Other	0.7	0.9	0.9	1.3	1.0	1.0	1.1	1.1	1.1	1.2	0.8	0.9	0.6	0.7

Annex Table 96 ASER: Middle NER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Wealth index quintiles														
1st (poorest)	17.5	11.0	17.4	12.8	21.9	16.6	22.4	12.6	24.9	16.7	23.0	21.2	23.0	22.7
2nd	24.4	20.5	25.3	19.6	28.5	23.7	24.9	18.2	32.6	27.6	24.3	22.8	30.7	32.7
3rd	28.7	25.1	25.8	23.0	31.1	21.3	29.6	28.9	34.3	36.7	28.4	26.1	33.1	31.5
4th	33.7	32.8	35.3	33.2	35.3	33.9	33.5	29.9	34.1	33.9	31.7	31.5	37.9	34.5
5th (richest)	40.1	41.1	40.6	40.2	42.5	44.7	34.2	37.6	39.5	43.3	34.7	31.5	41.8	39.1
Location														
Rural	32.2	31.1	33.6	31.9	35.3	33.4	31.1	29.4					36.8	33.9
Urban	33.2	31.9	34.0	34.1	42.8	46.9	35.9	40.1					39.5	39.4
Share of school type														
Government	22.8	20.9	23.2	21.0	23.5	22.6	20.3	18.8	23.7	23.5	23.7	22.1	26.1	23.5
Private	9.1	9.9	10.0	10.7	12.2	12.1	11.0	11.4	9.9	10.0	6.4	6.5	10.8	11.0
Madrassa	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.3
Other	0.2	0.2	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2

Annex Table 97 ASER: Secondary NER (%) by gender

	2012		2013		2014		2015		2016		2018		2019	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Wealth index quintiles														
1st (poorest)	14.8	8.1	15.1	9.0	18.6	11.8	15.0	11.8	21.1	14.2	19.4	14.1	24.5	23.2
2nd	23.7	15.7	23.4	15.4	25.0	19.4	25.5	17.1	29.7	23.5	26.3	20.2	35.1	33.7
3rd	27.5	19.3	28.8	24.4	29.6	21.1	29.9	26.2	37.2	32.8	29.1	27.4	37.0	36.5
4th	35.1	32.2	35.8	31.4	34.3	32.6	37.3	30.6	36.8	35.5	36.7	34.3	40.3	36.0
5th (richest)	37.9	40.6	43.8	41.7	45.2	43.5	38.9	39.0	42.9	43.5	40.2	40.2	49.4	46.2
Location														
Rural	32.0	28.9	35.0	31.3	35.3	31.4	33.9	29.5					38.4	34.0
Urban	39.5	42.6	42.9	43.8	43.3	47.5	41.6	42.3					56.8	58.2
Share of school type														
Government	24.4	19.8	26.1	21.4	25.5	21.7	24.1	19.6	26.4	22.3	27.0	25.4	26.9	23.5
Private	7.7	9.3	9.0	10.5	10.4	11.1	10.3	11.2	8.9	9.5	7.3	7.6	14.1	14.5
Madrassa	0.1	0.1	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.4	0.1	0.3	0.8	0.6
Other	0.0	0.1	0.1	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1

E.4.3 Provincial comparison

These tables provide a national provincial comparison of NERs. For instance, in 2012 primary NER is highest in ICT at 80.1%.

Annex Table 98 ASER: Primary NER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	71.9	70.6	72.9	72.4	73.0	73.1	75.7
KPK	64.7	67.4	65.8	69.8	64.8	59.3	64.3
Sindh	61.8	66.0	67.5	67.5	68.1	61.1	72.4
Balochistan	35.4	41.6	40.9	54.7	45.9	41.0	51.9
AJK	74.4	72.6	73.0	74.8	78.3	66.7	67.3
FATA	55.7	59.1	57.8	63.4	65.7	51.3	58.0
Gilgit-Baltistan	60.3	57.6	57.5	58.9	61.7	61.7	53.6
Islamabad - ICT	80.1	75.4	96.4	81.7	76.1	66.0	76.2

Annex Table 99 ASER: Middle NER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	31.8	33.0	35.8	31.2	34.0	29.8	36.3
KPK	29.0	31.2	29.0	32.6	31.8	26.2	25.0
Sindh	20.4	22.2	27.0	22.3	17.7	18.7	26.6
Balochistan	13.9	11.6	11.1	13.0	11.5	10.2	18.0
AJK	35.8	38.2	38.2	35.9	46.0	39.4	39.0
FATA	20.2	23.6	25.2	23.1	25.4	20.9	10.0
Gilgit-Baltistan	24.1	22.3	23.5	24.7	27.9	25.4	23.1
Islamabad - ICT	50.7	34.9	59.2	34.8	35.4	30.8	24.7

Annex Table 100 ASER: Secondary NER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	31.0	34.0	35.1	33.3	34.3	34.1	40.4
KPK	32.0	33.1	32.2	38.8	36.7	36.3	33.8
Sindh	19.2	24.4	30.1	25.0	18.9	26.8	43.9
Balochistan	13.9	14.4	14.1	13.2	12.5	9.7	18.0
AJK	35.7	42.1	40.6	46.0	53.5	45.7	43.9
FATA	20.4	26.0	28.9	25.0	29.4	22.5	17.7
Gilgit-Baltistan	27.8	26.9	28.2	30.2	36.3	34.8	37.1
Islamabad - ICT	52.8	36.4	59.8	42.7	40.3	36.0	31.5

E.5 Pre-primary enrolment

E.5.1 Pre-primary gross enrolment ratio (GER)

The tables below show enrolment at the pre-primary level (before class 1). This encompasses everything before class 1 and is recorded in ASER through multiple names - ECE, *kachi*, kindergarten, nursery, *paki*, playground, prep. The formula for pre-primary GER is:

GER = [all children that report being at the pre-primary level/all the children that are 3-4 years]

The table below provides GER over various categories and years. For instance, in 2012 the pre-primary GER is 80.8% for boys and 65.6% for girls.

Annex Table 101 ASER: Pre-primary GER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	73.4	75.0	76.7	68.5	76.6	67.4	72.0
Gender							
Male	80.8	79.7	79.7	74.7	81.1	70.6	73.8
Female	65.5	70.0	73.3	62.0	72.0	64.8	70.0
Disability							
None				67.9	77.3	66.9	
Mild to moderate				77.4	61.7	102.1	
Severe				33.3	60.0	50.0	
Wealth index quintile							
1st (poorest)	58.7	58.5	60.2	61.4	69.3	74.9	61.5
2nd	67.3	68.1	75.5	70.8	76.5	62.8	64.6
3rd	69.5	72.2	75.4	72.8	79.5	67.7	69.0
4th	77.2	76.4	74.7	72.3	77.6	66.7	69.5
5th (richest)	76.0	80.8	81.7	66.9	77.5	67.1	72.9
Location							
Rural	73.1	72.3	76.3	67.4			66.4
Urban	80.9	126.1	79.3	78.6			97.5
Share of school type							
Government	39.0	34.5	15.2	32.2	33.5	38.0	18.6
Private	32.7	38.1	60.1	34.1	40.8	27.8	53.3
Madrassa	0.4	0.5	0.1	0.5	0.2	0.2	0.0
Other	1.2	1.9	1.3	1.7	1.9	1.2	0.0

Annex Table 102 ASER: Pre-primary GER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	73.4	75.0	76.7	68.5	76.6	67.4	72.0
Sindh	46.7	40.4	50.0	43.9	49.5	63.4	56.1
Balochistan	70.3	52.9	83.8	40.2	50.3	80.5	60.6
KPK	61.3	77.2	70.3	62.2	60.9	57.7	63.2
Gilgit-Baltistan	77.7	86.4	88.1	68.6	74.2	76.3	73.2
AJK	70.1	102.2	87.5	94.7	44.8	85.9	123.7
ICT	70.6	87.6	61.0	66.4	93.8	99.5	86.6
FATA	60.0	63.7	70.3	44.2	65.8	31.9	35.1

E.5.2 Pre-primary net enrolment ratio (NER)

The formula for pre-primary NER is:

NER = [all children 3-4 years that report being at the pre-primary level/all the children that are 3-4 years]

The table below provides NER over various categories and years. For instance, in 2012 the pre-primary GER is 31.8% for boys and 28.4% for girls.

Annex Table 103 ASER: Pre-primary NER (%)

	2012	2013	2014	2015	2016	2018	2019
Overall	30.1	22.0	26.0	23.2	31.9	24.1	30.2
Gender							
Male	31.8	22.4	27.6	24.4	33.0	24.6	30.9
Female	28.4	21.6	24.3	22.0	30.8	23.8	29.5
Disability							
None				23.6	32.5	24.2	
Mild to moderate				23.7	26.5	28.9	
Severe				15.2	34.0	15.6	
Wealth index quintile							
1st (poorest)	23.5	11.1	16.0	19.1	26.8	22.4	24.9
2nd	26.3	18.7	23.9	19.8	29.7	22.1	20.5
3rd	30.8	19.3	22.9	22.3	33.9	22.4	26.3
4th	31.3	22.1	25.6	24.9	31.7	22.8	28.2
5th (richest)	32.9	26.1	29.8	24.8	34.2	24.8	32.6
Location							
Rural	30.0	21.4	25.6	23.1			24.5
Urban	34.2	35.0	29.4	24.5			56.1
Share of school type							
Government	16.3	10.4	6.1	11.1	14.9	13.0	9.4
Private	13.3	11.1	19.4	11.5	16.1	10.5	20.7
Madrassa	0.1	0.1	0.0	0.2	0.1	0.1	0.0
Other	0.5	0.4	0.5	0.5	0.7	0.4	0.0

Annex Table 104 ASER: Pre-primary NER (%) by province

	2012	2013	2014	2015	2016	2018	2019
Punjab	30.1	22.0	26.0	23.2	31.9	24.1	30.2
Sindh	23.0	13.6	17.6	14.1	17.3	7.4	25.2
Balochistan	8.4	5.4	9.8	8.9	9.0	11.1	15.4
KPK	15.9	16.9	13.8	15.0	17.1	9.1	14.3
Gilgit-Baltistan	27.3	19.2	21.2	16.0	24.0	17.6	29.7
AJK	26.8	26.7	21.3	17.7	9.9	24.1	37.6
ICT	41.9	27.8	54.3	26.9	37.0	43.7	52.3
FATA	11.8	13.1	13.6	8.0	13.7	4.8	5.5

E.6 Drop-out rates

Since the ASER gathers cross-sectional (and not time series) data, drop-out cannot be calculated directly. Similar to the participation indicator, the drop-out rate measures how many children have previously attended school in comparison to the remaining population. This variable has been calculated from the educational status question in the dataset which records whether a child has never enrolled, dropped out or is currently enrolled in school.

DR = [children aged 5-16 years who previously attended school] / [all children aged 5-16 years]

…where all children includes those that currently enrolled in school, those who never enrolled in school and those that previously attended school.

E.6.1 Overall drop-out rates

This table provides an overall drop-out rate and further disaggregation of this rate by age, gender, disability, wealth quintiles and urban/rural. For instance the overall drop-out rate for children aged 5-16 years is 6.6% in 2012. The remainder of the table provides drop-out rate over different categories. For instance, drop-out rate among girls is 7.4% in 2012.

Annex Table 105 ASER: Overall drop-out rate

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	3482	6.6	3385	6.2	3101	5.7	3640	6.4	2996	5.9	2419	4.9	2134	3.9
Age group														
5-9 years	341	1.4	300	1.2	322	1.3	418	1.6	298	1.2	260	1.1	325	1.3
10-12 years	847	6.0	835	5.8	682	4.8	894	6.0	668	5.0	573	4.4	427	2.8
13-16 years	2294	16.5	2250	15.4	2097	14.1	2328	15.5	2030	15.6	1586	12.9	1382	10.0
Gender														
Female	1696	7.4	1567	6.6	1450	6.2	1729	7.1	1429	6.3	1110	5.1	1047	4.3
Male	1786	5.9	1818	5.9	1651	5.4	1911	5.9	1567	5.5	1309	4.8	1067	3.5
Disability														
None							2720	6.7	2883	5.9	2289	4.9		
Mild to moderate							120	6.3	57	4.6	68	5.9		
Severe							10	6.5	21	6.9	23	13.2		
Wealth index quintile														
1st (poorest)	340	10.3	262	9.2	301	9.9	324	11.1	688	8.3	167	7.9	114	6.8
2nd	805	8.6	422	11.7	616	7.4	514	9.3	678	8.2	295	7.1	258	4.6
3rd	479	9.0	653	8.0	377	10.1	644	8.3	671	5.6	354	6.4	151	4.2
4th	1131	6.3	989	6.0	978	6.0	941	6.1	246	5.4	778	5.1	848	4.3
5th (richest)	601	4.0	811	4.1	764	3.5	991	4.6	639	3.9	602	3.5	521	3.0
Location														
Rural	3399	6.6	3275	6.4	2773	5.8	3440	6.8					1885	4.2
Urban	83	4.8	110	3.5	328	5.1	200	3.4					249	2.4

E.6.2 Group-wise significance

The table below shows the difference in drop-out rates over various groups – age, gender, disability, wealth and location. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 106 ASER: Drop-out rate, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
Age group							
diff. (5-9 yrs)-(10-12 yrs)	-0.046***	-0.046***	-0.035***	-0.045***	-0.038***	-0.033***	-0.015***
diff. (5-9 yrs)-(13-16 yrs)	-0.151***	-0.143***	-0.128***	-0.139***	-0.144***	-0.118***	-0.087***
diff. (10-12 yrs)-(13-16yrs)	-0.105***	-0.097***	-0.093***	-0.094***	-0.106***	-0.084***	-0.072***
Gender							
diff. (Female)-(Male)	0.015***	0.007***	0.007***	0.012***	0.008***	0.003	0.007***
Disability							
diff. (None)-(Mild to moderate)				0.004	0.013*	-0.011	
diff. (None)-(Severe)				0.003	-0.009	-0.084***	
diff. (Mild to moderate)-(Severe)				-0.002	-0.023	-0.073***	
Wealth index quintile							
diff. (1)-(2)	0.015**	-0.022**	0.025***	0.019**	0	0.008	0.023***
diff. (1)-(3)	0.011	0.013*	-0.003	0.029***	0.027***	0.016*	0.026***
diff. (1)-(4)	0.039***	0.033***	0.039***	0.050***	0.029***	0.029***	0.025***
diff. (1)-(5)	0.062***	0.052***	0.064***	0.066***	0.044***	0.044***	0.039***
diff. (2)-(3)	-0.004	0.035***	-0.028***	0.010*	0.028***	0.008	0.003
diff. (2)-(4)	0.024***	0.055***	0.014***	0.032***	0.030***	0.020***	0.002
diff. (2)-(5)	0.047***	0.074***	0.039***	0.047***	0.044***	0.036***	0.016***
diff. (3)-(4)	0.028***	0.021***	0.042***	0.022***	0.002	0.013***	-0.001
diff. (3)-(5)	0.051***	0.039***	0.066***	0.037***	0.016***	0.028***	0.013***
diff. (4)-(5)	0.023***	0.018***	0.025***	0.016***	0.014***	0.015***	0.013***
Location							
diff. (Rural) – (Urban)	0.018**	0.029***	0.007*	0.033***			0.018***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in drop-out rates over the earliest and latest rounds, and other various groups.

Annex Table 107 ASER: Drop-out rate, significance over time

	diff. (2012)-(2019)
Overall	0.027***
Age group	
5-9 years	0.001
10-12 years	0.032***
13-16 years	0.065***
Gender	
Female	0.032***
Male	0.024***
Wealth index quintile	
1st (poorest)	0.033***
2nd	0.041***
3rd	0.048***
4th	0.020***
5th (richest)	0.010***
Location	
Rural	0.024***
Urban	0.025***

*p<0.05, **p<0.01, ***p<0.001

E.6.3 Provincial comparison

The tables below provide national geographical comparisons in drop-out rates. For instance, in 2012 the drop-out rate is highest in Punjab and Sindh at 6.6%.

Annex Table 108 ASER: Drop-out rate by province

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	414	3.1	355	2.4	410	3.2	353	2.3	282	1.8	318	2.3	234	1.7
Balochistan	479	1.0	3638	7.6	4581	8.6	3802	6.8	4935	9.7	5932	10.6	5424	10.0
FATA	499	3.3	673	4.2	680	4.4	745	3.9	536	3.6	940	5.2	1123	5.9
Gilgit-Baltistan	309	2.7	299	2.4	370	3.1	312	2.8	265	2.4	334	2.3	548	2.5
Islamabad-ICT	35	3.0	27	1.9	0	0.0	6	0.5	9	1.6	47	4.0	45	2.9
KPK	1407	3.9	1650	4.0	1697	4.0	1240	3.1	1701	4.9	1562	4.5	1784	4.9
Punjab	3482	6.6	3385	6.2	3101	5.7	3640	6.4	2996	5.9	2419	4.9	2134	3.9
Sindh	2387	6.6	2280	5.4	2258	4.7	2147	4.7	1727	4.6	948	3.0	1405	3.5
Total	9012	4.2	12307	5.3	13097	5.5	12245	5.0	12451	5.8	12500	5.7	12697	5.2

The table below captures the difference between Punjab and other provinces in Pakistan on the drop-out rate. Stars have used to depict statistical significance.

Annex Table 109 ASER: Drop-out rate, significance by province/region

	2012	2013	2014	2015	2016	2018	2019
diff. (Punjab)-(Sindh)	0	0.008***	0.010***	0.017***	0.012***	0.019***	0.004***
diff. (Punjab)-(Balochistan)	0.056***	-0.015***	-0.029***	-0.004*	-0.039***	-0.057***	-0.061***
diff. (Punjab)-(KP)	0.027***	0.022***	0.018***	0.033***	0.010***	0.004**	-0.010***
diff. (Punjab)-(GB)	0.038***	0.038***	0.027***	0.036***	0.035***	0.026***	0.014***
diff. (Punjab)-(AJK)	0.034***	0.038***	0.026***	0.041***	0.041***	0.026***	0.022***
diff. (Punjab)-(Islamabad)	0.036***	0.043***	0.057***	0.059***	0.043***	0.01	0.010*
diff. (Punjab)-(FATA)	0.033***	0.019***	0.014***	0.025***	0.022***	-0.003	-0.020***

*p<0.05, **p<0.01, ***p<0.001

E.7 Learning levels

ASER carries out learning assessments at the household level for reading, mathematics and English. In each of these subjects, participations are graded on a five level scale, depending on the type of tasks they are able to complete, as shown in the table below. Statistics in this section provide percentages of children aged 5-16 years that are able to complete each level.

Annex Table 110 ASER: Learning assessment grading

Levels	Reading	Mathematics	English
1	Beginner (child is not able to complete below tasks)		
2	Recognition of alphabet/letters	Number recognition [1-9]	Recognition of capital letters
3	Recognition of words	Number recognition [10-99]	Recognition of small letters
4	Reading sentence/paragraph	Number recognition [100-200][58]	Reading simple words
5	Reading story	Subtraction	Reading sentences
6		Division	

Tables under this section are divided by subject. Under each subject category there are overall tables (where learning levels are provided over selected variables), gender disaggregated tables and provincial comparison tables.

Note: Instead of calculating statistics over age groups (like in this document before), class level has been used as a secondary variable as the ASER reports provide learning levels by class.

E.7.1 Reading learning levels

While the majority of reading assessments are given in Urdu in Punjab, there are some children that do opt for Sindhi and Pashto. Thus, reading assessment levels has been disaggregated by language tested from 2013 onwards.

E.7.1.1 Overall reading learning levels

These tables provide overall learning levels and further disaggregations by gender, disability, class level, school type, school participation (out of school children), wealth quintiles and urban/rural.

For instance, in 2012, 17.3% of children are not able to read anything. In the same year 54.5% (12.5% + 42%) of children are able to read sentences. Furthermore, 52.7% (12% + 40.7%) of girls are able to read sentences in comparison to 55.8% (12.8% + 43) of boys that are able to read, in the same year.

[58] This level was introduced in 2018 onwards.

Annex Table 111 ASER: Overall reading learning levels, 2012

Reading learning levels (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	17.3	12.6	15.6	12.5	42	100
Gender						
Female	18.7	12.9	15.8	12.0	40.7	100
Male	16.2	12.4	15.6	12.8	43	100
Class level						
Primary	11.4	16.1	24.2	17.4	31	100
Middle	2.3	0.8	3.2	10.0	83.8	100
Secondary	0.0	0.0	0.2	4.1	95.7	100
School type						
Government	11.5	12.1	15.9	13.5	47.0	100
Private	10.4	15.0	17.9	13.1	43.7	100
Madrassa	32.9	16.8	17.3	11.0	22.1	100
Other	15.4	16.9	17.3	13	37.3	100
Participating in school						
No	65.7	8.5	8.0	5.5	12.2	100
Yes	11.4	13.1	16.6	13.3	45.6	100
Wealth index quintile						
1st (poorest)	33.6	14.7	17.3	8.8	25.6	100
2nd	23.4	14.9	16.9	11.7	33.0	100
3rd	19.8	14.8	16.7	12.2	36.4	100
4th	15.2	11.8	16.0	13.0	44.0	100
5th (richest)	11.5	11.0	14.2	13.1	50.1	100
Location						
Rural	17.6	12.8	15.7	12.4	41.6	100
Urban	8.2	8.7	14.5	13.8	54.8	100

Annex Table 112 ASER: Overall reading learning levels, 2013

Reading learning levels (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	15.1	13.6	16.0	13.1	42.2	100
Language tested						
Urdu	15.0	13.4	15.7	13.0	42.8	100
Sindhi	24.1	22.4	22.4	10.3	20.7	100
Pashto	27.8	19.0	29.1	10.1	13.9	100
Gender						
Female	15.6	13.6	16.1	12.9	41.8	100
Male	14.8	13.5	15.9	13.2	42.6	100
Class level						
Primary	11.3	16.8	24.5	18.5	28.9	100
Middle	1.8	2.3	4.1	10.2	81.6	100
Secondary	1.5	2.1	1.7	3.9	90.8	100
School type						
Government	12.1	12.8	15.6	13.2	46.4	100
Private	11.1	15.1	17.7	14.4	41.8	100
Madrassa	27.8	23.9	14.9	9.3	24.2	100
Other	21.1	17.0	24.7	10.7	26.5	100
Participating in school						
No	54.4	10.9	10.2	7.4	17.1	100
Yes	12.0	13.8	16.5	13.5	44.3	100
Wealth index quintiles						
1st (poorest)	40.1	15.2	15.3	8.6	20.8	100
2nd	24.9	15.6	16.2	13.2	30.2	100
3rd	18.0	15.5	17.3	13.1	36.1	100
4th	12.7	14.1	16.7	13.7	42.7	100
5th (richest)	10.9	11.5	14.6	13.3	49.7	100
Location						
Rural	15.5	13.7	16.1	13.1	41.5	100
Urban	9.7	10.8	13.7	12.2	53.4	100

Annex Table 113 ASER: Overall reading learning levels, 2014

Reading learning levels (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	14.6	13.3	16.9	13.0	42.2	100
Language tested						
Urdu	14.7	13.1	16.8	12.9	42.5	100
Sindhi	20.8	23.6	18.1	11.1	26.4	100
Pashto	11.6	22.3	22.6	8.2	35.2	100
Gender						
Female	16.0	13.4	16.9	12.8	40.9	100
Male	13.6	13.2	17.0	13.2	43.1	100
Class level						
Primary	10.2	16.6	25.8	18.8	28.6	100
Middle	1.3	2.3	5.2	10.5	80.8	100
Secondary	1.2	1.3	2.7	2.8	92	100
School type						
Government	9.0	11.6	17.1	13.9	48.4	100
Private	12.3	16.1	18.5	13.6	39.5	100
Madrassa	18.4	21.9	20.3	11.0	28.3	100
Other	16.7	14.3	13.1	12.0	43.9	100
Participating in school						
No	58.6	10.9	9.8	5.4	15.3	100
Yes	10.5	13.5	17.6	13.7	44.7	100
Wealth index quintile						
1st (poorest)	32.4	18.0	16.9	9.8	22.9	100
2nd	22.3	15.6	17.4	11.2	33.5	100
3rd	18.3	14.9	14.8	12.7	39.3	100
4th	14.1	13.6	16.9	13	42.3	100
5th (richest)	9.4	11.2	17.0	14.2	48.2	100
Location						
Rural	15.4	13.8	16.8	12.5	41.5	100
Urban	9.0	8.9	17.6	17	47.5	100

Annex Table 114 ASER: Overall reading learning levels, 2015

Reading learning levels (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	13.8	14.0	16.1	13.4	42.7	100
Language tested						
Urdu	13.8	14.0	16.1	13.4	42.7	100
Gender						
Female	14.6	14.3	16.0	13.1	41.9	100
Male	13.2	13.8	16.2	13.6	43.2	100
Disability						
None	14.2	14.3	15.5	13.0	43.0	100
Mild to moderate	21.8	15.3	16.4	12.5	34.0	100
Severe	61	7.6	22.0	1.7	7.6	100
Class level						
Primary	10.0	16.9	24.0	19.2	29.9	100
Middle	1.3	1.3	3.2	8.9	85.2	100
Secondary	1.3	0.4	0.6	3.9	93.8	100
School type						
Government	11	13.2	16.2	14.0	45.5	100
Private	9.9	15.1	17.1	13.7	44.3	100
Madrassa	29.7	20.7	16.9	10.3	22.4	100
Other	20.1	21.7	15.9	11.8	30.5	100
Participating in school						
No	50.1	13.2	10.6	7.8	18.3	100
Yes	10.9	14.1	16.6	13.8	44.6	100
Wealth index quintile						
1st (poorest)	26.3	19.7	15.7	11.7	26.5	100
2nd	19.3	17.9	17.1	12.6	33.1	100
3rd	15.7	14.9	17.5	13.5	38.5	100
4th	12.7	13.8	16.1	13.6	43.9	100
5th (richest)	10.4	12.4	15.5	13.9	47.9	100
Location						
Rural	14.6	14.2	16.1	13.2	41.9	100
Urban	7.5	12.1	16.4	15.2	48.8	100

Annex Table 115 ASER: Overall reading learning levels, 2016

Reading learning levels (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	24.6	11.3	14.7	12.3	37.0	100
Language tested						
Urdu	24.7	11.3	14.5	12.3	37.2	100
Sindhi	28.6	32.1	21.4	0.0	17.9	100
Pashto	19.3	10.1	28.4	14.7	27.5	100
Gender						
Female	26.3	11.5	14.4	12.1	35.7	100
Male	23.4	11.1	14.9	12.5	38.1	100
Disability						
None	24.6	11.1	14.7	12.3	37.3	100
Mild to moderate	22.6	12.5	16.6	13.3	35.0	100
Severe	41.0	10.3	15.4	15.4	17.9	100
Class level						
Primary	14.1	14.5	23.9	19.3	28.1	100
Middle	8.8	1.3	2.8	8.1	79.0	100
Secondary	13.3	0.5	0.7	2.4	83.1	100
School type						
Government	15.3	11.2	15.6	13.8	44.1	100
Private	18.1	13.3	16.8	13.4	38.4	100
Madrassa	40.7	13.6	14.8	7.4	23.5	100
Other	21.3	20.1	18.0	11.4	29.2	100
Participating in school						
No	80.9	6.5	5.2	4.0	3.4	100
Yes	16.7	12.0	16.0	13.5	41.8	100
Wealth index quintile						
1st (poorest)	36.0	13.6	14.7	10.0	25.7	100
2nd	28.4	12.3	15.0	11.6	32.7	100
3rd	23.2	10.9	14.8	13.8	37.4	100
4th	22.0	11.3	15.5	12.7	38.5	100
5th (richest)	19.3	9.8	14.0	12.5	44.4	100

Annex Table 116 ASER: Overall reading learning levels, 2018

Reading learning outcomes (%) - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	13.3	13.0	16.5	14.4	42.8	100
Language tested						
Urdu	13.3	12.8	16.5	14.4	43.1	100
Sindhi	17.6	61.8	8.8	8.8	2.9	100
Pashto	13.1	23.0	26.2	6.6	31.1	100
Gender						
Female	13.8	13.1	16.5	14.7	41.9	100
Male	13.0	12.9	16.6	14.0	43.5	100
Disability						
None	13.2	12.9	16.5	14.3	43.0	100
Mild to moderate	15.6	14.2	17.9	14.6	37.8	100
Severe	18.5	11.1	37.0	11.1	22.2	100
Class level						
Pre-primary	49.6	39.5	10.9	0.0	0.0	100
Primary	8.9	14.8	25.1	20.5	30.7	100
Middle	1.9	1.2	3.0	10.0	83.9	100
Secondary	0.6	1.1	0.9	3.2	94.2	100
School type						
Government	10.1	11.8	16.6	15.2	46.3	100
Private	10.1	16.1	18.1	14.5	41.1	100
Madrassa	23.3	21.7	11.7	12.7	30.7	100
Other	9.1	18.9	29.3	10.7	32.0	100
Participating in school						
No	55.9	11.9	8.9	6.5	16.9	100
Yes	10.2	13	17.1	14.9	44.7	100
Wealth index quintile						
1st (poorest)	22.4	16.5	18.7	15.8	26.7	100
2nd	18.5	14.5	18.2	15.9	32.9	100
3rd	15.2	12.9	17.4	15.9	38.5	100
4th	12.0	12.7	16.7	14.7	43.9	100
5th (richest)	9.8	12.4	15.1	13.1	49.7	100

Annex Table 117 ASER: Overall reading learning levels, 2019

Reading learning outcomes - Children who can read…						
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**
Overall	15.0	9.7	13.9	12.4	49.1	100
Language tested						
Urdu	15.0	9.7	13.8	12.4	49.1	100
Sindhi	12.8	12.0	16.5	17.3	41.4	100
Pashto	19.8	9.4	24.5	12.3	34	100
Gender						
Female	15.3	10.0	13.8	12.3	48.6	100
Male	14.7	9.5	13.9	12.4	49.5	100
Total	15.0	9.7	13.9	12.4	49.1	100
Class level						
Pre-primary	52.4	31.8	11.0	2.5	2.4	100
Primary	9.9	13.2	22.5	18.7	35.7	100
Middle	3.7	0.6	2.1	6.1	87.6	100
Secondary	2.6	0.3	0.6	2	94.5	100
School type						
Government	9.1	8.7	14.2	13.1	55	100
Private	13.7	13.0	14.9	12.2	46.2	100
Madrassa	24	6.2	11.6	7.3	50.9	100
Other	9.5	13.7	19.4	11.4	46.0	100
Participating in school						
No	66.5	4.2	6.6	7.8	14.9	100
Yes	11.0	10.2	14.4	12.7	51.7	100
Wealth index quintile						
1st (poorest)	26.5	11.1	13.4	11.9	37.1	100
2nd	22.5	8.8	13.0	9.3	46.3	100
3rd	18.7	11.6	13.3	11.4	44.9	100
4th	13.4	10.3	14.5	13.5	48.3	100
5th (richest)	11.0	8.9	13.3	12.4	54.4	100
Location						
Rural	16.6	9.9	14.0	11.8	47.7	100
Urban	8.3	9.2	13.2	14.6	54.7	100

E.7.1.2 Reading gender disaggregation

The tables in this section provide gender wise reading learning levels by school type, wealth index quintiles and urban/rural. In government schools, 59% (13.3% + 45.7%) of girls are able to read sentences while 61.5% (13.6% + 47.9%) of boys are able to read sentences.

Annex Table 118 ASER: Reading learning levels by gender, 2012

Reading learning levels (%) - Children who can read…												
ASER 2012	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Govt.	11.3	13.1	16.5	13.3	45.7	100	11.6	11.4	15.5	13.6	47.9	100
Private	10.1	14.3	17.6	12.9	45.1	100	10.6	15.5	18.1	13.2	42.6	100
Madrassa	32.6	12.9	19.1	11.8	23.6	100	33.1	19.7	15.9	10.5	20.9	100
Other	14.7	18.8	16.1	12.8	37.6	100	16.2	14.7	18.8	13.2	37.1	100
Total	11.2	13.6	16.9	13.1	45.2	100	11.6	12.8	16.3	13.5	45.9	100
Wealth index quintiles												
1st (poorest)	40.7	13.8	16.4	8.5	20.6	100	28.9	15.3	17.9	9.0	28.8	100
2nd	26.9	14.8	17.4	11.4	29.4	100	20.9	15.0	16.5	12.0	35.6	100
3rd	21.7	15.3	17.5	10.6	34.9	100	18.5	14.5	16.1	13.4	37.5	100
4th	16.7	12.5	16.4	12.4	42.0	100	14.1	11.2	15.7	13.4	45.5	100
5th (richest)	11.1	11.2	13.7	13.0	51.1	100	11.9	10.9	14.6	13.2	49.3	100
Total	18.5	12.8	15.8	12.0	40.8	100	16.0	12.4	15.7	12.8	43.0	100
Location												
Rural	19.0	13.0	15.7	12.0	40.2	100	16.5	12.6	15.6	12.8	42.5	100
Urban	8.8	8.5	16.5	12.9	53.4	100	7.7	8.9	12.8	14.7	56.0	100
Total	18.7	12.9	15.8	12.0	40.7	100	16.2	12.4	15.6	12.8	43.0	100

Annex Table 119 ASER: Reading learning levels by gender, 2013

Reading learning levels (%) - Children who can read…												
ASER 2013	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Govt.	12.2	13.4	15.9	13.2	45.3	100	11.9	12.4	15.3	13.2	47.2	100
Private	10.4	14.3	17.6	14.1	43.6	100	11.6	15.7	17.9	14.5	40.4	100
Madrassa	22.9	25.0	16.7	9.7	25.7	100	30.6	23.3	13.9	9.0	23.3	100
Other	22.8	16.4	28.8	9.6	22.4	100	19.3	17.7	20.1	11.8	31.1	100
Total	11.8	13.9	16.8	13.5	44.1	100	12.1	13.7	16.2	13.6	44.4	100
Wealth index quintiles												

1st (poorest)	43.7	14.2	16.0	7.0	19.2	100	38.0	15.8	14.9	9.5	21.6	100
2nd	28.7	16.0	13.8	13.3	28.2	100	22.5	15.3	17.7	13.1	31.4	100
3rd	17.8	16.2	18.1	12.4	35.5	100	18.2	15.1	16.6	13.6	36.5	100
4th	13.4	14.5	17.3	13.5	41.3	100	12.2	13.9	16.2	13.9	43.8	100
5th (richest)	11.1	11.2	14.8	13.3	49.6	100	10.7	11.7	14.5	13.3	49.8	100
Total	15.3	13.5	16.1	13.0	42.2	100	14.6	13.4	15.7	13.3	43.0	100
Location												
Rural	16.1	13.8	16.3	13.0	40.8	100	15.1	13.7	16.0	13.2	42.0	100
Urban	8.8	11.3	14.1	11.1	54.8	100	10.6	10.5	13.4	13.3	52.2	100
Total	15.6	13.6	16.1	12.9	41.8	100	14.8	13.5	15.9	13.2	42.6	100

Annex Table 120 ASER: Reading learning levels by gender, 2014

Reading learning levels (%) - Children who can read…												
ASER 2014	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Govt.	9.5	11.6	17.4	14.1	47.3	100	8.7	11.5	16.8	13.8	49.2	100
Private	12.8	16.2	18.6	13.3	39.2	100	11.9	16.1	18.4	13.8	39.8	100
Madrassa	19.5	22.0	21.3	8.5	28.7	100	17.6	21.9	19.5	12.9	28.1	100
Other	19.0	11.8	12.2	14.3	42.6	100	14.7	16.5	13.9	9.9	45.1	100
Total	11.0	13.5	17.9	13.7	43.9	100	10.1	13.4	17.4	13.7	45.3	100
Wealth index quintiles												
1st (poorest)	36.8	18.6	16.7	9.2	18.6	100	29.3	17.6	17.0	10.3	25.9	100
2nd	25.5	15.2	17.3	11.4	30.6	100	20.1	15.9	17.5	11.1	35.4	100
3rd	21.9	15.0	13.6	12.3	37.2	100	15.5	14.8	15.7	13.1	40.9	100
4th	15.1	14.1	16.8	12.8	41.2	100	13.4	13.1	17.0	13.2	43.2	100
5th (richest)	10.2	11.2	17.1	14.0	47.5	100	8.7	11.3	16.9	14.3	48.8	100
Total	16.0	13.3	16.8	12.9	41.0	100	13.5	13.1	16.9	13.2	43.2	100
Location												
Rural	16.8	13.9	16.8	12.3	40.1	100	14.3	13.8	16.9	12.6	42.5	100
Urban	9.9	9.3	17.5	16.4	46.8	100	8.2	8.6	17.7	17.5	48.0	100
Total	16.0	13.4	16.9	12.8	40.9	100	13.6	13.2	17.0	13.2	43.1	100

Annex Table 121 ASER: Reading learning levels by gender, 2015

Reading learning levels (%) - Children who can read…												
ASER 2015	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Govt.	11.3	13.5	16.4	13.9	44.9	100	10.9	13.0	16.1	14.2	45.9	100
Private	9.8	14.9	16.9	13.6	44.8	100	9.9	15.2	17.3	13.7	43.8	100
Madrassa	26.8	21.2	17.2	12.1	22.7	100	31.9	20.4	16.7	8.9	22.2	100
Other	15.1	21.0	16.7	13.9	33.3	100	24.2	22.2	15.4	10.1	28.1	100
Total	11.0	14.2	16.6	13.8	44.5	100	10.9	14.0	16.5	13.9	44.7	100
Wealth index quintiles												
1st (poorest)	27.9	19.9	16.4	12.1	23.7	100	25.3	19.6	15.3	11.5	28.4	100
2nd	21.6	18.7	16.7	11.3	31.7	100	17.6	17.3	17.4	13.5	34.1	100
3rd	17.5	14.8	17.0	15.0	35.7	100	14.4	14.9	17.9	12.4	40.4	100
4th	13.6	14.6	16.2	13.2	42.3	100	12.0	13.2	15.9	13.9	45.0	100
5th (richest)	10.5	12.6	15.3	13.2	48.4	100	10.3	12.3	15.6	14.4	47.4	100
Total	14.2	14.4	16.0	13.2	42.1	100	12.9	13.8	16.2	13.7	43.4	100
Location												
Rural	15.6	14.5	16.0	13.0	40.9	100	13.8	14.0	16.2	13.3	42.7	100
Urban	7.3	12.4	16.2	14.1	50.0	100	7.6	12.0	16.6	16.1	47.7	100
Total	14.6	14.3	16.0	13.1	41.9	100	13.2	13.8	16.2	13.6	43.2	100

Annex Table 122 ASER: Reading learning levels by gender, 2016

Reading learning levels (%) - Children who can read…												
ASER 2016	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Govt.	15.9	11.7	15.9	13.5	43.0	100	14.9	10.9	15.4	14.0	44.8	100
Private	18.5	13.1	16.3	13.5	38.5	100	17.8	13.4	17.2	13.3	38.3	100
Madrassa	39.2	13.4	14.2	6.9	26.3	100	41.8	13.7	15.2	7.8	21.5	100
Other	21.6	18.8	17.3	12.2	30.2	100	21.0	21.3	18.8	10.7	28.3	100
Total	17.1	12.3	16.1	13.4	41.2	100	16.2	11.8	16.0	13.6	42.3	100
Wealth index quintiles												
1st (poorest)	40.8	14.6	14.1	9.4	21.1	100	32.3	12.9	15.1	10.5	29.2	100

2nd	30.0	13.1	14.7	12.1	30.1	100	27.2	11.6	15.2	11.3	34.7	100
3rd	24.6	11.4	14.9	13.4	35.8	100	22.0	10.5	14.7	14.2	38.6	100
4th	22.4	11.8	16.0	12.7	37.1	100	21.7	10.8	15.2	12.6	39.6	100
5th (richest)	19.8	9.1	13.5	12.4	45.2	100	18.8	10.4	14.4	12.7	43.8	100
Total	26.4	11.4	14.4	12.1	35.7	100	23.5	11.1	14.8	12.4	38.2	100

Annex Table 123 ASER: Reading learning levels by gender, 2018

Reading learning outcomes (%) - Children who can read…												
ASER 2018	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Government	10.2	11.9	16.8	15.6	45.6	100	10.1	11.7	16.5	14.9	46.9	100
Private	10.2	16	17.9	15.1	40.7	100	10	16.2	18.3	13.9	41.5	100
Madrassa	19.3	21.8	14.3	14.3	30.3	100	26	21.5	9.9	11.6	30.9	100
Other	12.3	16.8	25.7	11.7	33.5	100	6.1	20.9	32.7	9.7	30.6	100
Total	10.2	13.1	17.2	15.4	44.1	100	10.2	13	17	14.6	45.2	100
Wealth index quintile												
1st (poorest)	24.8	16.4	18.3	15.6	24.8	100	20.6	16.5	18.9	16	28	100
2nd	19.1	14.7	18.3	16.9	31	100	17.9	14.3	18.2	15.1	34.5	100
3rd	16.5	13.7	17.6	16	36.3	100	14.3	12.3	17.3	15.8	40.3	100
4th	12.1	12.9	17.1	15.3	42.6	100	12	12.5	16.4	14.2	44.9	100
5th (richest)	9.9	12.4	14.8	13.2	49.6	100	9.6	12.4	15.3	12.9	49.8	100
Total	13	13.1	16.4	14.8	42.7	100	12.3	12.8	16.4	14.1	44.5	100

Annex Table 124 ASER: Reading learning levels by gender, 2019

Reading learning outcomes (%) - Children who can read…												
ASER 2019	**Female**						**Male**					
	Nothing	**Letters**	**Words**	**Sentences**	**Story**	**Total**	**Nothing**	**Letters**	**Words**	**Sentences**	**Story**	**Total**
School type												
Government	9.1	8.8	14.4	12.9	54.7	100	9.1	8.6	14	13.2	55.1	100
Private	13.9	13.6	14.5	12	46	100	13.5	12.5	15.3	12.5	46.3	100
Madrassa	26.5	7.1	7.1	8.4	51	100	22.2	5.6	14.8	6.5	50.9	100
Other	11.6	13	17.8	11.6	45.9	100	7.7	14.2	20.7	11.2	46.2	100
Total	11	10.6	14.4	12.5	51.4	100	10.8	10	14.5	12.9	51.9	100
Wealth index quintile												
1st (poorest)	26.9	11.7	12.8	10.7	37.8	100	26.3	10.5	13.9	12.8	36.5	100
2nd	21.8	9.4	12.7	8.8	47.3	100	23.1	8.4	13.2	9.8	45.5	100

3rd	18.8	12.8	13.2	10.9	44.3	100	18.7	10.8	13.5	11.8	45.4	100
4th	14	10.8	13.9	13.8	47.5	100	12.8	9.9	15	13.3	49	100
5th (richest)	11.4	8.8	13.8	12.6	53.5	100	10.7	8.9	12.9	12.3	55.2	100
Total	14.7	10.1	13.6	12.4	49.2	100	14.2	9.4	13.9	12.4	50.2	100
Location												
Rural	16.9	10.2	13.9	11.8	47.1	100	16.3	9.6	14.1	11.8	48.2	100
Urban	8.4	9.4	13.3	14.3	54.6	100	8.2	9	13.1	14.9	54.7	100
Total	15.3	10	13.8	12.3	48.6	100	14.7	9.5	13.9	12.4	49.5	100

E.7.1.3 Reading provincial comparison

The tables below provides provincial reading learning levels. In Balochistan, 34.5% of children aged 5-16 years are not able to reading anything and only 29.9% (12.1% + 17.8%) are able to read sentences.

Annex Table 125 ASER: Reading learning levels by province, 2012

ASER 2012	Reading learning levels (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	7.6	12.7	18.3	13.9	47.6	100
Balochistan	34.5	16.4	19.2	12.1	17.8	100
FATA	27.8	14.8	24.3	12.6	20.4	100
Gilgit-Baltistan	15.5	16.0	16.4	15.4	36.7	100
Islamabad-ICT	7.2	5.7	14.0	24.1	49.0	100
KPK	19.5	12.4	22.1	14.4	31.6	100
Punjab	17.3	12.6	15.6	12.5	42.0	100
Sindh	33.7	20.5	17.3	9.8	18.8	100
Total	24	15	18.6	12.6	29.9	100

Annex Table 126 ASER: Reading learning levels by province, 2013

ASER 2013	Reading learning levels (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	7.1	13.7	16.2	15.7	47.3	100
Balochistan	27.6	21.8	18.9	11.9	19.8	100
FATA	19.8	16.5	26.4	14.6	22.8	100
Gilgit-Baltistan	13.8	18.6	18.8	16.8	32.0	100
Islamabad - ICT	14.8	10.3	15.7	19.8	39.4	100
KPK	14.1	15.6	23.2	16.6	30.5	100
Punjab	15.1	13.6	16.0	13.1	42.2	100
Sindh	27.1	18.9	18.7	12.0	23.2	100
Total	19.4	17.1	19.2	13.8	30.4	100

Annex Table 127 ASER: Reading learning levels by province, 2014

ASER 2014	Reading learning levels (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	8.7	12.4	18.5	16.2	44.3	100
Balochistan	27.1	20.7	21.3	14.6	16.2	100
FATA	15.2	16.7	25.6	16.7	25.8	100
Gilgit-Baltistan	13.0	17.4	18.5	15.2	35.9	100
Islamabad - ICT	4.9	8.6	21.5	21.5	43.5	100
KPK	12.9	15.6	22.9	19.1	29.5	100
Punjab	14.6	13.3	16.9	13.0	42.2	100
Sindh	21.8	19.2	18.3	13.3	27.5	100
Total	18.1	16.8	20.0	15.1	30.0	100

Annex Table 128 ASER: Reading learning levels by province, 2015

ASER 2015	Reading learning levels (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	7.7	10.2	14.9	15.4	51.7	100
Balochistan	27.5	21.2	20.9	12.8	17.6	100
FATA	17.8	15.1	22.4	17.2	27.5	100
Gilgit-Baltistan	15.0	15.1	15.2	16.3	38.4	100
Islamabad - ICT	5.0	7.7	15.4	12.9	59.0	100
KPK	12.1	12.2	21.4	20.8	33.5	100
Punjab	13.8	14.0	16.1	13.4	42.7	100
Sindh	22.4	17.9	18.5	14.1	27.0	100
Total	18.1	15.9	18.9	15.2	32.0	100

Annex Table 129 ASER: Reading learning levels by province, 2016

ASER 2016	Reading learning levels (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	6.8	8.3	13.2	9.7	62.1	100
Balochistan	37.1	18.1	18.6	11.2	15.0	100
FATA	29.3	16.4	21.9	13.1	19.3	100
Gilgit-Baltistan	26.8	12.1	15.5	14.2	31.4	100
Islamabad - ICT	10.0	16.0	15.0	12.3	46.7	100
KPK	27.1	12.6	18.5	14.4	27.5	100
Punjab	24.6	11.3	14.7	12.3	37.0	100
Sindh	30.3	19.6	19.7	13.2	17.1	100
Total	27.8	14.7	17.5	12.5	27.6	100

Annex Table 130 ASER: Reading learning levels by province, 2018

ASER 2018	Reading learning outcomes (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	6.9	10.1	13.5	14.0	55.5	100
Balochistan	26.4	25.3	21.5	12.9	14.0	100
FATA	25.8	14.0	21.5	16.5	22.2	100
Gilgit-Baltistan	12.1	15.3	16.9	15.6	40.0	100
Islamabad - ICT	19.8	7.3	11.7	12.7	48.5	100

KPK	14.6	14.2	19.3	15.3	36.6	100
Punjab	13.3	13	16.5	14.4	42.8	100
Sindh	18.9	21.2	23.1	13.8	22.9	100
Total	18.1	17.4	19.4	14.3	30.9	100

Annex Table 131 ASER: Reading learning levels by province, 2019

ASER 2019	Reading learning outcomes (%) - Children who can read…					
	Nothing	Letters	Words	Sentences	Story	Total
AJK	11.2	8.8	14.3	13.8	51.9	100
Balochistan	35.2	14.8	15.6	13.3	21.1	100
FATA	33.0	16.7	19.6	14.6	16.2	100
Gilgit-Baltistan	31.1	12.1	12.9	11.3	32.7	100
Islamabad - ICT	7.0	10.5	17.4	17.4	47.7	100
KPK	25.4	12.1	19.4	13.7	29.5	100
Punjab	15.0	9.7	13.9	12.4	49.1	100
Sindh	26.0	19.2	16.4	10.8	27.6	100
Total	25.5	13.5	15.9	12.7	32.3	100

E.7.2 Mathematics learning levels

E.7.2.1 Overall mathematics learning levels

These tables provide overall mathematics learning levels and further disaggregations by gender, disability, class level, school type, school participation (out of school children), wealth quintiles and urban/rural.

Learning assessments from 2012 show that 17.1% of children aged 5 to 16 years are not able to carry out any mathematical operations. Furthermore 52.1% (16.1% + 36%) of children are able to subtract. Comparing scores across genders show that 50% (15.5% + 34.5%) of girls are able to subtract while 53.7% (16.5% + 37.2%) of boys are able to subtract in the same year.

Annex Table 132 ASER: Overall maths learning levels, 2012

Math learning levels (%) - children who can...						
ASER 2012	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
Overall	17.1	10.7	20.0	16.1	36.0	100
Gender						
Female	18.8	10.9	20.3	15.5	34.5	100
Male	15.9	10.6	19.8	16.5	37.2	100
Class level						
Primary	11.5	13.3	30.2	21.4	23.6	100
Middle	2.2	0.8	5.0	15.6	76.5	100
Secondary	0.0	0.0	1.0	6.9	92.1	100
School type						
Government	11.4	10.5	19.8	17.3	41.0	100
Private	10.5	12.4	23.6	17.0	36.5	100
Madrassa	31.6	16.2	20.4	13.1	18.8	100

Other	17.4	13.3	24.4	17.6	27.3	100
Participating in school						
No	64.9	7.0	11.3	6.8	10.0	100
Yes	11.4	11.2	21.1	17.2	39.2	100
Wealth index quintile						
1st (poorest)	32.4	13.7	21.5	10.8	21.6	100
2nd	23.7	12.7	20.1	15.2	28.2	100
3rd	19.7	11.8	21.6	16.5	30.4	100
4th	15.2	9.8	20.7	16.8	37.5	100
5th (richest)	11.3	9.8	18.5	16.6	43.9	100
Location						
Rural	17.4	10.9	20.1	16.0	35.6	100
Urban	8.7	6.8	17.2	18.8	48.5	100

Annex Table 133 ASER: Overall maths learning levels, 2013

Math learning levels (%) - children who can...						
ASER 2013	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
Overall	15.1	12.0	19.4	16.4	37.1	100
Gender						
Male	14.7	11.6	19.3	16.4	38.0	100
Female	15.7	12.4	19.5	16.4	36.0	100
Class level						
Primary	11.5	14.7	28.6	22.1	23.0	100
Middle	1.8	1.8	6.1	15.2	75.1	100
Secondary	1.8	1.4	2.7	6.7	87.4	100
School type						
Government	11.8	11.3	18.9	16.8	41.2	100
Private	11.5	13.3	21.2	17.7	36.3	100
Madrassa	36.2	19.7	14.9	8.5	20.8	100
Other	20.3	18.0	27.2	12.4	22.1	100
Participating in school						
No	53.2	9.0	14.5	9.1	14.2	100
Yes	12.1	12.2	19.8	17.0	39.0	100
Wealth index quintile						
1st (poorest)	38.3	15.1	17.8	9.4	19.5	100
2nd	24.5	14.1	20.2	15.0	26.3	100
3rd	18.2	13.5	20.4	16.5	31.4	100
4th	13.0	12.6	19.9	16.7	37.9	100
5th (richest)	10.8	9.7	18.6	17.7	43.1	100
Location						
Rural	15.5	12.2	19.5	16.4	36.4	100
Urban	9.6	8.1	17.8	16.5	48.0	100

Annex Table 134 ASER: Overall maths learning levels, 2014

Math learning levels (%) - children who can...						
ASER 2014	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
Overall	14.8	11.2	20.7	17.8	35.6	100
Gender						
Female	16.1	11.7	20.6	17.6	34.0	100
Male	13.8	10.8	20.7	17.9	36.8	100
Class level						
Primary	10.5	14.2	30.9	23.9	20.5	100
Middle	1.4	2.0	6.5	17.9	72.1	100
Secondary	1.3	1.3	3.0	6.0	88.4	100
School type						
Government	9.3	9.9	20.4	19.1	41.2	100
Private	12.5	13.7	22.6	18.2	33.0	100
Madrassa	19.5	13.8	27.1	13.8	25.7	100
Other	18.4	11.3	18.8	12.9	38.7	100
Participating in school						
No	57.4	7.7	14.4	8.6	11.9	100
Yes	10.8	11.5	21.3	18.6	37.8	100
Wealth index quintile						
1st (poorest)	33.7	15.2	19.3	13.5	18.3	100
2nd	23.3	12.9	21.3	15.8	26.7	100
3rd	18.0	12.3	21.8	17.0	31.0	100
4th	14.1	11.3	21.2	17.9	35.5	100
5th (richest)	9.3	9.7	19.9	19.1	42.0	100
Location						
Rural	15.6	11.5	20.7	17.5	34.6	100
Urban	8.9	8.4	20.2	19.6	42.9	100

Annex Table 135 ASER: Overall maths learning levels, 2015

Math learning levels (%) - children who can...						
ASER 2015	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
Overall	14.0	10.2	21.6	17.4	36.7	100
Gender						
Female	15.0	10.7	21.6	16.9	35.8	100
Male	13.3	9.8	21.7	17.8	37.4	100
Disability						
None	14.5	10.5	21.5	17.1	36.3	100
Mild to moderate	23.7	10.0	22.6	16.3	27.3	100
Severe	60.3	1.7	28.4	3.4	6.0	100
Class level						
Primary	10.3	11.6	31.1	24.0	22.9	100
Middle	1.3	0.8	6.0	14.3	77.6	100
Secondary	1.5	0.3	2.9	6.0	89.4	100
School type						
Government	11.2	9.8	21.1	18.1	39.8	100
Private	9.9	10.5	23.8	18.3	37.5	100
Madrassa	31.3	15.8	22.0	11.4	19.4	100
Other	22.6	15.2	25.1	15.3	21.8	100
Participating in school						
No	50.8	10.0	15.7	9.2	14.3	100
Yes	11.1	10.2	22.1	18.1	38.5	100
Wealth index quintile						
1st (poorest)	27.0	15.2	22.4	14.2	21.2	100
2nd	19.3	13.1	24.3	16.5	26.7	100
3rd	15.8	11.1	23.3	16.9	32.9	100
4th	12.9	9.9	21.2	18.0	38.0	100
5th (richest)	10.7	8.7	20.7	18.1	41.8	100
Location						
Rural	14.8	10.4	21.9	17.2	35.6	100
Urban	7.5	8.0	19.7	19.1	45.6	100

Annex Table 136 ASER: Overall maths learning levels, 2016

Math learning levels (%) - children who can...						
ASER 2016	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
Overall	24.6	8.5	17.0	15.9	34.0	100
Gender						
Female	26.3	8.7	17.0	15.5	32.5	100
Male	23.3	8.3	17.0	16.1	35.2	100
Disability						
None	24.5	8.4	17.0	15.9	34.2	100
Mild to moderate	21.8	10.0	19.0	18.0	31.2	100
Severe	43.6	10.3	12.8	7.7	25.6	100
Class level						
Primary	14.0	10.6	26.7	23.7	24.9	100
Middle	8.7	1.1	3.9	12.4	74.0	100
Secondary	13.4	0.5	1.5	5.1	79.5	100
School type						
Government	15.0	8.5	17.7	17.7	41.1	100
Private	18.0	10.1	20.0	17.0	34.9	100
Madrassa	42.8	9.9	15.5	11.8	20.0	100
Other	22.7	15.3	22.7	15.5	23.7	100
Participating in school						
No	81.7	4.3	6.6	5.4	2.0	100
Yes	16.5	9.1	18.4	17.4	38.6	100
Wealth index quintile						
1st (poorest)	36.0	9.9	17.2	13.8	23.1	100
2nd	28.3	8.8	17.6	16.0	29.4	100
3rd	22.9	8.3	17.7	17.2	33.8	100
4th	22.1	8.5	17.5	16.5	35.5	100
5th (richest)	19.3	7.8	15.7	15.8	41.4	100

Annex Table 137 ASER: Overall maths learning levels, 2018

Math learning outcomes - children who can...							
ASER 2018	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Recognize 100-200**	**Subtract**	**Divide**	**Total**
Overall	12.4	7.6	10.2	12.0	14.8	43.1	100
Gender							
Female	12.7	7.7	10.2	12.0	14.9	42.5	100
Male	12.1	7.4	10.1	12.0	14.8	43.6	100
Disability							
None	12.3	7.6	10.1	12.0	14.8	43.3	100
Mild to moderate	13.3	8.3	12.4	12.5	17.2	36.3	100
Severe	11.8	5.9	8.8	14.7	17.6	41.2	100
Class level							
Pre-primary	45.7	30.8	15.4	5.9	2.2	0.0	100
Primary	8.7	8.5	15.1	19.0	20.3	28.3	100
Middle	2.0	0.8	1.1	3.2	11.9	81.0	100
Secondary	1.0	0.5	0.8	1.1	6.5	90.1	100
School type							
Government	9.6	7.1	10.3	12.7	15.8	44.4	100
Private	9.2	9.9	12.1	12.7	16.0	40.1	100
Madrassa	21.8	10.8	10.5	7.8	8.1	41.1	100
Other	8.3	12.8	15.4	15.4	19.8	28.4	100
Participating in school							
No	38.3	4.9	4.0	5.2	5.2	42.4	100
Yes	9.6	7.9	10.8	12.7	15.8	43.2	100
Wealth index quintile							
1st (poorest)	19.6	9.4	13.0	12.3	13.2	32.5	100
2nd	16.6	9.6	10.3	12.9	14.4	36.2	100
3rd	14.0	7.8	10.3	12.2	15.5	40.2	100
4th	11.1	7.5	9.6	11.9	15.9	44.1	100
5th (richest)	9.3	6.4	9.9	11.7	14.7	48.0	100

Annex Table 138 ASER: Overall maths learning levels, 2019

Math learning outcomes - children who can...							
ASER 2019	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Recognize 100 -200**	**Subtract**	**Divide**	**Total**
Overall	14.1	6.2	8.5	11.8	14.5	44.9	100
Gender							
Female	14.3	6.3	8.7	11.8	14.5	44.3	100
Male	13.8	6.2	8.4	11.8	14.5	45.3	100
Class level							
Pre-primary	52.3	24.8	13.2	7.0	1.1	1.6	100
Primary	8.7	7.8	12.9	17.8	16.3	36.5	100
Middle	3.5	0.3	0.9	4.2	15.7	75.4	100
Secondary	2.7	0.4	0.8	1.4	16.6	78.2	100
School type							
Government	8.3	5.1	8.5	12.6	15.3	50.2	100
Private	13.1	8.9	9.5	11.0	14.6	42.8	100
Madrassa	19.5	6.3	6.6	8.0	12.1	47.4	100
Other	11.6	5.8	8.0	16.1	14.8	43.7	100
Participating in school							
No	63.1	3.5	4.9	8.8	7.5	12.2	100
Yes	10.3	6.5	8.8	12.0	15.0	47.4	100
Wealth index quintile							
1st (poorest)	24.4	8.1	9.9	12.6	11.2	33.8	100
2nd	21.2	6.7	8.4	10.4	9.1	44.2	100
3rd	17.6	8.0	9.6	11.1	13.0	40.8	100
4th	12.6	6.3	9.2	12.8	15.0	44.2	100
5th (richest)	10.2	5.4	7.6	11.4	15.8	49.6	100
Location							
Rural	15.8	6.2	8.6	12.4	14.0	43.0	100
Urban	6.9	6.4	8.2	9.5	16.4	52.6	100

E.7.2.2 Mathematics gender disaggregation

The tables in this section provide gender wise mathematics learning levels by school type, wealth index quintiles and urban/rural. In government schools, 56.6% (17.1% + 39.5%) of girls are able subtract while 59.5% (17.5% + 42%) of boys are able to subtract in 2012.

Annex Table 139 ASER: Maths learning levels by gender, 2012

Math learning levels (%) - children who can...												
ASER 2012	Female						Male					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
School type												
Govt.	11.4	11.4	20.6	17.1	39.5	100	11.3	9.8	19.3	17.5	42.0	100
Private	10.4	11.6	23.8	16.8	37.4	100	10.6	13.0	23.4	17.2	35.8	100
Madrassa	32.6	13.8	18.8	13.3	21.5	100	30.8	17.9	21.7	12.9	16.7	100
Other	16.7	14.4	23.6	15.7	29.6	100	18.2	12.1	25.3	19.7	24.7	100
Total	11.4	11.6	21.7	16.9	38.4	100	11.4	10.9	20.7	17.4	39.7	100
Wealth index quintiles												
1st (poorest)	40.1	13.5	20.1	8.9	17.4	100	27.5	13.8	22.4	12.0	24.3	100
2nd	27.6	12.8	19.9	14.8	25.0	100	20.9	12.7	20.3	15.5	30.5	100
3rd	22.0	11.3	23.5	15.4	27.8	100	18.0	12.3	20.1	17.3	32.3	100
4th	16.7	10.6	21.1	15.8	35.7	100	14.0	9.3	20.3	17.5	38.9	100
5th (richest)	11.1	9.7	18.5	16.7	44.0	100	11.5	9.8	18.4	16.5	43.8	100
Total	18.7	10.9	20.3	15.5	34.7	100	15.7	10.6	19.9	16.5	37.3	100
Location												
Rural	19.2	11.0	20.3	15.4	34.0	100	16.2	10.7	20.0	16.4	36.8	100
Urban	9.0	7.5	19.4	16.8	47.2	100	8.4	6.3	15.2	20.5	49.7	100
Total	18.8	10.9	20.3	15.5	34.5	100	15.9	10.6	19.8	16.5	37.2	100

Annex Table 140 ASER: Maths learning levels by gender, 2013

Math learning levels (%) - children who can...												
ASER 2013	Female						Male					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
School type												
Govt.	12.1	12.0	19.4	17.0	39.4	100	11.6	10.9	18.5	16.6	42.4	100
Private	10.8	13.5	20.8	17.6	37.3	100	12.1	13.1	21.6	17.8	35.5	100
Madrassa	31.0	22.1	16.6	8.3	22.1	100	39.2	18.4	13.9	8.6	20.0	100
Other	21.1	20.4	29.4	13.3	15.8	100	19.3	15.4	24.8	11.4	29.1	100
Total	12.0	12.8	20.1	17.1	38.1	100	12.1	11.8	19.6	16.9	39.6	100
Wealth index quintiles												
1st (poorest)	43.2	14.5	17.6	8.1	16.6	100	35.3	15.4	17.9	10.1	21.3	100
2nd	27.8	15.3	18.3	16.0	22.6	100	22.4	13.3	21.4	14.4	28.6	100
3rd	17.7	14.7	21.5	16.2	30.0	100	18.5	12.7	19.6	16.7	32.5	100
4th	13.8	13.4	20.2	16.8	35.7	100	12.4	11.9	19.6	16.6	39.5	100
5th (richest)	11.1	9.7	18.6	17.7	42.9	100	10.5	9.7	18.6	17.8	43.3	100
Total	15.4	12.2	19.5	16.7	36.2	100	14.5	11.5	19.2	16.6	38.2	100
Location												
Rural	16.2	12.8	19.6	16.4	35.1	100	15.0	11.8	19.4	16.4	37.4	100
Urban	9.3	8.0	18.3	16.7	47.8	100	9.9	8.2	17.4	16.3	48.2	100
Total	15.7	12.4	19.5	16.4	36.0	100	14.7	11.6	19.3	16.4	38.0	100

Annex Table 141 ASER: Maths learning levels by gender, 2014

Math learning levels (%) - children who can...												
ASER 2014	**Female**						**Male**					
	Nothing	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
School type												
Govt.	9.6	10.6	20.6	19.1	40.0	100	9.1	9.4	20.2	19.1	42.1	100
Private	13.1	14.2	22.5	18.1	32.1	100	12.1	13.4	22.6	18.2	33.7	100
Madrassa	20.6	15.6	21.9	13.1	28.7	100	18.7	12.4	31.1	14.4	23.4	100
Other	22.4	10.5	17.7	12.7	36.7	100	14.9	12.0	19.6	13.1	40.4	100
Total	11.3	12.1	21.4	18.6	36.7	100	10.4	11.0	21.2	18.7	38.7	100
Wealth index quintiles												
1st (poorest)	38.1	16.4	18.8	12.1	14.6	100	30.7	14.3	19.7	14.4	20.9	100
2nd	26.9	12.8	21.3	14.8	24.3	100	20.8	13.0	21.4	16.5	28.4	100
3rd	21.4	13.3	20.5	17.3	27.5	100	15.3	11.4	22.8	16.7	33.8	100
4th	15.1	12.1	21.0	17.9	33.9	100	13.3	10.7	21.3	18.0	36.8	100
5th (richest)	9.9	10.1	20.2	19.0	40.8	100	8.9	9.4	19.6	19.2	42.8	100
Total	16.1	11.6	20.6	17.6	34.1	100	13.7	10.8	20.6	18.0	36.9	100
Location												
Rural	17.0	12.1	20.8	17.3	32.9	100	14.5	11.1	20.7	17.7	35.9	100
Urban	9.7	9.2	19.9	19.6	41.6	100	8.3	7.8	20.4	19.6	43.9	100
Total	16.1	11.7	20.6	17.6	34.0	100	13.8	10.8	20.7	17.9	36.8	100

Annex Table 142 ASER: Maths learning levels by gender, 2015

Math learning levels (%) - children who can...												
ASER 2015	**Female**						**Male**					
	Nothing	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
School type												
Govt.	11.5	10.5	21.6	17.8	38.6	100	11.0	9.4	20.7	18.3	40.5	100
Private	9.8	10.4	23.4	18.1	38.3	100	10.0	10.6	24.0	18.5	36.9	100
Madrassa	32.5	15.5	20.6	10.8	20.6	100	30.5	16.0	23.0	11.9	18.6	100
Other	17.7	16.5	24.2	18.1	23.4	100	26.5	14.1	25.8	13.1	20.6	100
Total	11.2	10.6	22.3	17.8	38.1	100	11.1	9.9	22.0	18.3	38.8	100
Wealth index quintiles												
1st (poorest)	28.2	16.6	23.1	13.0	19.0	100	26.2	14.2	22.0	15.0	22.6	100
2nd	22.6	13.5	24.5	15.8	23.6	100	17.0	12.8	24.2	17.1	28.9	100
3rd	18.0	11.4	23.6	15.9	31.2	100	14.3	10.9	23.1	17.5	34.1	100
4th	13.9	11.0	21.2	17.5	36.4	100	12.2	9.2	21.1	18.3	39.2	100
5th (richest)	10.8	9.0	20.5	17.8	41.9	100	10.6	8.4	20.9	18.3	41.8	100
Total	14.7	10.7	21.6	17.0	36.0	100	13.0	9.7	21.7	17.9	37.6	100
Location												
Rural	16.0	11.0	21.8	16.7	34.4	100	14.0	10.0	21.9	17.6	36.5	100
Urban	7.4	8.1	19.6	18.2	46.7	100	7.6	8.0	19.8	19.9	44.8	100
Total	15.0	10.7	21.6	16.9	35.8	100	13.3	9.8	21.7	17.8	37.4	100

Annex Table 143 ASER: Maths learning levels by gender, 2016

Math learning levels (%) - children who can...												
ASER 2016	**Female**						**Male**					
	Nothing	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**	**Nothing**	**Recognize 1-9**	**Recognize 10-99**	**Subtract**	**Divide**	**Total**
School type												
Govt.	15.6	8.9	17.8	17.7	40.0	100	14.5	8.1	17.6	17.8	41.9	100
Private	18.4	9.9	20.3	16.8	34.6	100	17.8	10.3	19.8	17.1	35.0	100
Madrassa	40.3	11.2	12.9	9.9	25.8	100	44.4	9.0	17.4	13.2	15.9	100
Other	20.7	14.1	24.2	17.6	23.4	100	24.6	16.5	21.4	13.7	23.9	100
Total	16.9	9.4	18.6	17.3	37.8	100	16.1	8.9	18.3	17.4	39.2	100
Wealth index quintiles												
1st (poorest)	40.9	11.3	16.0	13.2	18.6	100	32.2	8.7	18.2	14.3	26.6	100
2nd	30.1	8.8	18.1	16.5	26.6	100	26.9	8.7	17.2	15.6	31.5	100
3rd	24.7	8.5	18.5	16.5	31.8	100	21.5	8.1	17.1	17.8	35.5	100
4th	21.7	9.4	18.3	16.1	34.5	100	22.3	7.7	16.9	16.8	36.3	100
5th (richest)	19.7	7.3	15.3	15.6	42.1	100	19.0	8.1	16.0	16.0	40.8	100
Total	26.4	8.7	16.9	15.6	32.4	100	23.5	8.3	16.9	16.1	35.1	100

Annex Table 144 ASER: Maths learning levels by gender, 2018

Math learning outcomes (%) - children who can...														
	Female							Male						
	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total
School type														
Govt.	9.5	7.2	10.5	13	16.1	43.7	100	9.7	6.9	10.2	12.6	15.6	45	100
Privt.	9.4	9.9	11.9	12.6	16.3	40	100	9.1	9.8	12.3	12.8	15.8	40.2	100
Mad.	21.1	11.6	10.2	7.5	7.5	42.2	100	22.2	10.2	10.7	8.0	8.4	40.4	100
Other	10.9	10.9	15.3	14.2	18.6	30.1	100	6	14.4	15.4	16.4	20.9	26.9	100
Total	9.6	8.0	10.9	12.8	16.1	42.6	100	9.6	7.8	10.8	12.6	15.6	43.6	100
Wealth index quintile														
1st	20.5	10.7	11.6	12.3	13.0	32.0	100	18.9	8.5	14.1	12.3	13.4	32.8	100
2nd	16.8	10.1	10.5	13.0	15.2	34.3	100	16.5	9.3	10.1	12.7	13.8	37.7	100
3rd	15.5	8.3	10.5	11.7	15.2	38.7	100	12.9	7.5	10.1	12.5	15.7	41.3	100
4th	11.0	7.7	9.5	12.7	16.0	43.1	100	11.1	7.3	9.7	11.3	15.8	44.8	100
5th	9.5	6.2	10.5	11.0	14.5	48.2	100	9.1	6.5	9.5	12.3	14.8	47.8	100
Total	12.0	7.5	10.2	11.9	15.1	43.2	100	11.4	7.3	9.9	12.0	15.1	44.3	100

Annex Table 145 ASER: Maths learning levels by gender, 2019

Math learning outcomes (%) - children who can...														
	Female							Male						
	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total
School type														
Govt.	8.2	5.1	8.7	12.6	15.3	50.1	100	8.4	5.2	8.3	12.7	15.3	50.2	100
Privt.	13.3	9.1	9.6	11.2	14.5	42.2	100	13.0	8.7	9.4	10.8	14.8	43.3	100
Mad.	21.7	5.6	5.6	9.8	11.2	46.2	100	18.0	6.8	7.3	6.8	12.7	48.3	100
Other	11.7	5.5	11.7	11.7	16.6	42.8	100	11.4	6.0	4.8	19.9	13.3	44.6	100
Total	10.3	6.6	9.0	12.1	15	47.1	100	10.1	6.5	8.6	12.0	15.1	47.7	100
Wealth index quintile														
1st	25.9	7.5	9.8	12.8	11.7	32.2	100	23.1	8.5	10.0	12.4	10.8	35.1	100
2nd	21.1	6.4	8.1	10.1	9.0	45.3	100	21.4	6.8	8.7	10.6	9.2	43.3	100
3rd	17.6	7.7	10.7	11	13.3	39.8	100	17.5	8.2	8.8	11.2	12.7	41.5	100
4th	13.0	6.4	9.6	13.1	14.8	43.2	100	12.2	6.3	8.8	12.5	15.2	45.0	100
5th	10.5	5.5	7.5	11.6	16.0	49.0	100	10.0	5.3	7.6	11.2	15.7	50.2	100
Total	13.7	6.2	8.8	12.0	14.4	45.0	100	13.3	6.2	8.4	11.7	14.3	46.1	100
Location														
Rural	16.2	6.2	8.8	12.3	14.0	42.4	100	15.5	6.2	8.4	12.4	14.1	43.4	100
Urban	6.8	6.6	8.2	9.9	16.6	51.9	100	7.0	6.2	8.2	9.2	16.3	53.2	100
Total	14.3	6.3	8.7	11.8	14.5	44.3	100	13.8	6.2	8.4	11.8	14.5	45.3	100

E.7.2.3 Mathematics provincial comparison

The tables below provide mathematics provincial learning levels. In Punjab 17.1% of children aged 5 to 16 years are not able to carry out any mathematical operations in 2012. In the same year 52.1% (16.1% + 36%) of children are able to subtract in Punjab.

Annex Table 146 ASER: Maths learning levels by province, 2012

ASER 2012	Math learning levels (%) - children who can...					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
AJK	8.3	11.7	22.1	19.7	38.1	100
Balochistan	34.5	14.6	22.0	12.5	16.4	100
Fata	25.9	11.6	27.7	14.5	20.3	100
Gilgit-Baltistan	15.7	12.0	19.2	15.7	37.4	100
Islamabad-ICT	7.6	5.7	15.0	19.6	52.0	100
KPK	18.9	10.4	22.8	16.4	31.5	100
Punjab	17.1	10.7	20.0	16.1	36.0	100
Sindh	38.7	18.4	19.4	9.9	13.5	100
Total	24.5	12.9	21.5	14.5	26.6	100

Annex Table 147 ASER: Maths learning levels by province, 2013

ASER 2013	Math learning levels (%) - children who can...					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
AJK	6.9	11.7	20.4	20.1	41.0	100
Balochistan	25.0	19.4	25.5	12.9	17.2	100
FATA	14.9	15.1	27.1	17.2	25.8	100
Gilgit-Baltistan	13.5	13.2	23.1	19.1	31.2	100
Islamabad - ICT	13.9	8.8	21.8	26.9	28.6	100
KPK	12.9	13.8	23.9	19.5	29.9	100
Punjab	15.1	12.0	19.4	16.4	37.1	100
Sindh	29.6	18.9	20.4	13.3	17.8	100
Total	18.7	15.4	22.5	16.2	27.3	100

Annex Table 148 ASER: Maths learning levels by province, 2014

ASER 2014	Math learning levels (%) - children who can...					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
AJK	8.7	10.6	21.8	19.6	39.4	100
Balochistan	25.7	18.8	29	14.3	12.3	100
FATA	13.9	14.4	25.8	17.8	28.1	100
Gilgit-Baltistan	11.7	12.2	22.5	18.6	35	100
Islamabad - ICT	1.6	5	23.5	27.6	42.3	100
KPK	11.8	11.7	25.1	21.6	29.7	100
Punjab	14.8	11.2	20.7	17.8	35.6	100
Sindh	23.7	17.5	21.2	15.3	22.3	100
Total	17.8	14.4	23.9	17.4	26.5	100

Annex Table 149 ASER: Maths learning levels by province, 2015

ASER 2015	Math learning levels (%) - children who can...					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
AJK	7.7	7.0	18.6	18.4	48.4	100
Balochistan	24.8	19.7	25.2	13.5	16.8	100
FATA	15.3	11.6	24.8	19.7	28.6	100
Gilgit-Baltistan	14.1	8.6	20.4	19.5	37.4	100
Islamabad - ICT	4.9	7.5	14.5	16.5	56.5	100
KPK	11.5	9.3	22.7	23.5	33.1	100
Punjab	14.0	10.2	21.6	17.4	36.7	100
Sindh	24.2	15.5	21.1	17.1	22.1	100
Total	17.5	13.0	22.4	17.8	29.3	100

Annex Table 150 ASER: Maths learning levels by province, 2016

ASER 2016	Math learning levels (%) - children who can...					
	Nothing	Recognize 1-9	Recognize 10-99	Subtract	Divide	Total
AJK	5.7	4.9	13.2	14.5	61.8	100
Balochistan	35.3	16.4	22.5	11.9	13.9	100
FATA	27.8	12.9	23.1	15.4	20.7	100
Gilgit-Baltistan	25.7	8.4	16.6	17.3	32.0	100
Islamabad - ICT	10.7	10.7	23.4	20.6	34.7	100
KPK	27.4	10.2	18.1	16.5	27.7	100
Punjab	24.6	8.5	17.0	15.9	34.0	100
Sindh	31.6	17.7	22.2	15.1	13.4	100
Total	27.4	12.2	19.4	14.9	26.0	100

Annex Table 151 ASER: Maths learning levels by province, 2018

ASER 2018	Math learning outcomes (%) - children who can...						
	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total
AJK	6.0	5.2	8.1	10.9	15.6	54.2	100
Balochistan	20.2	16.5	15.7	15.1	8.5	23.9	100
FATA	20.7	7.6	10.1	12.6	17.0	31.9	100
Gilgit-Baltistan	9.8	7.1	9.8	12.1	15.2	46.1	100
Islamabad - ICT	18.4	4.7	6.8	8.6	15.7	45.8	100
KPK	11.9	6.4	9.6	13.5	19.1	39.5	100
Punjab	12.4	7.6	10.2	12.0	14.8	43.1	100
Sindh	18.9	14.4	16.0	13.9	11.4	25.4	100
Total	15.4	10.5	12.2	13.3	13.6	35.0	100

Annex Table 152 ASER: Maths learning levels by province, 2019

ASER 2019	Math learning outcomes (%)- children who can...						
	Nothing	Recognize 1-9	Recognize 10-99	Recognize 100-200	Subtract	Divide	Total
AJK	10.8	4.5	9.8	11.3	14.3	49.3	100
Balochistan	34.7	10.0	9.7	16.5	13.3	15.8	100
FATA	35.8	11.5	10.9	10.4	11.3	20.2	100
Gilgit-Baltistan	28.7	8.2	8.7	9.6	8.9	35.9	100
Islamabad - ICT	1.8	12.5	10.5	18.4	13.0	44.0	100
KPK	22.8	10.2	9.5	15.4	15.8	26.2	100
Punjab	14.1	6.2	8.5	11.8	14.5	44.9	100
Sindh	26.5	13.2	10.8	12.4	12.9	24.1	100
Total	24.8	9.4	9.6	13.2	13.4	29.7	100

E.7.3 English learning levels

E.7.3.1 Overall English learning levels

These tables provide overall English learning levels and further disaggregations by gender, disability, class level, school type, school participation (out of school children), wealth quintiles and urban/rural. In 2012, 18.9% of children aged 5 to 16 years are not able to read in English. Around 57.8% (18.2% + 39.6%) of children are able to read words in English. Furthermore, only 54% (26.3% + 27.7%) of children in primary class (grades 1-5) are able to read words in English while 94% (12.1% + 81.9%) of children in middle school (grades 6-8) are able complete the same task in 2012.

Annex Table 153 ASER: Overall English learning levels, 2012

English learning levels (%) - Children can read…						
ASER 2012	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	18.9	9.1	14.3	18.2	39.6	100
Gender						
Female	20.7	8.9	14.4	17.8	38.3	100
Male	17.6	9.2	14.2	18.5	40.5	100
Class level						
Primary	13.3	11.5	21.2	26.3	27.7	100
Middle	2.4	0.7	2.8	12.1	81.9	100
Secondary	0.0	0.0	0.3	4.3	95.4	100
School type						
Government	13.0	9.1	14.3	19.5	44.0	100
Private	11.0	10.1	17.1	19.8	42.0	100
Madrassa	42.7	11.5	12.2	13.2	20.4	100
Other	19.6	13.8	13.5	17.4	35.7	100
Participating in school						
No	69.6	5.2	7.0	7.4	10.8	100
Yes	12.8	9.5	15.2	19.5	43.1	100
Wealth index quintile						

1st (poorest)	36.9	11.2	15.2	14.6	22.0	100
2nd	26.1	11.0	15.1	17.1	30.7	100
3rd	22.0	10.2	14.9	18.6	34.3	100
4th	16.6	8.1	14.6	19.1	41.5	100
5th (richest)	12.3	8.1	13.2	18.4	48.0	100
Location						
Rural	19.2	9.2	14.3	18.1	39.1	100
Urban	9.2	5.5	12.4	19.2	53.7	100

Annex Table 154 ASER: Overall English learning levels, 2013

English learning levels (%) - Children can read….						
ASER 2013	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	17.1	9.8	13.3	18.4	41.3	100
Gender						
Male	16.8	9.6	13.5	18.4	41.7	100
Female	17.5	10.1	13.1	18.5	40.8	100
Class level						
Primary	13.4	12.3	19.2	27.0	28.1	100
Middle	2.7	2.1	3.2	11.9	80.1	100
Secondary	2.2	1.5	2.0	3.9	90.4	100
School type						
Government	13.7	9.6	13.2	18.8	44.7	100
Private	12.3	10.4	14.6	19.8	42.8	100
Madrassa	52.0	7.0	10.7	9.4	20.9	100
Other	21.7	14.7	16.9	22.2	24.5	100
Participating in school						
No	58.6	8.0	8.9	10.1	14.4	100
Yes	13.7	10.0	13.7	19.1	43.5	100
Wealth index quintile						
1st (poorest)	44.7	11.3	11.1	13.5	19.4	100
2nd	29.2	10.9	13.0	18.0	28.9	100
3rd	20.6	11.0	14.9	19.2	34.4	100
4th	14.2	10.6	14.0	19.3	41.9	100
5th (richest)	11.9	8.2	12.5	18.2	49.2	100
Location						
Rural	17.6	10.1	13.4	18.6	40.4	100
Urban	9.8	5.7	12.3	16.4	55.8	100

Annex Table 155 ASER: Overall English learning levels, 2014

English learning levels - Children can read….						
ASER 2014	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	16.3	9.5	15.5	19.5	39.2	100
Gender						
Female	17.7	9.4	15.8	19.0	38.1	100
Male	15.2	9.6	15.2	20.0	40.0	100
Class level						
Primary	11.7	12.3	22.6	28.3	25.1	100
Middle	1.7	1.8	5.1	14.2	77.1	100
Secondary	1.6	1.3	2.4	4.1	90.6	100
School type						
Government	10.3	8.9	15.7	20.4	44.7	100
Private	13.6	11.0	16.7	20.8	37.8	100
Madrassa	26.0	16.7	16.2	18.6	22.5	100
Other	19.8	9.4	13.5	18.6	38.6	100
Participating in school						
No	63.6	6.8	8.8	9.0	11.8	100
Yes	11.9	9.8	16.1	20.5	41.7	100
Wealth index quintile						
1st (poorest)	37.3	11.5	15.5	16.3	19.4	100
2nd	25.9	11.4	15.6	17.4	29.6	100
3rd	20.5	10.3	17.0	19.0	33.3	100
4th	15.5	9.7	16.2	19.7	38.8	100
5th (richest)	10.1	8.2	14.6	20.6	46.5	100
Location						
Rural	17.2	9.9	15.6	19.1	38.2	100
Urban	9.8	7.0	14.5	22.5	46.2	100

Annex Table 156 ASER: Overall English learning levels, 2015

English learning levels (%) **- Children can read….**						
ASER 2015	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	15.7	8.7	17.8	19.5	38.4	100
Gender						
Female	16.7	8.5	17.7	19.0	38.1	100
Male	14.9	8.8	17.9	19.8	38.6	100
Disability						
None	16.3	8.8	17.9	19.0	37.9	100
Mild to moderate	25.3	8.2	20.4	16.2	29.9	100
Severe	62.5	5.0	23.3	4.2	5.0	100
Class level						
Primary	11.8	10.3	25.1	28.1	24.6	100
Middle	1.4	1.0	4.5	12.8	80.3	100
Secondary	1.4	0.3	2.1	4.0	92.0	100
School type						
Government	12.7	8.7	18.1	20.1	40.5	100
Private	10.6	8.6	19.0	20.6	41.1	100
Madrassa	40.0	14.4	14.8	12.0	18.8	100
Other	23.4	9.9	22.1	19.2	25.4	100
Participating in school						
No	57.2	7.4	10.2	10.5	14.6	100
Yes	12.4	8.8	18.4	20.2	40.3	100
Wealth index quintile						
1st (poorest)	31.7	11.3	19.7	15.3	22.0	100
2nd	22.1	11.6	19.4	19.1	27.7	100
3rd	17.7	8.7	19.5	20.7	33.4	100
4th	14.5	8.7	17.4	20.1	39.3	100
5th (richest)	11.5	7.4	17.2	19.5	44.3	100
Location						
Rural	16.6	8.8	18.1	19.4	37.1	100
Urban	7.4	7.7	15.7	20.2	49.0	100

Annex Table 157 ASER: Overall English learning levels, 2016

English learning levels (%) - Children can read….						
ASER 2016	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	25.9	7.5	20.7	13.0	32.8	100
Gender						
Female	27.5	7.6	20.6	12.3	31.9	100
Male	24.6	7.4	20.8	13.6	33.6	100
Disability						
None	25.6	7.5	20.8	13.1	33.0	100
Mild to moderate	23.3	9.1	22.8	14.5	30.2	100
Severe	48.7	5.1	20.5	7.7	17.9	100
Class level						
Primary	15.0	9.7	31.1	20.6	23.5	100
Middle	8.9	1.2	8.7	7.8	73.3	100
Secondary	13.3	0.4	6.1	2.5	77.7	100
School type						
Government	16.3	7.7	22.3	14.6	39.0	100
Private	18.7	8.7	23.4	14.3	35.0	100
Madrassa	46.6	7.9	24.6	7.2	13.7	100
Other	23.1	11.6	25.1	13.1	27.0	100
Participating in school						
No	84.3	3.4	6.7	3.8	1.8	100
Yes	17.7	8.1	22.7	14.3	37.2	100
Wealth index quintile						
1st (poorest)	38.0	9.3	19.9	11.9	20.9	100
2nd	29.8	7.9	20.5	13.5	28.3	100
3rd	24.1	7.3	22.1	13.8	32.7	100
4th	23.5	7.2	21.1	13.6	34.6	100
5th (richest)	20.2	6.5	19.8	12.7	40.9	100

Annex Table 158 ASER: Overall English learning levels, 2018

English learning outcomes (%) - Children can read….						
ASER 2018	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	26.1	8.9	13.4	17.7	34.0	100
Gender						
Female	26.8	8.8	13.5	17.8	33.1	100
Male	25.5	8.9	13.2	17.6	34.7	100
Disability						
None	26.0	8.8	13.3	17.7	34.2	100
Mild to moderate	25.2	9.3	15.7	19.8	30.0	100
Severe	33.3	2.2	20.0	11.1	33.3	100
Class level						
Pre-primary	54.5	25.6	16.4	3.5	0.0	100
Primary	17.3	11.7	21.5	28.9	20.6	100
Middle	10.2	1.2	1.7	9.6	77.4	100
Secondary	9.5	0.9	0.8	2.9	85.9	100
School type						
Government	18.4	9.1	13.8	19.5	39.3	100
Private	18.7	10.6	16.8	19.9	33.9	100
Madrassa	56.7	8.7	5.7	8.2	20.6	100
Other	16.9	13.4	22.6	26.3	20.7	100
Participating in school						
No	78.7	4.4	4.7	4.1	8.1	100
Yes	18.9	9.5	14.5	19.5	37.5	100
Wealth index quintile						
1st (poorest)	37.4	11.2	15.5	15.7	20.2	100
2nd	33.1	9.9	14.4	18.1	24.5	100
3rd	28.9	8.9	13.8	17.7	30.7	100
4th	23.9	9.2	12.9	18.2	35.8	100
5th (richest)	21.4	7.6	13.0	17.9	40.0	100

Annex Table 159 ASER: Overall English learning levels, 2019

English learning outcomes (%) - Children can read….						
ASER 2019	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
Overall	16.4	6.8	11.6	18.0	47.2	100
Gender						
Female	16.7	7.1	11.6	17.5	47.1	100
Male	16.1	6.5	11.7	18.4	47.3	100
Class level						
Pre-primary	54.0	23.2	15.9	5.0	1.9	100
Primary	11.7	8.9	17.4	26.8	35.2	100
Middle	4.1	0.5	2.0	10.5	82.9	100
Secondary	5.0	0.3	1.2	4.1	89.5	100
School type						
Government	10.9	6.1	11.6	19.1	52.2	100
Private	14.6	8.8	12.6	18.3	45.6	100
Madrassa	29.1	4.1	8.4	16.3	42.1	100
Other	12.5	9.3	11.5	20.1	46.6	100
Participating in school						
No	66.7	3.6	8.3	8.0	13.4	100
Yes	12.6	7.0	11.9	18.8	49.8	100
Wealth index quintile						
1st (poorest)	28.9	7.6	12.4	15.9	35.2	100
2nd	26.1	6.3	10.5	13.2	43.9	100
3rd	20.7	7.8	12.9	16.2	42.5	100
4th	14.2	7.7	13.2	19.2	45.8	100
5th (richest)	12.0	5.7	10.5	18.5	53.3	100
Location						
Rural	18.4	7.0	12.3	17.2	45.1	100
Urban	7.9	6.1	9.1	21.4	55.5	100

E.7.3.2 English gender disaggregation

The tables in this section provide gender wise English learning levels by school type, wealth index quintiles and urban/rural. Among government schools, 62.4% (19.6% + 42.8%) of girls are able to read words in English while 64.3% (19.4% +44.9%) of boys are able to complete the same task in 2012.

Annex Table 160 ASER: English learning levels by gender, 2012

English learning levels (%) - Children can read….												
ASER 2012	**Female**						**Male**					
	Nothing	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
School type												
Govt.	13.3	9.5	14.8	19.6	42.8	100	12.8	8.9	14.0	19.4	44.9	100
Private	10.8	9.2	17.5	19.1	43.3	100	11.1	10.8	16.7	20.2	41.1	100
Madrassa	40.0	8.9	13.3	15.0	22.8	100	44.7	13.5	11.4	11.8	18.6	100
Other	17.5	17.1	12.0	16.1	37.3	100	21.8	10.2	15.2	18.8	34.0	100
Total	12.9	9.5	15.6	19.4	42.7	100	12.7	9.6	14.8	19.5	43.3	100
Wealth Index Quintile												
1st (poorest)	45.4	10.3	14.1	14.1	16.2	100	31.4	11.7	16.0	15.0	25.9	100
2nd	30.2	10.6	15.0	16.9	27.2	100	23.1	11.2	15.2	17.3	33.2	100
3rd	24.1	10.7	15.3	17.6	32.2	100	20.5	9.8	14.7	19.2	35.8	100
4th	18.3	8.0	15.2	18.7	39.8	100	15.3	8.2	14.1	19.5	42.9	100
5th (richest)	12.1	7.8	13.3	18.0	48.8	100	12.5	8.3	13.1	18.7	47.4	100
Total	20.5	8.8	14.5	17.8	38.4	100	17.4	9.2	14.2	18.5	40.8	100
Location												
Rural	21.0	9.0	14.4	17.8	37.7	100	17.9	9.3	14.3	18.4	40.1	100
Urban	10.0	5.4	14.3	17.6	52.7	100	8.5	5.5	10.8	20.6	54.6	100
Total	20.7	8.9	14.4	17.8	38.3	100	17.6	9.2	14.2	18.5	40.5	100

Annex Table 161 ASER: English learning levels by gender, 2013

English learning levels (%) - Children can read….												
ASER 2013	Female						Male					
	Nothing	Capital letters	Small letters	Words	Sentences	Total	Nothing	Capital letters	Small letters	Words	Sentences	Total
School type												
Govt.	13.8	10.1	13.3	19.0	43.8	100	13.6	9.3	13.1	18.6	45.3	100
Private	11.8	10.4	13.8	19.8	44.1	100	12.8	10.5	15.1	19.9	41.8	100
Madrassa	44.6	8.6	15.8	9.4	21.6	100	56.1	6.1	7.8	9.4	20.5	100
Other	22.3	16.2	17.3	24.1	20.1	100	20.9	13.0	16.6	20.2	29.2	100
Total	13.5	10.3	13.6	19.3	43.3	100	13.9	9.7	13.8	19.0	43.6	100
Wealth index quintiles												
1st (poorest)	47.0	12.4	10.2	12.6	17.8	100	43.4	10.7	11.6	14.1	20.3	100
2nd	32.3	10.3	12.7	16.4	28.3	100	27.2	11.2	13.2	19.1	29.4	100
3rd	20.6	10.9	15.7	19.0	33.8	100	20.5	11.0	14.3	19.4	34.9	100
4th	15.0	11.3	13.9	19.8	40.0	100	13.7	10.0	14.1	19.0	43.3	100
5th (richest)	12.2	8.3	12.1	18.4	49.0	100	11.7	8.0	12.9	18.0	49.4	100
Total	17.1	10.0	13.2	18.6	41.2	100	16.5	9.5	13.4	18.4	42.2	100
Location												
Rural	18.1	10.4	13.2	18.6	39.6	100	17.1	9.8	13.6	18.5	41.0	100
Urban	8.8	5.9	12.8	16.0	56.5	100	10.6	5.5	12.0	16.8	55.2	100
Total	17.5	10.1	13.1	18.5	40.8	100	16.8	9.6	13.5	18.4	41.7	100

Annex Table 162 ASER: English learning levels by gender, 2014

English learning levels (%) - Children can read….												
ASER 2014	Female						Male					
	Nothing	Capital letters	Small letters	Words	Sentences	Total	Nothing	Capital letters	Small letters	Words	Sentences	Total
School type												
Govt.	10.7	8.8	16.3	19.9	44.3	100	10.1	8.9	15.3	20.7	44.9	100
Private	14.2	11.0	17.1	20.5	37.2	100	13.2	11.0	16.4	21.1	38.3	100
Madrassa	27.4	11.5	20.4	15.3	25.5	100	25.0	20.7	13.0	21.2	20.2	100
Other	22.5	8.5	11.4	22.0	35.6	100	17.5	10.2	15.3	15.7	41.2	100
Total	12.4	9.7	16.6	20.1	41.2	100	11.5	9.9	15.7	20.8	42.1	100
Wealth index quintiles												
1st (poorest)	42.7	11.7	14.0	15.4	16.3	100	33.7	11.3	16.5	17.0	21.5	100
2nd	29.5	10.8	16.4	16.1	27.2	100	23.4	11.9	15.1	18.4	31.2	100
3rd	23.9	10.1	16.7	17.9	31.3	100	17.9	10.4	17.1	19.8	34.8	100
4th	16.8	9.6	16.4	18.8	38.3	100	14.5	9.8	16.0	20.5	39.2	100
5th (richest)	10.8	8.3	15.0	20.6	45.4	100	9.7	8.2	14.2	20.6	47.4	100
Total	17.8	9.3	15.7	18.9	38.2	100	15.1	9.6	15.2	20.0	40.1	100
Location												
Rural	18.8	9.7	15.9	18.6	37.0	100	16.0	10.0	15.4	19.5	39.1	100
Urban	10.5	7.2	15.0	21.5	45.7	100	9.3	6.9	14.0	23.2	46.6	100
Total	17.7	9.4	15.8	19.0	38.1	100	15.2	9.6	15.2	20.0	40.0	100

Annex Table 163 ASER: English learning levels by gender, 2015

English learning levels (%) - Children can read….												
ASER 2015	Female						Male					
	Nothing	Capital letters	Small letters	Words	Sentences	Total	Nothing	Capital letters	Small letters	Words	Sentences	Total
School type												
Govt.	13.0	8.6	18.2	20.1	40.1	100	12.5	8.7	18.0	20.1	40.7	100
Private	10.4	8.4	18.9	19.9	42.5	100	10.8	8.8	19.2	21.1	40.1	100
Madrassa	38.9	13.0	14.5	13.0	20.7	100	40.8	15.5	15.1	11.3	17.4	100
Other	18.9	7.2	25.7	21.3	26.9	100	27.0	12.1	19.2	17.6	24.1	100
Total	12.4	8.6	18.5	19.9	40.6	100	12.4	8.9	18.4	20.3	40.0	100
Wealth index quintiles												
1st (poorest)	33.4	10.6	20.8	16.3	19.0	100	30.5	11.8	19.0	14.6	24.0	100
2nd	25.5	11.6	18.7	18.7	25.5	100	19.7	11.7	19.9	19.4	29.3	100
3rd	19.8	8.4	19.8	19.9	32.1	100	16.2	8.9	19.3	21.3	34.2	100
4th	15.8	8.8	16.9	20.1	38.5	100	13.6	8.6	17.8	20.1	40.0	100
5th (richest)	11.6	7.3	17.2	18.7	45.1	100	11.4	7.5	17.2	20.1	43.7	100
Total	16.3	8.5	17.8	19.1	38.3	100	14.6	8.7	18.0	19.9	38.8	100
Location												
Rural	17.9	8.7	18.0	19.0	36.5	100	15.8	8.8	18.2	19.7	37.5	100
Urban	7.4	7.0	15.9	19.3	50.4	100	7.3	8.2	15.5	21.0	47.9	100
Total	16.7	8.5	17.7	19.0	38.1	100	14.9	8.8	17.9	19.8	38.6	100

Annex Table 164 ASER: English learning levels by gender, 2016

English learning levels (%) - Children can read….												
ASER 2016	Female						Male					
	Nothing	Capital letters	Small letters	Words	Sentences	Total	Nothing	Capital letters	Small letters	Words	Sentences	Total
School type												
Govt.	16.7	7.9	22.5	14.0	38.9	100	16.1	7.6	22.2	15.0	39.1	100
Private	19.2	8.7	23.5	13.9	34.7	100	18.3	8.6	23.3	14.6	35.3	100
Madrassa	42.6	10.2	25.1	8.1	14.0	100	49.4	6.3	24.3	6.6	13.5	100
Other	21.9	11.7	25.8	11.7	28.9	100	24.2	11.6	24.5	14.4	25.3	100
Total	17.9	8.3	22.9	13.9	37.1	100	17.3	7.9	22.6	14.7	37.4	100
Wealth index quintiles												
1st (poorest)	43.1	10.1	19.3	10.2	17.3	100	34.0	8.7	20.3	13.2	23.8	100
2nd	31.1	8.4	20.7	12.7	27.1	100	28.8	7.6	20.3	14.2	29.1	100
3rd	26.1	7.4	22.2	13.2	31.1	100	22.6	7.3	21.9	14.2	33.9	100
4th	24.5	7.4	21.2	13.2	33.7	100	22.8	7.0	21.1	13.8	35.3	100
5th (richest)	20.3	6.2	19.5	12.3	41.8	100	20.1	6.7	20.0	13.0	40.2	100
Total	27.6	7.6	20.5	12.3	32.0	100	24.7	7.4	20.7	13.6	33.6	100

Annex Table 165 ASER: English learning levels by gender, 2018

English learning outcomes (%) - Children can read….												
ASER 2018	**Female**						**Male**					
	Nothing	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**	**Nothing**	**Capital letters**	**Small letters**	**Words**	**Sentences**	**Total**
School type												
Government	18.2	9.0	14.2	20.0	38.5	100	18.4	9.1	13.4	19.1	39.9	100
Private	19.2	10.1	17.0	20.0	33.7	100	18.4	11.0	16.7	19.9	34.1	100
Madrassa	58.2	9.8	2.0	9.8	20.3	100	55.8	8.0	8.0	7.2	20.9	100
Other	18.5	13.9	22.0	25.4	20.2	100	15.6	13.1	23.1	27.1	21.1	100
Total	18.8	9.4	14.9	20.0	36.9	100	18.8	9.6	14.3	19.2	38.1	100
Wealth index quintile												
1st (poorest)	40.8	11.5	14.8	14.6	18.3	100	34.7	11	16.1	16.6	21.6	100
2nd	33.9	10.1	14.3	18.0	23.6	100	32.4	9.7	14.6	18.1	25.2	100
3rd	30.9	9.1	14.3	17.4	28.4	100	27.3	8.8	13.5	18.0	32.4	100
4th	24.4	9.2	13.4	18.8	34.2	100	23.4	9.3	12.5	17.7	37.1	100
5th (richest)	21.6	7.4	13.0	18.2	39.8	100	21.3	7.8	13.1	17.7	40.2	100
Total	25.8	8.7	13.5	18.1	33.8	100	24.5	8.8	13.2	17.7	35.8	100

Annex Table 166 ASER: English learning levels by gender, 2019

English learning outcomes (%) - Children can read….												
ASER 2019	Female						Male					
	Nothing	Capital letters	Small letters	Words	Sentences	Total	Nothing	Capital letters	Small letters	Words	Sentences	Total
School type												
Government	10.9	6.4	11.6	18.7	52.4	100	11.0	5.9	11.7	19.4	52.0	100
Private	14.8	9.3	12.6	17.5	45.7	100	14.5	8.5	12.6	18.9	45.5	100
Madrassa	32.7	2.6	7.8	15.7	41.2	100	26.5	5.1	8.8	16.7	42.8	100
Other	13.7	5.5	15.1	18.5	47.3	100	11.4	12.6	8.4	21.6	46.1	100
Total	12.5	7.5	12.0	18.3	49.8	100	12.3	6.8	12.0	19.3	49.6	100
Wealth index quintile												
1st (poorest)	30.8	7.1	11.5	14.8	35.8	100	27.3	8.0	13.2	16.7	34.7	100
2nd	25.2	6.0	10.7	12.1	46.0	100	26.8	6.5	10.4	13.9	42.3	100
3rd	20.8	8.7	12.6	15.6	42.4	100	20.6	7.1	13.1	16.6	42.6	100
4th	14.8	8.3	13.0	18.8	45.1	100	13.6	7.2	13.3	19.5	46.4	100
5th (richest)	12.3	6.0	10.5	18.4	52.8	100	11.7	5.5	10.5	18.5	53.7	100
Total	16.0	7.2	11.7	17.5	47.5	100	15.5	6.5	11.9	18.1	47.9	100
Location												
Rural	18.9	7.3	12.1	16.7	45.0	100	18.1	6.7	12.4	17.5	45.3	100
Urban	7.9	6.5	9.4	20.7	55.5	100	7.9	5.7	8.9	21.9	55.6	100
Total	16.7	7.1	11.6	17.5	47.1	100	16.1	6.5	11.7	18.4	47.3	100

E.7.3.3 English provincial comparison

The tables below provide provincial English learning levels. In Punjab 18.9% of children aged 5 to 16 years are not able to read in English in 2012. In the same year 57.8% (18.2% + 39.6%) of children are able to read words in English in Punjab.

Annex Table 167 ASER: English learning levels by province, 2012

ASER 2012	English learning levels (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	8.2	9.3	16.3	20.9	45.2	100
Balochistan	38.9	13.1	17.0	14.8	16.2	100
FATA	30.0	10.3	18.2	19.0	22.5	100
Gilgit-Baltistan	16.6	9.6	12.5	17.3	44.0	100
Islamabad-ICT	8.0	4.8	8.4	21.7	57.1	100
KPK	20.5	9.1	16.9	20.1	33.4	100
Punjab	18.9	9.1	14.3	18.2	39.6	100
Sindh	47.9	13.9	12.7	10.6	14.9	100
Total	28.0	10.8	15.3	16.8	29.0	100

Annex Table 168 ASER: English learning levels by province, 2013

ASER 2013	English learning levels (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	7.1	9.6	15.6	22.0	45.7	100
Balochistan	39.8	15.4	16.4	12.0	16.4	100
FATA	20.6	13.5	19.9	24.0	22.0	100
Gilgit-Baltistan	14.8	11.3	15.2	21.0	37.7	100
Islamabad - ICT	14.9	6.3	17.4	22.7	38.7	100
KPK	14.8	12.3	17.4	24.8	30.7	100
Punjab	17.1	9.8	13.3	18.4	41.3	100
Sindh	38.7	14.4	11.8	15.2	19.9	100
Total	24.8	12.6	15.2	18.4	29.1	100

Annex Table 169 ASER: English learning levels by province, 2014

ASER 2014	English learning levels (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	8.4	9.6	15.4	22.3	44.3	100
Balochistan	34.7	17.3	17.7	16.6	13.8	100
FATA	17.5	13.0	19.1	24.2	26.2	100
Gilgit-Baltistan	13.5	10.0	15.9	20.8	39.8	100
Islamabad - ICT	1.9	9.1	11.9	29.6	47.5	100
KPK	13.6	11.4	18.4	25.2	31.4	100
Punjab	16.3	9.5	15.5	19.5	39.2	100
Sindh	32.0	15.2	13.8	15.5	23.5	100
Total	22.4	13	16.4	19.7	28.6	100

Annex Table 170 ASER: English learning levels by province, 2015

ASER 2015	English learning levels (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	7.8	7.0	13.5	19.9	51.8	100
Balochistan	31.8	18.4	19.7	13.7	16.4	100
FATA	18.8	11.1	19.4	25.1	25.7	100
Gilgit-Baltistan	14.8	7.0	16.7	20.6	40.9	100
Islamabad - ICT	4.6	6.8	11.4	16.5	60.7	100
KPK	12.3	9.2	18.4	25.2	34.9	100
Punjab	15.7	8.7	17.8	19.5	38.4	100
Sindh	32.4	13.1	14.4	17.7	22.4	100
Total	21.4	11.7	17.5	19.3	30.1	100

Annex Table 171 ASER: English learning levels by province, 2016

ASER 2016	English learning levels (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	6.3	5.4	18.1	7.9	62.3	100
Balochistan	41.1	15.9	18.2	10.9	13.9	100
FATA	30.9	13.1	22.0	15.0	19.0	100
Gilgit-Baltistan	27.5	6.4	19.6	13.7	32.8	100
Islamabad - ICT	13.5	8.3	23.9	18.0	36.3	100
KPK	27.5	9.6	22.6	13.5	26.8	100
Punjab	25.9	7.5	20.7	13.0	32.8	100
Sindh	39.6	17.7	19.6	11.6	11.5	100
Total	30.8	11.6	20.1	12.2	25.3	100

Annex Table 172 ASER: English learning levels by province, 2018

ASER 2018	English learning outcomes (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	17.1	4.9	10.7	14.5	52.8	100
Balochistan	46.1	17.4	15.0	11.5	9.9	100
FATA	44.9	9.7	10.8	19.0	15.5	100
Gilgit-Baltistan	25.1	6.7	14.7	16.9	36.7	100
Islamabad - ICT	33.8	3.9	7.2	15.9	39.2	100
KPK	28.7	8.6	13.4	20.6	28.6	100
Punjab	26.1	8.9	13.4	17.7	34.0	100
Sindh	34.7	14.7	16.1	18.4	16.0	100
Total	34.1	11.6	13.9	16.4	24.0	100

Annex Table 173 ASER: English learning levels by province, 2019

ASER 2019	English learning outcomes (%) - Children can read….					
	Nothing	Capital letters	Small letters	Words	Sentences	Total
AJK	11.6	4.4	14.1	16.1	53.7	100
Balochistan	40.8	11.9	16.2	13.8	17.3	100
FATA	38.2	13.1	16.2	20.0	12.5	100
Gilgit-Baltistan	31.6	9.1	12.6	15.2	31.5	100
Islamabad - ICT	6.5	9.2	16.8	20.7	46.8	100
KPK	26.4	8.7	12.0	21.2	31.7	100
Punjab	16.4	6.8	11.6	18.0	47.2	100
Sindh	32.5	15.2	11.6	14.7	26.0	100
Total	28.8	10.2	13.3	16.8	30.9	100

E.8 Student attendance

The ASER school observation sheet records the headcount of student enrolment, according to school registers, and a headcount of students present on the day of the survey, as observed by the enumerator. The student attendance indicator has been calculated through the following formula:

Student attendance = (headcount of present students / headcount of enrolled students)*100

The tables in this section present overall student attendance over various groups, student attendance by province and results of group wise t-tests. The table below provides the mean percentage and number of observations over school type, school level, school gender and location in Punjab, along with a provincial comparison. In 2012 the average student attendance is 85.2% in Punjab. The remainder of the table provides attendance means over various groups – for instance, student attendance is 86.7% in high schools in comparison to 83.6% in primary schools.

Annex Table 174 ASER: Student attendance

	2012		2013		2014		2015		2016		2018		2019	
	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs
Overall	85.2	1852	83.7	1777	88.0	1913	89.7	1948	86.3	1701	91.4	1422	91.3	1827
School type														
Government	85.2	1111	87.6	1116	88.0	1117	90.2	1205	88.2	1020	92.0	942	91.2	1179
Private	85.1	741	77	661	88.1	796	88.8	743	83.4	681	90.1	480	91.5	648
School level														
Primary	83.6	627	84.5	565	87.5	690	89.5	713	87.3	643	91.1	697	91.2	815
Secondary	85.5	661	82.7	623	88.4	648	89.5	655	84.8	576	91.2	351	90.9	397
High	86.7	499	83.4	522	88.1	528	90.1	534	86.4	450	92.1	332	91.7	547
Other					88.8	47	91.0	45	91.9	32	94.8	38	91.2	68
School gender														
Boys	84.9	895	87.8	618	88.5	491	88.8	1033	89	495	90.8	720	91.3	963
Girls	86.8	601	85.3	320	87	400	90.8	579	87.9	235	92.3	418	91.3	438
Mixed	83.1	356	80	839	88.2	1022	90.3	335	84.5	970	91.5	284	91.3	425
Location														

Rural	85.1	1742	83.4	1648	88	1654	89.6	1723					90.8	1481
Urban	86.1	110	86.7	129	88.4	259	90.3	225					93.3	346
Note: Observations with student attendance greater than 100% have been dropped from the analysis.														

Annex Table 175 ASER: Student attendance by province

	2012		2013		2014		2015		2016		2018		2019	
	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs
AJK	86.3	543	87.2	514	86.3	517	88.9	575	88.6	584	89.5	532	91.3	549
Balochistan	76.5	898	79.2	779	79.5	961	82.7	1018	72.1	987	81.3	1007	78.3	1029
FATA	80.4	306	83.2	303	86.9	312	84.9	365	80.7	325	79.2	397	82.6	365
GB	84.9	335	86.2	344	85.3	349	86.0	328	87.7	330	91.7	444	91.1	598
Islamabad	90.2	45	88.1	51	91.8	79	89.1	32	41.3	20	87.9	35	91.3	41
KPK	84.6	1073	84.6	1087	85.2	1104	88.2	1144	81.1	848	88.1	790	87.4	1152
Punjab	85.2	1852	83.7	1777	88.0	1913	89.7	1948	86.3	1701	91.4	1422	91.3	1827
Sindh	62.9	804	68.7	938	73.3	1000	74.4	1029	66.7	745	67.5	674	76.5	889
Total	80.6	5856	81.3	5793	83.5	6235	85.3	6439	80.2	5540	84.8	5301	86.0	6450
Note: Observations with student attendance greater than 100% have been dropped from the analysis.														

Annex Table 176 ASER: Student attendance, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	0.178	10.543***	-0.187	1.375**	4.739***	1.875***	-0.348
School level							
diff. (Primary)-(Secondary)	-1.923*	1.832*	-0.899	-0.002	2.531*	-0.152	0.321
diff. (Primary)-(High)	-3.110***	1.136	-0.569	-0.6	0.927	-1.048	-0.55
diff. (Secondary)-(High)	-1.187	-0.696	0.329	-0.598	-1.603	-0.896	-0.871
School gender							
diff. (Boys)-(Girls)	-1.883*	2.551**	1.51	-1.955***	1.218	-1.426**	-0.086
diff. (Boys)-(Mixed)	1.767	-7.870***	0.238	-1.332*	4.437***	-0.672	0.055
diff. (Girls)-(Mixed)	3.650***	-5.319***	-1.272	0.623	3.218*	0.754	0.14

School location							
diff. (Rural)-(Urban)	-0.979	-3.335*	-0.894	-0.643			-2.497***
Province/region							
diff. (Punjab)-(Sindh)	22.256***	14.935***	14.759***	15.272***	19.624***	23.904***	14.811***
diff. (Punjab)-(BL)	8.635***	-4.414***	-8.546***	-6.947***	-14.183***	10.105***	-12.976***
diff. (Punjab)-(KP)	0.533	0.944	-2.816***	-1.488***	-5.149***	3.272***	-3.893***
diff. (Punjab)-(GB)	0.249	2.573**	-2.776***	-3.667***	1.472	-0.363	-0.181
diff. (Punjab)-(AJK)	-1.157	3.521***	-1.777**	-0.796	2.294**	1.905***	0.045
diff. (Punjab)-(ICT)	-4.998*	4.401	3.806**	-0.609	-45.011***	3.499*	0.048
diff. (Punjab)-(FATA)	4.727***	-0.462	-1.121	-4.721***	-5.554***	12.155***	-8.714***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 177 ASER: Student attendance, significance over time

	diff. (2012)-(2019)
Overall	-6.118***
School type	
Government	-5.923***
Private	-6.449***
School level	
Primary	-7.582***
Secondary	-5.337***
High	-5.022***
School gender	
Boys	-6.380***
Girls	-4.583***
Mixed	-8.092***
Location	
Rural	-5.687***
Urban	-7.205***

*p<0.05, **p<0.01, ***p<0.001

E.9 Teacher attendance

The ASER school observation sheet records number of appointed teachers and number of teachers that are present on the day of the survey, as observed by the enumerator. Teachers here include head teachers, regular teachers and community/part-time/contract teachers. The teacher attendance indicator has been calculated through the following formula:

Teacher attendance = (headcount of present teachers / headcount of appointed teachers)*100

The tables in this section present overall teacher attendance over various groups, teacher attendance by province and results of group wise t-tests. The tables below provide the mean percentages and number of observations over school type, school level, school gender and location in Punjab. For instance in 2012 the average teacher attendance in Punjab is 86%. Furthermore, teacher attendance is higher at 85.2% in government schools than 87.3% in private school in 2012.

Annex Table 178 ASER: Teacher attendance

	2012		2013		2014		2015		2016		2018		2019	
	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs
Overall	86.0	1836	88.4	1236	92.3	1913	92.2	1948	88.7	1701	88.3	1209	87.9	1518
School type														
Government	85.2	1095	88.2	1119	92.3	1117	92.1	1205	87.3	1020	84.9	792	89.1	883
Private	87.3	741	90.4	117	92.3	796	92.4	743	90.9	681	94.8	417	86.2	635
School level														
Primary	85.6	624	87.3	468	92.6	690	91.7	713	87.0	643	87.1	21	87.4	762
Secondary	86.4	651	88.2	325	91.9	648	92.7	655	90.2	576	87.3	650	88.8	333
High	86.1	496	89.9	388	92.1	528	92.2	534	89.3	450	90.5	281	88.4	380
Other					93.9	47	95.1	45	88.3	32	84.9	792	86.8	43
School gender														
Boys	86.3	890	89.3	596	93.2	491	91.8	1033	86.9	495	89.0	629	86.4	887
Girls	86.3	594	86.4	296	92	400	93.3	579	89.9	235	87.8	347	91.7	325
Mixed	85	352	88.6	344	91.9	1022	91.6	335	89.3	970	87.0	233	88.6	305
Location														

Rural	85.6	1727	88.4	1156	92.4	1654	92.1	1723					88.1	1162
Urban	92.9	109	89.0	80	91.5	259	93.4	225					87.2	356
Note: Observations with teacher attendance greater than 100% have been dropped from the analysis.														

Annex Table 179 ASER: Teacher attendance by province

	2012		2013		2014		2015		2016		2018		2019	
	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs	Mean (%)	Obs
AJK	84.9	525	88.7	407	89.3	517	91.2	575	90.6	584	90.5	447	93.0	532
Balochistan	89.1	894	88.5	728	86.5	961	91.8	1018	88.6	987	90.0	888	93.7	912
FATA	88.2	292	87.1	249	91.3	312	89.4	365	91.0	325	84.8	337	91.6	267
Gilgit-Baltistan	85.7	333	88.9	247	88.9	349	90.8	328	90.6	330	90.6	345	88.0	574
Islamabad-ICT	90.3	46	90.3	35	90.4	79	88.7	32	70.1	20	84.0	30	63.7	35
KPK	86.0	1046	87.3	800	88.0	1104	92.8	1144	87.0	848	89.3	697	86.6	885
Punjab	86.0	1836	88.4	1236	92.3	1913	92.2	1948	88.7	1701	88.3	1209	87.9	1518
Sindh	81.5	770	84.4	766	88.2	1000	90.6	1029	87.6	745	85.3	630	84.8	699
Total	85.9	5742	87.5	4468	89.5	6235	91.6	6439	88.7	5540	88.5	4583	88.8	5422
Note: Observations with teacher attendance greater than 100% have been dropped from the analysis.														

Annex Table 180 ASER: Teacher attendance, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	-2.052	-2.193	-0.016	-0.277	-3.575**	-9.953***	2.935*
School level							
diff. (Primary)-(Secondary)	-0.808	-0.901	0.72	-1.011	-3.220*	-3.201	-1.426
diff. (Primary)-(High)	-0.455	-2.642	0.498	-0.546	-2.378	-0.844	-1
diff. (Secondary)-(High)	0.353	-1.742	-0.223	0.465	0.842	2.357	0.425
School gender							
diff. (Boys)-(Girls)	0.005	2.929*	1.183	-1.381	-2.813	1.73	-4.743**
diff. (Boys)-(Mixed)	1.31	-0.677	1.193	0.39	-2.357	1.863	-1.827
diff. (Girls)-(Mixed)	1.305	2.252	0.01	1.77	0.456	0.133	2.916

School location							
diff. (Rural)-(Urban)	-7.270**	-0.631	0.951	-1.191			0.963
Province/region							
diff. (Punjab)-(Sindh)	4.561***	3.975***	4.073***	1.675**	1.159	2.984*	3.083**
diff. (Punjab)-(BL)	-3.095***	0.117	-5.734***	-0.483	-0.097	-1.718	5.835***
diff. (Punjab)-(KP)	-0.015	-1.143	-4.313***	0.547	-1.677	-1.027	-1.346
diff. (Punjab)-(GB)	0.378	0.509	-3.388***	-1.483	1.887	-2.348	0.089
diff. (Punjab)-(AJK)	1.136	0.343	-3.008***	-1.004	1.917	-2.213	5.117***
diff. (Punjab)-(ICT)	-4.244	1.859	-1.875	-3.527	-18.659***	4.265	-24.194***
diff. (Punjab)-(FATA)	-2.126	-1.275	-0.941	-2.819**	2.247	3.486*	3.726*

*p<0.05, **p<0.01, ***p<0.001

Annex Table 181 ASER: Teacher attendance, significance over time

	diff. (2012)-(2019)
Overall	-1.872*
School type	
Government	-3.928***
Private	1.059
School level	
Primary	-1.758
Secondary	-2.376
High	-2.303
School gender	
Boys	-0.34
Girls	-5.088***
Mixed	-3.477
Location	
Rural	-2.569**
Urban	5.664*

*p<0.05, **p<0.01, ***p<0.001

E.10 Teacher qualifications

The ASER school observation sheet records the number of qualified teacher staff by the following type of qualifications:

Annex Table 182 ASER: Educational and professional qualifications

Educational Qualifications	Professional Qualifications
Below matric (2014 onwards)	None (2014 onwards)
Matric	CT
Inter	PTC
Graduate	B.Ed
Postgraduate	M.Ed
Other	Other

E.10.1 Overall teacher qualifications

The tables below provide the percentage distribution of teacher type in the sample, by category. For instance, under the matric column, the following formula has been used:

% of teachers with matric qualification = (total number of teachers with matric qualification / total number of educational qualified teachers)*100

This means that in 2012 the majority of teachers have either a graduate (33.3%) or masters (30.7%) qualification in Punjab. Furthermore, a comparison between school type shows that the largest portion of teachers in government schools have a Master's degree (39.7%) while the largest portion of teachers in private schools have a graduate degree (38.8%).

Annex Table 183 ASER: Qualified teaching staff (% distribution), 2012

	Educational Qualification						Professional Qualification				
	Matric	Inter	Graduate	Master	Postgraduate	Other	CT	PTC	B.Ed	M.Ed	Other
Overall	14.7	19.7	33.3	30.7	1.0	0.6	12.1	22.4	43.8	18.0	3.7
School type											
Government	15.5	13.2	29.7	39.7	1.2	0.6	13.0	25.0	39.2	19.3	3.5
Private	13.5	29.7	38.8	16.8	0.5	0.6	8.4	11.6	62.9	12.8	4.4
School level											
Primary	27.8	21.8	30.0	20.0	0.3	0.0	12.7	42.4	32.7	11.5	0.6
Secondary	14.9	23.5	34.4	26.0	0.6	0.6	11.6	21.5	49.0	14.4	3.6
High	11.8	16.6	33.6	35.8	1.3	0.8	11.7	18.8	43.8	21.0	4.6
School gender											
Boys	14.7	26.9	37.1	20.2	0.6	0.6	9.5	19.5	54.2	13.3	3.5
Girls	14.2	12.7	31.1	40.2	1.1	0.7	13.7	21.4	41.2	19.3	4.4
Mixed	15.5	16.6	29.2	36.7	1.4	0.6	12.0	26.9	37.8	20.6	2.8
Location											
Rural	15.1	19.9	33.3	30.3	0.7	0.6	11.9	22.6	44.6	17.1	3.8
Urban	11.7	17.7	33.1	34.2	2.8	0.5	13.3	21.1	37.3	25.6	2.7
Province/region											
Punjab	14.7	19.7	33.3	30.7	1.0	0.6	12.1	22.4	43.8	18.0	3.7
Sindh	6.0	20.5	39.1	32.9	0.7	0.9	9.4	31.3	30.2	26.4	2.7
Balochistan	14.8	30.7	33.7	19.3	0.3	1.3	14.4	38.0	33.1	11.9	2.7
KPK	7.7	20.6	34.2	35.6	0.8	1.0	22.9	32.6	28.3	12.0	4.3
Gilgit-Baltistan	11.0	23.2	41.7	22.6	0.7	0.8	23.9	11.2	54.8	8.3	1.9
AJK	11.2	25.8	41.1	20.8	0.4	0.7	24.0	21.0	43.1	9.2	2.7
Islamabad-ICT	1.1	2.4	57.5	36.5	2.3	0.3	3.6	3.2	48.5	44.7	0.0
FATA	18.1	27.3	28.6	24.7	0.1	1.3	19.3	43.7	21.9	7.4	7.8
Total	12.0	22.1	35.5	28.9	0.7	0.8	16.5	27.2	37.6	15.2	3.5

Annex Table 184 ASER: Qualified teaching staff (% distribution), 2013

	Educational Qualification						Professional Qualification				
	Matric	Inter	Graduate	Master	Postgraduate	Other	CT	PTC	B.Ed	M.Ed	Other
Overall	12.8	18.0	34.7	32.8	1.2	0.5	10.0	19.1	46.5	20.5	3.8
School type											
Government	13.1	11.5	31.9	41.5	1.6	0.4	11.1	21.8	41.9	22.1	3.1
Private	12.4	28.3	39.2	18.9	0.7	0.6	5.7	8.9	64.4	14.3	6.7
School level											
Primary	23.3	20.8	33.0	22.3	0.3	0.2	9.5	38.3	37.7	13.1	1.4
Secondary	14.1	23.1	36.8	24.9	0.7	0.4	8.3	19.4	52.0	15.8	4.5
High	10.2	14.9	34.4	38.4	1.7	0.5	11.2	16.2	45.1	23.3	4.2
School gender											
Mixed	13.8	26.0	37.0	22.0	0.6	0.5	7.8	17.4	54.6	15.5	4.6
Boys	11.0	10.9	32.8	42.7	2.0	0.5	10.5	17.9	44.8	22.3	4.5
Girls	14.1	14.4	33.2	36.9	1.1	0.3	11.7	23.7	40.3	22.9	1.5
Location											
Rural	13.2	18.6	33.7	32.8	1.3	0.4	10.0	18.8	47.0	20.4	3.8
Urban	10.2	13.8	41.4	32.6	1.2	0.8	10.2	21.3	43.4	21.2	3.9
Province/region											
AJK	8.2	22.8	44.6	23.3	0.4	0.7	20.7	18.7	47.6	9.5	3.5
Balochistan	17.1	28.4	34.7	18.8	0.2	0.8	16.7	39.7	28.2	12.0	3.4
FATA	13.2	26.2	27.2	28.9	0.5	4.0	13.8	38.0	26.6	10.8	10.8
Gilgit-Baltistan	6.7	20.2	46.5	26.3	0.1	0.2	19.6	10.6	56.4	10.2	3.2
Islamabad - ICT	5.6	13.6	39.8	38.8	2.3	0.0	8.4	11.8	50.4	22.9	6.5
KPK	5.8	16.5	31.2	43.5	1.1	2.0	18.3	23.9	34.5	14.7	8.5
Punjab	12.8	18.0	34.7	32.8	1.2	0.5	10.0	19.1	46.5	20.5	3.8
Sindh	6.4	19.2	41.7	30.8	0.6	1.3	8.1	27.7	39.6	22.1	2.5
Total	10.3	19.8	36.4	31.7	0.9	1.0	14.1	23.4	41.2	16.5	4.9

Annex Table 185 ASER: Qualified teaching staff (% distribution), 2014

	Educational Qualification							Professional Qualification					
	Below Matric	Matric	Inter	Graduate	Master	Post-graduate	Other	None	CT	PTC	B.Ed	M.Ed	Other
Overall	0.4	12.4	18.3	33.1	34.0	1.4	0.5	11.2	14.6	9.7	41.8	19.9	2.7
School type													
Government	0.3	12.7	11.6	29.4	43.3	2.1	0.6	3.4	18.5	12.1	40.1	23.5	2.5
Private	0.6	11.9	28.0	38.5	20.3	0.4	0.4	30.7	5.1	3.7	46.1	11.1	3.3
School level													
Primary	0.5	21.2	22.1	32.5	21.9	0.8	0.8	9.3	30.0	10.5	35.4	13.6	1.2
Secondary	0.4	12.7	21.1	35.4	29.6	0.4	0.4	15.2	12.3	8.1	45.1	17.0	2.4
High	0.4	10.1	16.5	33.0	37.7	1.8	0.5	10.7	12.9	10.6	41.1	21.2	3.5
Other	0.0	4.3	5.6	20.9	63.7	5.2	0.3	1.2	4.1	7.8	46.3	38.6	1.9
School gender													
Mixed	0.4	13.6	25.1	36.1	23.6	0.6	0.5	21.4	12.3	5.9	43.6	13.7	3.1
Boys	0.5	9.6	11.7	31.3	44.5	2.0	0.3	4.9	13.7	12.6	43.0	23.3	2.6
Girls	0.2	13.3	12.8	29.2	41.8	2.0	0.7	5.0	19.2	11.2	37.8	24.5	2.4
Location													
Rural	0.4	13.0	18.6	32.7	33.5	1.1	0.6	11.8	15.2	9.8	41.4	19.0	2.7
Urban	0.2	9.6	17.1	34.5	36.1	2.4	0.0	8.9	12.1	8.9	43.3	24.1	2.6
Province/region													
AJK	0.3	8.3	23.2	42.4	23.7	0.6	1.6	6.0	18.5	17.4	44.2	11.0	3.0
Balochistan	0.3	15.5	23.7	34.1	24.3	0.2	2.0	12.1	30.8	16.3	26.8	9.8	4.3
FATA	0.9	8.5	22.5	35.1	30.2	1.0	1.7	4.7	31.2	22.0	26.5	8.2	7.4
Gilgit-Baltistan	0.3	5.8	20.3	46.5	26.3	0.3	0.5	16.1	10.5	13.5	49.0	10.1	0.8
Islamabad - ICT	0.3	3.3	8.0	42.5	42.5	2.7	0.7	1.0	5.2	3.0	54.9	34.4	1.3
KPK	0.6	5.4	16.3	31.7	43.3	1.2	1.4	6.9	19.4	21.1	31.9	14.1	6.6
Punjab	0.4	12.4	18.3	33.1	34.0	1.4	0.5	11.2	14.6	9.7	41.8	19.9	2.7
Sindh	0.2	5.2	21.9	43.3	27.1	0.6	1.5	11.2	20.7	9.1	33.0	22.0	4.0
Total	0.4	9.5	19.5	36.1	32.3	1.0	1.1	10.0	19.2	14.2	36.9	15.8	3.9

Annex Table 186 ASER: Qualified teaching staff (% distribution), 2015

	Educational Qualification							Professional Qualification					
	Below matric	Matric	Inter	Graduate	Master	Post-graduate	Other	None	CT	PTC	B.Ed	M.Ed	Other
Overall	0.3	10.4	16.1	31.9	37.7	2.5	1.1	18.7	11.5	7.8	39.6	19.2	3.2
School type													
Government	0.2	9.9	9.2	28.4	48.0	3.1	1.2	4.9	15.2	9.1	43.2	24.3	3.2
Private	0.5	11.2	27.3	37.7	21.1	1.4	0.8	46.4	4.0	5.1	32.5	8.7	3.2
School level													
Primary	0.3	18.2	18.4	31.8	28.9	1.9	0.5	15.2	24.6	9.0	34.6	15.5	1.2
Secondary	0.3	11.0	21.1	33.4	31.7	1.6	0.9	27.7	9.1	7.3	37.4	15.3	3.2
High	0.3	8.2	12.8	31.6	42.7	3.0	1.4	15.0	9.8	7.9	42.1	21.6	3.6
Other	0.3	2.1	5.0	22.7	63.8	5.4	0.7	3.6	1.1	5.7	47.8	36.0	5.9
School gender													
Boys	0.4	12.8	23.9	35.5	25.6	1.3	0.6	36.4	9.4	6.0	33.9	11.4	2.8
Girls	0.2	7.7	9.0	29.6	48.1	3.7	1.7	5.8	11.7	9.2	45.0	24.1	4.2
Mixed	0.3	10.1	11.9	28.3	45.7	2.8	0.8	7.5	15.2	8.7	41.1	25.3	2.2
Location													
Rural	0.3	10.8	16.3	31.7	37.5	2.4	0.9	19.5	11.1	8.0	39.2	18.8	3.3
Urban	0.2	8.4	15.2	33.2	38.6	2.7	1.7	13.7	14.0	6.5	42.0	21.0	2.8
Province/region													
AJK	0.0	4.9	21.0	45.4	26.7	0.6	1.2	8.5	9.7	19.1	45.9	13.2	3.6
Balochistan	0.3	11.0	29.8	38.0	18.9	0.9	1.2	4.2	29.6	22.1	29.5	12.3	2.3
FATA	0.7	8.3	23.9	32.4	32.2	0.4	2.1	5.0	28.7	18.3	24.3	12.1	11.6
Gilgit-Baltistan	0.6	4.5	20.7	45.0	28.2	0.9	0.1	14.9	4.6	17.2	50.9	11.0	1.4
Islamabad - ICT	0.0	2.9	6.1	40.1	44.8	6.1	0.0	0.0	8.5	6.6	52.9	32.0	0.0
KPK	0.1	4.7	15.5	35.8	41.8	1.3	0.7	7.2	23.1	16.8	32.8	17.5	2.6
Punjab	0.3	10.4	16.1	31.9	37.7	2.5	1.1	18.7	11.5	7.8	39.6	19.2	3.2
Sindh	0.1	5.8	19.9	43.2	28.5	1.6	0.9	9.8	21.1	12.0	37.1	17.7	2.3
Total	0.2	8.0	18.9	36.6	33.5	1.7	1.0	12.0	17.0	13.5	37.6	16.8	3.1

Annex Table 187 ASER: Qualified teaching staff (% distribution), 2016

	Educational Qualification							Professional Qualification					
	Below matric	Matric	Inter	Graduate	Master	Post-graduate	Other	None	CT	PTC	B.Ed	M.Ed	Other
Overall	0.3	9.7	15.0	29.8	41.2	2.8	1.1	20.5	6.6	10.2	40.5	20.4	1.7
School type													
Government	0.2	8.5	8.6	24.9	52.4	4.2	1.2	5.3	8.0	13.3	44.6	26.7	2.1
Private	0.5	11.6	25.0	37.3	24.0	0.8	0.9	48.8	4.0	4.3	33.0	8.9	1.0
School level													
Primary	0.7	14.3	17.8	32.3	31.8	1.7	1.5	19.2	7.4	18.3	38.5	15.6	1.1
Secondary	0.2	11.7	19.1	33.0	32.6	2.4	1.0	29.5	6.1	8.9	38.2	15.8	1.6
High	0.3	7.2	11.9	27.7	48.2	3.6	1.0	16.0	6.9	8.6	42.6	24.0	1.9
School gender													
Mixed	0.4	11.8	21.3	34.6	29.3	1.4	1.1	35.5	5.2	9.2	36.1	12.8	1.3
Boys	0.1	6.8	8.6	25.7	53.4	4.2	1.3	8.2	7.1	10.5	45.7	26.2	2.2
Girls	0.5	9.6	10.3	24.0	50.6	4.2	0.7	6.7	9.5	12.1	41.3	28.7	1.7
Province/region													
AJK	0.1	5.9	27.2	43.5	20.7	1.1	1.5	12.1	19.4	9.1	42.9	14.6	2.0
Balochistan	0.5	11.4	36.2	33.8	15.2	0.8	2.0	9.3	19.0	31.2	27.3	10.6	2.5
FATA	0.6	6.0	19.1	35.1	36.5	0.6	2.1	10.4	15.5	30.7	26.5	12.8	4.0
Gilgit-Baltistan	0.3	4.1	18.0	42.7	33.2	0.8	0.9	10.8	15.0	4.6	55.7	12.2	1.8
Islamabad - ICT	0.0	4.1	13.5	42.6	33.8	4.1	2.0	43.2	2.3	0.0	37.1	17.4	0.0
KPK	0.2	4.4	16.2	32.3	43.8	1.9	1.3	4.6	16.9	22.1	34.5	19.9	2.0
Punjab	0.3	9.7	15.0	29.8	41.2	2.8	1.1	20.5	6.6	10.2	40.5	20.4	1.7
Sindh	0.1	4.1	18.3	45.4	30.7	0.8	0.6	14.9	8.0	19.8	34.2	21.7	1.4
Total	0.3	7.6	19.7	34.5	34.7	1.9	1.3	14.0	12.4	16.1	37.9	17.6	2.0

Annex Table 188 ASER: Qualified teaching staff (% distribution), 2018

	Education qualification							Professional Qualification					
	Below matric	Matric	Inter	Graduate	Master	Postgraduate	Other	None	CT	PTC	B.Ed	M.Ed	Other
Overall	0.3	5.4	7.9	31.4	50.9	4.1	0.2	19.8	5.9	6.7	47.9	18.6	1.1
School type													
Government	0.1	4.9	6.1	30.6	54.0	4.2	0.2	7.8	5.8	7.9	54.3	22.6	1.6
Private	1.9	9.8	24.4	38.7	22.0	3.2	0.0	42.0	6.1	4.5	36.0	11.4	0.1
School level													
Primary	0.3	6.2	8.5	35.6	46.8	2.7	0.0	19.2	4.8	10.2	49.8	15.1	1.0
Secondary	0.3	6.6	11.8	29.4	46.2	5.7	0.0	30.1	4.8	5.2	42.0	17.6	0.3
High	0.4	5.1	6.4	30.8	52.6	4.3	0.4	16.5	8.9	5.7	48.5	19.3	1.2
Other	0.0	0.8	3.4	22.2	68.7	4.9	0.0	0.9	1.9	0.0	57.9	35.2	4.2
School gender													
Boys	0.3	8.2	12.1	29.8	46.6	2.8	0.1	30.3	5.2	7.3	41.7	15.1	0.4
Girls	0.1	3.0	5.2	31.9	55.6	4.2	0.1	8.0	8.4	5.7	52.8	23.2	1.9
Mixed	0.6	5.3	6.6	32.5	49.1	5.5	0.4	14.3	3.9	6.8	54.1	19.7	1.2
Province/region													
AJK	0.5	3.2	13.5	47.1	33.6	1.7	0.4	2.7	11.5	5.1	54.0	25.1	1.5
Balochistan	0.5	9.3	41.4	31.6	15.9	0.6	0.6	4.9	7.1	46.6	28.2	11.2	2.0
FATA	0.7	7.8	22.8	30.7	35.7	0.9	1.4	5.5	20.8	35.9	22.5	9.7	5.5
Gilgit-Baltistan	1.3	4.1	14.8	44.1	34.8	0.9	0.0	16.9	13.3	3.3	51.3	14.3	0.8
Islamabad - ICT	0.0	1.4	5.8	33.3	57.2	0.7	1.4	23.1	4.1	2.0	59.9	10.9	0.0
KPK	0.1	3.7	12.9	26.3	53.4	1.7	1.9	3.0	18.1	20.1	29.7	20.6	8.5
Punjab	0.3	5.4	7.9	31.4	50.9	4.1	0.2	19.8	5.9	6.7	47.9	18.6	1.1
Sindh	0.0	2.0	11.5	56.7	29.1	0.4	0.3	2.2	18.9	8.0	55.9	14.6	0.5
Total	0.4	5.2	17.0	36.1	38.8	1.9	0.6	9.6	11.6	16.4	42.3	17.4	2.7

Annex Table 189 ASER: Qualified teaching staff (% distribution), 2019

	Education Qualification							Professional Qualification					
	Below matric	Matric	Inter	Graduate	Master	Postgraduate	Other	None	CT	PTC	B.Ed	M.Ed	Other
Overall	0.2	4.2	9.9	25.2	42.9	15.8	1.8	5.8	37.0	6.4	34.7	6.3	9.7
School type													
Government	0.3	3.7	5.8	20.8	48.3	18.7	2.3	6.5	38.0	7.1	37.5	6.9	4.0
Private	0.0	5.2	19.2	34.9	30.9	9.4	0.4	3.3	33.3	3.5	24.1	4.2	31.6
School level													
Other	0.0	2.5	6.3	27.3	56.7	6.9	0.3	5.3	54.1	3.7	33.9	0.4	2.6
Primary	0.2	5.5	12.0	29.7	41.2	10.8	0.6	5.8	38.9	8.9	26.5	5.1	14.7
Secondary	0.4	5.5	13.1	28.2	43.4	8.6	0.9	5.3	40.1	7.8	28.9	1.8	16.0
High	0.2	3.1	7.8	21.2	41.7	22.9	2.9	6.1	32.6	4.7	41.7	9.7	5.2
School gender													
Boys	0.3	5.1	14.7	29.9	38.3	10.7	0.9	5.0	38.0	5.9	29.0	4.5	17.5
Girls	0.2	3.4	6.1	22.1	47.0	18.4	2.8	6.2	38.5	6.0	35.8	7.3	6.1
Mixed	0.1	3.5	6.1	20.8	46.3	21.1	2.1	6.5	34.3	7.3	40.8	7.6	3.6
School location													
Rural	0.3	5.6	12.3	30.3	46.3	5.0	0.2	5.6	47.0	8.2	26.5	0.4	12.3
Urban	0.0	0.1	3.0	10.1	32.6	47.9	6.3	6.7	3.7	0.4	61.9	25.9	1.3
Province/region													
AJK	0.0	3.1	14.2	42.6	36.0	4.2	0.0	13.0	43.8	4.6	32.7	0.9	4.9
Balochistan	0.8	10.3	35.0	33.7	15.9	3.7	0.5	19.7	30.3	31.3	12.4	1.8	4.6
FATA	0.3	4.2	23.4	34.5	36.2	1.5	0.0	20.0	28.8	32.0	16.2	2.1	0.9
Gilgit-Baltistan	0.2	2.3	13.9	43.2	39.0	1.4	0.0	15.4	54.9	1.7	18.8	0.2	8.9
Islamabad - ICT	0.0	0.0	13.8	24.9	43.4	15.9	2.1	2.5	25.2	0.0	49.6	21.8	0.8
KPK	0.1	2.5	12.1	24.3	44.9	15.4	0.8	17.6	29.2	16.9	24.4	6.9	5.0
Punjab	0.2	4.2	9.9	25.2	42.9	15.8	1.8	5.8	37.0	6.4	34.7	6.3	9.7
Sindh	0.0	0.9	13.5	35.0	34.1	16.3	0.2	12.6	28.9	5.8	34.1	11.7	7.0
Total	0.2	3.8	14.5	31.0	38.3	11.4	0.9	12.5	36.9	10.8	27.8	5.0	7.1

E.10.2 Group-wise significance

The tables below present results of group-wise significance tests for teacher qualification. The numerical value is the difference in means of number of teachers under each category (i.e. average number of matric teachers in government school versus average number of matric teachers in private school). Stars are used to denote statistical significance.

Annex Table 190 ASER: Teacher education qualification, group-wise significance

		2012	2013	2014	2015	2016	2018	2019
School type								
diff. (Government)-(Private)	Below Matric			-0.515*	-0.231*	-0.226	-0.091	0.449
	Matric	-0.053	-0.192	-0.03	-0.302**	-0.529***	-0.988*	-0.228*
	Inter	-1.151***	-1.165***	-1.248***	-1.546***	-1.368***	-1.736***	-0.952***
	Graduate	-0.498*	-0.076	-0.454*	-0.584***	-1.070***	-1.134	-0.515**
	Master	2.756***	2.993***	2.626***	2.852***	2.649***	2.21	1.826***
	Postgraduate	-0.053	0.501	0.493	0.291	0.714***	-0.173	1.451***
	Other	-0.142	-0.324	0.233	0.25	0.322		1.272***
School level								
diff. (Primary)-(Secondary)	Below Matric			-0.194	-0.094	0.031	0.102	0.052
	Matric	-0.463***	-0.483***	-0.367***	-0.282**	-0.845***	-0.891***	-0.225*
	Inter	-1.133***	-1.160***	-0.946***	-1.082***	-1.128***	-1.228***	-0.565***
	Graduate	-2.014***	-2.009***	-1.767***	-1.734***	-1.673***	-1.602***	-1.032***
	Master	-1.679***	-1.572***	-1.951***	-1.978***	-2.015***	-2.599***	-2.054***
	Postgraduate	-0.589	0.007	-0.08	-0.174	-0.686***	-0.635*	-0.311
	Other	-0.989	0.367	-0.157	-0.491**	-0.301	0	-0.035
diff. (Primary)-(High)	Below Matric			-0.502	-0.235	-0.141	-0.096	-0.048
	Matric	-1.184***	-1.151***	-1.125***	-0.834***	-0.749***	-1.218***	-0.499***
	Inter	-1.816***	-1.687***	-1.881***	-1.535***	-1.309***	-1.702***	-0.791***
	Graduate	-4.475***	-4.611***	-3.828***	-4.227***	-3.043***	-4.719***	-2.112***
	Master	-5.240***	-5.651***	-5.235***	-6.608***	-6.753***	-8.671***	-4.234***
	Postgraduate	-0.900**	-0.571	-0.858***	-1.031***	-0.944***	-0.878**	-3.064***
	Other	-2.087	-0.2	-0.605	-1.583***	-0.472	-1.2	-1.308**
diff. (Secondary)-(High)	Below Matric			-0.307	-0.141	-0.172	-0.198	-0.1
	Matric	-0.721***	-0.668***	-0.758***	-0.551***	0.097	-0.327	-0.274
	Inter	-0.683**	-0.527**	-0.935***	-0.453**	-0.181	-0.474	-0.226
	Graduate	-2.461***	-2.602***	-2.061***	-2.493***	-1.370***	-3.116***	-1.080***
	Master	-3.561***	-4.079***	-3.284***	-4.629***	-4.738***	-6.072***	-2.180***

	Postgraduate	-0.311	-0.577*	-0.779***	-0.857***	-0.259	-0.243	-2.753***
	Other	-1.098	-0.567	-0.448	-1.092*	-0.171	-1.2	-1.273**
School gender								
diff. (Boys)-(Girls)	Below Matric			0.744*	0.062	-0.571*	-0.058	0.131
	Matric	0.002	-0.354*	-0.352*	0.212	-0.394*	0.201	0.089
	Inter	0.958***	-0.464*	0.022	0.870***	-0.189	0.013	0.820***
	Graduate	-0.077	-0.073	0.3	-0.755***	0.33	-0.839*	-0.227
	Master	-2.731***	0.973*	0.46	-3.488***	0.34	-1.741**	-1.557***
	Postgraduate	-0.048	0.524	-0.077	-0.764***	-0.341	-0.891***	-1.257**
	Other	-0.135	-0.3	-0.813	-1.201**	0.295	-0.8	-1.068**
diff. (Boys)-(Mixed)	Below Matric			0.338	-0.024	-0.280*	-0.460**	0.232
	Matric	-0.357**	0.053	-0.113	-0.165	-0.293*	-0.571	0.152
	Inter	0.118	0.924***	-0.805***	0.580**	-0.723***	-0.214	0.475*
	Graduate	-0.347	-0.772***	0.462*	-0.744**	0.119	-0.837*	-0.185
	Master	-2.443***	-3.456***	2.856***	-3.411***	3.218***	-0.947	-1.558***
	Postgraduate	-0.336	-0.670*	0.274	-0.717***	0.504***	-0.891*	-2.207***
	Other	-0.351	0.265	-0.456	-0.558*	0.337	-1.800**	-0.857*
diff. (Girls)-(Mixed)	Below Matric			-0.405	-0.086	0.291	-0.403	0.102
	Matric	-0.359*	-0.301	0.239	-0.377**	0.1	-0.773	0.063
	Inter	-0.840**	0.460*	-0.827***	-0.29	-0.534*	-0.227	-0.345*
	Graduate	-0.27	-0.844	0.162	0.01	-0.211	0.001	0.042
	Master	0.287	-2.484***	2.396***	0.077	2.878***	0.794	-0.001
	Postgraduate	-0.288	-0.146	0.35	0.047	0.845***	0	-0.95
	Other	-0.216	-0.035	0.357	0.643	0.042	-1	0.211
School location								
diff. (Rural)-(Urban)	Below Matric			0.013	-0.264			0.034
	Matric	-1.076***	-1.099***	-0.714***	-0.510**			0.34
	Inter	-0.984**	-0.736**	-0.972***	-0.683***			0.576*
	Graduate	-3.040***	-4.696***	-1.823***	-1.552***			-0.15
	Master	-3.387***	-3.046***	-1.635***	-2.235***			-4.856***
	Postgraduate	-1.144***	-0.233	-0.699**	-1.540***			-1.931***
	Other	-1.56	-0.61	0.918	-3.219***			
Province/region								
diff. (PJ)-(SN)	Below Matric			0.067	0.132	0.239	0.167	0.314
	Matric	0.679***	-0.063	0.122	0.131	0.755***	0.028	0.559**
	Inter	0.442*	-0.194	-0.286*	-0.096	0.677***	0.334*	0.05

	Graduate	0.986***	0.672*	-0.118	0.434**	1.061***	1.430***	0.560***
	Master	0.299	0.691*	0.428	1.519***	2.208***	2.756***	1.878***
	Postgraduate	-0.403	0.342	-0.215	-0.043	0.581*	-0.947	-0.501
	Other	-0.5	-0.466	-1.561**	-0.122	0.35	-0.25	1.142**
diff. (PJ)-(BL)	Below Matric			0.037	0.233	0.574***	-0.480***	0.339
	Matric	0.188	-0.018	-0.155	-0.02	-0.119	0.07	0.456***
	Inter	0.161	-0.138	-0.288*	-0.254*	-0.103	0.033	0.312**
	Graduate	0.664***	-0.837**	0.087	-0.506**	-0.510**	1.061***	-0.728***
	Master	0.779*	-1.205***	-0.037	-1.775***	-1.818***	1.415*	-2.139***
	Postgraduate	-0.492	-0.342	-0.569	0.391	0.222	-0.78	-1.782**
	Other	-0.5	0.614	0.616*	0.468	0.754***	-0.327	-1.071***
diff. (PJ)-(KP)	Below Matric			0.152	-0.107	0.074	-0.119	-0.131
	Matric	0.636***	-0.914***	-0.667***	-0.662***	-0.551***	0.397*	-0.211*
	Inter	0.381**	-0.456***	-0.339**	-0.431***	-0.339**	0.136	-0.048
	Graduate	0.614***	-0.956***	-0.527***	-0.558***	-0.397**	0.838**	-0.665***
	Master	0.342	-0.031	0.1	-0.741***	-0.335	-0.574	0.018
	Postgraduate	0.033	-0.380*	0.161	-0.295	-0.001	-0.055	1.377**
	Other	-0.32	0.427	0.459	-0.36	0.675**	-4.25	-0.103
diff. (PJ)-(GB)	Below Matric			1.583*	2.949***	0.445	-0.405**	1.419*
	Matric	0.411**	-0.728***	-0.545**	-0.539**	-0.459*	0.468*	-0.064
	Inter	0.281	-0.336*	-0.257	-0.109	-0.073	-0.118	-0.052
	Graduate	-0.184	0.542	0.759***	0.427	0.415	-0.353	0.626***
	Master	1.163***	-1.147***	-0.895**	-1.061**	-1.185**	1.288*	-0.579**
	Postgraduate	0.458	-0.509	-0.419	1.348*	-0.042	0.945***	-2.356**
	Other	-0.417	0.187	0.889	0.028	1.010*	0.75	
diff. (PJ)-(AJK)	Below Matric			-0.369*	-0.251**	-0.328***	0.061	-0.358
	Matric	0.532***	-0.765***	-0.465***	-0.806***	-1.071***	0.726***	-0.539***
	Inter	0.398**	-0.248	-0.117	-0.418***	-0.269*	0.199	0.012
	Graduate	0.432*	-0.112	-0.081	-0.457**	-0.367*	-0.192	0.776***
	Master	1.671***	-1.852***	-1.710***	-2.198***	-3.155***	1.815***	-1.000***
	Postgraduate	0.208	-1.125***	-0.660*	-0.810***	-1.051***	1.031***	-2.693***
	Other	0.352	-0.675***	0.36	-0.35	-0.623***	0.542*	
diff. (PJ)-(ICT)	Below Matric			0.083		-0.355	0.167	
	Matric	0.763	-0.009	0.154	-0.149	-0.745	-0.409	
	Inter	1.093	0.034	-0.239	-0.136	-0.4	-2.161*	0.588
	Graduate	-5.493***	1.049	2.361***	4.261***	0.969	-4.404**	-1.245

	Master	-1.648*	1.26	1.909**	4.800***	0.04	-8.527**	-2.115**
	Postgraduate	-2.192***	0.021	0.715	2.302***	0.222	0.553	-1.502
	Other	-0.5		2.5		2.087	-1.25	0.458
diff. (PJ)-(FATA)	Below Matric			0.123	0.471**	0.312	-0.548**	0.619
	Matric	0.529***	-0.915***	-0.836***	-0.497**	-0.515**	0.287	-0.159
	Inter	0.709***	-0.763***	-0.758***	-0.653***	-0.586***	0.016	-0.403**
	Graduate	1.340***	-1.883***	-1.068***	-1.372***	-0.757***	1.577***	-1.167***
	Master	1.210**	-1.433**	-1.109**	-1.858***	-1.439***	2.277***	-1.790***
	Postgraduate	0.958	-0.009	-0.156	-0.537	-0.572	0.387	-2.367
	Other	0.583	0.074	1	0.263	0.306	-0.35	

*p<0.05, **p<0.01, ***p<0.001

Annex Table 191 ASER: Teacher education qualification, significance over time

	Matric	Inter	Graduate	Master	Postgraduate	Other
	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)
Overall	0.870***	0.881***	0.796***	-0.159	-2.436***	-0.042
School type						
Government	0.932***	0.772***	0.785***	0.259	-2.827***	-0.369
Private	0.756***	0.972***	0.768***	-0.671***	-1.323	1.045**
School level						
Primary	0.530***	0.166	-0.498***	-0.880***	-1.720**	-0.732*
Secondary	0.767***	0.734***	0.483*	-1.256***	-1.442*	0.222
High	1.215***	1.191***	1.864***	0.125	-3.884***	0.047
School gender						
Boys	0.700***	0.880***	0.870***	-0.702***	-1.664**	0.319
Girls	0.787***	0.742***	0.720**	0.471	-2.874***	-0.614
Mixed	1.209***	1.237**	1.032**	0.183	-3.535**	-0.187
Location						
Rural	0.769***	0.755***	0.613***	-0.183	-0.516***	1.043**
Urban	1.879	2.079***	4.230***	3.054***	-4.229**	0.672

*p<0.05, **p<0.01, ***p<0.001

Annex Table 192 ASER: Teacher professional qualification, group-wise significance

		2012	2013	2014	2015	2016	2018	2019
School type								
diff. (Government)-(Private)	None			-3.319***	-4.452***	-4.578***	-1.643**	0.749***
	PTC	1.281***	1.285***	1.135***	0.424**	0.592**	0.403	0.803***
	CT	0.792***	1.106***	1.079***	1.115***	0.096	0.706	1.668***
	B.Ed.	1.440***	1.685***	1.158***	1.724***	1.250***	2.264***	2.076***
	M.Ed.	1.345***	1.668***	1.654***	1.831***	1.711***	1.561**	2.031***
	Other	-0.394	-1.674***	-0.704*	0.024	0.408*	1.425**	-2.471***
School level								
diff. (Primary)-(Secondary)	None			-2.260***	-2.683***	-3.063***	-1.905***	-0.131
	PTC	-0.624***	-0.398**	-0.424***	-0.387***	-0.524***	-0.474*	-0.255
	CT	-0.521***	-0.400**	-0.131	0.099	-0.515***	-0.462	-1.434***
	B.Ed.	-1.920***	-1.879***	-1.963***	-1.911***	-1.835***	-1.248***	-1.516***
	M.Ed.	-0.733***	-0.706***	-0.916***	-0.941***	-1.011***	-0.632*	0.775
	Other	-1.017*	-0.506	-0.662*	-0.948***	-0.558**	0.5	-1.324***
diff. (Primary)-(High)	None			-4.279***	-4.407***	-3.387***	-1.231*	-0.715***
	PTC	-1.830***	-1.573***	-1.688***	-1.367***	-1.021***	-1.039**	-0.569***
	CT	-1.582***	-1.586***	-1.174***	-1.121***	-1.270***	-2.810***	-3.637***
	B.Ed.	-4.530***	-4.868***	-4.476***	-5.836***	-5.080***	-5.544***	-3.883***
	M.Ed.	-2.464***	-2.860***	-2.673***	-3.416***	-3.492***	-2.272***	-1.731***
	Other	-2.183**	-1.353	-2.149***	-1.922***	-0.815***	-0.738	-0.731*
diff. (Secondary)-(High)	None			-2.019**	-1.724***	-0.325	0.673	-0.583**
	PTC	-1.206***	-1.174***	-1.264***	-0.980***	-0.497*	-0.565	-0.314
	CT	-1.061***	-1.187***	-1.043***	-1.220***	-0.755***	-2.348*	-2.202***
	B.Ed.	-2.609***	-2.989***	-2.513***	-3.925***	-3.245***	-4.297***	-2.367***
	M.Ed.	-1.731***	-2.155***	-1.757***	-2.475***	-2.481***	-1.639*	-2.506***
	Other	-1.166**	-0.847	-1.487***	-0.974**	-0.257	-1.238*	0.593
School gender								
diff. (Boys)-(Girls)	None			-0.396	2.844***	0.37	1.013	-0.261
	PTC	-0.561***	-0.681**	0.121	-0.619***	-0.089	-0.186	-0.266
	CT	-0.661**	-0.125	-0.396*	-0.564***	-0.285	-1.569*	-1.618***
	B.Ed.	-1.686***	0.883*	0.472	-2.852***	0.685	-2.116***	-1.505***
	M.Ed.	-1.152***	0.099	-0.096	-1.921***	-0.074	-1.608**	-1.842***
	Other	-0.122	1.307***	-0.178	-0.665*	0.083	-1.125**	1.069*
	None			-1.975**	2.368***	-2.475***	-2.037*	-0.529**

		2012	2013	2014	2015	2016	2018	2019
diff. (Boys)-(Mixed)	PTC	-1.400***	-0.679***	0.955***	-0.715***	0.341*	-0.462	-0.688***
	CT	-0.954***	-0.611**	0.397**	-1.150***	0.337*	-0.841	-1.438***
	B.Ed.	-1.513***	-2.527***	1.638***	-2.434***	2.179***	-1.890***	-2.361***
	M.Ed.	-1.318***	-1.588***	1.430***	-2.218***	1.802***	-0.599	-1.654***
	Other	0.061	0.473	-0.413	-0.194	0.467*	-2.292***	1.615***
diff. (Girls)-(Mixed)	None			-1.579*	-0.476	-2.845***	-3.050**	-0.268
	PTC	-0.840***	-1.360***	0.834***	-0.096	0.429*	-0.277	-0.422
	CT	-0.293	-0.736**	0.792***	-0.586**	0.622**	0.727	0.18
	B.Ed.	0.173	-1.644***	1.166***	0.418	1.494***	0.226	-0.856*
	M.Ed.	-0.166	-1.489***	1.527***	-0.297	1.876***	1.009	0.188
	Other	0.183	1.781*	-0.235	0.471	0.384	-1.167*	0.545
School location								
diff. (Rural)-(Urban)	None			-1.241	-1.840**			-0.604***
	PTC	-2.410***	-2.395***	-1.088***	-0.517*			0.183
	CT	-1.302***	-1.218***	-1.155***	-1.503***			1.992***
	B.Ed.	-1.511***	-3.220***	-1.255***	-2.069***			-2.686***
	M.Ed.	-3.768***	-1.703***	-1.213***	-1.314***			-2.934***
	Other	-0.529	0.061	-0.801	-1.601**			1.683*
Province/region								
diff. (PJ)-(SN)	None			1.248**	1.924***	1.898***	2.979***	-0.151
	PTC	0.214	0.24	-0.069	-0.008	0.581***	0.115	0.438***
	CT	0.156	0.271	0.004	-0.105	0.363*	0.685**	1.771***
	B.Ed.	1.428***	1.084***	0.916***	1.419***	2.257***	1.947***	1.078***
	M.Ed.	-1.663***	-0.069	-0.865**	0.175	0.754**	1.132**	-1.381**
	Other	0.212	0.866*	-1.264**	0.226	0.191	0.143	0.182
diff. (PJ)-(BL)	None			-0.629	-2.485***	-1.947***	2.074***	0.417***
	PTC	0.08	-0.182	0.737***	0.215*	0.215	-0.268	0.937***
	CT	0.118	-0.064	0.331**	0.301**	0.274*	0.422	-1.361***
	B.Ed.	1.044***	-1.451***	-0.459*	-1.524***	-1.202***	1.241***	-1.688***
	M.Ed.	0.147	-0.630*	-0.439	-0.261	-0.710**	-0.121	-1.439**
	Other	-0.920*	0.479	0.527*	0.011	0.805***	-0.466	-1.169***
diff. (PJ)-(KP)	None			-0.623	-1.384***	-1.385*	1.369*	0.786***
	PTC	-0.901***	0.309*	0.752***	0.554***	0.367***	-0.628***	0.489***
	CT	-0.527***	0.247*	0.359**	0.445***	0.422**	-0.601	-0.997***
	B.Ed.	0.898***	-0.853***	-0.697***	-1.399***	-1.121***	0.551	-0.480*

		2012	2013	2014	2015	2016	2018	2019
	M.Ed.	0.436*	-0.697***	-0.669***	-0.602***	-0.524**	-1.056*	1.794***
	Other	-0.511*	0.256	0.908***	-0.215	1.256***	-1.912***	1.526***
diff. (PJ)-(GB)	None			-0.786	-1.367**	-1.875***	1.291**	0.325**
	PTC	1.119***	-0.962***	-0.062	0.205	-0.563*	0.608*	-0.327
	CT	-0.037	-0.075	-0.493**	-0.722***	0.071	0.35	0.684***
	B.Ed.	-0.247	0.374	0.730**	0.14	0.604*	-0.656	-1.512***
	M.Ed.	1.277***	-1.133***	-0.953**	-0.605	-1.076***	0.602	-1.229
	Other	0.837	0.186	-0.461	0.001	1.088***	0.451	0.368
diff. (PJ)-(AJK)	None			-2.100***	-2.500***	-3.393***	3.425***	0.233*
	PTC	0.431**	-0.705***	0.125	0.174	-1.030***	0.751***	-0.516***
	CT	0.126	0.081	-0.262*	-0.586***	-0.279**	0.777***	0.069
	B.Ed.	0.588**	-0.42	-0.497*	-1.161***	-1.407***	0.651*	-0.578**
	M.Ed.	0.829**	-1.749***	-0.953***	-1.206***	-1.864***	0.688**	-1.978***
	Other	-0.206	-1.229***	-0.255	-0.365	-0.798***	0.740***	-1.324***
diff. (PJ)-(ICT)	None			2.556	-4.494	6.502**	-2.703	-0.621
	PTC	1.28	-0.506	0.082	0.794	-2.07	0.583	
	CT	-0.399	-0.154	0.317	0.405	-1.071	-0.011	-1.433
	B.Ed.	-1.568**	1.294	0.864	5.425***	-0.145	-6.154***	-1.305
	M.Ed.	-2.862***	0.093	1.338**	2.975***	-0.657	-0.513	0.26
	Other		0.519	0.389		-1.112		-1.874
diff. (PJ)-(FATA)	None			-1.234	-1.321	-1.684*	2.570***	0.067
	PTC	0.511**	-0.815***	0.002	0.186	-0.011	-0.208	0.057
	CT	-0.42	-0.358	-0.572***	-0.239	0.115	0.109	-1.967***
	B.Ed.	1.226**	-1.873***	-1.810***	-2.156***	-1.670***	1.914**	-1.579***
	M.Ed.	0.801	-0.931*	-0.877	-0.675	-0.851*	0.647	0.496
	Other	1.122***	-0.777*	-0.083	0.534	0.261	-0.79	-1.041

*p<0.05, **p<0.01, ***p<0.001

Annex Table 193 ASER: Teacher professional qualification, significance over time

	PTC	CT	B.Ed.	M.Ed.	Other
	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)
Overall	1.006***	-1.618***	0.228	0.241	-0.537*
School type					
Government	1.073***	-1.918***	0.246	-0.07	0.515*
Private	0.595**	-1.042***	0.882***	0.616*	-1.562*
School level					
Primary	0.425***	-0.934***	-0.264*	-0.564*	-1.681**
Secondary	0.794***	-1.847***	0.14	0.944**	-1.989***
High	1.687***	-2.989***	0.382	0.17	-0.229
School gender					
Boys	0.606***	-1.264***	0.409*	0.227	-1.265*
Girls	0.901***	-2.221***	0.59	-0.463	-0.074
Mixed	1.319***	-1.748***	-0.44	-0.108	0.289
Location					
Rural	0.817***	-1.666***	0.945***	2.072***	-0.840**
Urban	3.410*	1.628***	-0.23	2.906***	1.372*

*p<0.05, **p<0.01, ***p<0.001

E.11 School environment

The ASER school observation sheet also records presence of facilities in the school. The following list of facilities have been selected for this analysis.

Annex Table 194 ASER: Questions on facilities in school

Facility	Question in the ASER survey
Drinking water	Is there a useable drinking water facility for the children in the school?
Boundary wall	Is there a complete boundary wall/fence?
Toilet	Is there a useable toilet/latrine for the children?
Playground	Is there a playground in the school?
Laboratory[59]	Is there a science laboratory?[60]
Computer lab	Is there a computer lab?

E.11.1 Overall school facilities

The tables below provide the percentages of schools that have the above facilities over school level variables, and by provinces/regions. In 2012, 94.4% of schools have a drinking water facility for children.

[59] Data on this facility was not gathered in the ASER 2019 survey.
[60] Data was not collected on this facility in 2019.

Annex Table 195 ASER: Availability of drinking water in school

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	1752	94.4	1860	97.4	1783	94.3	1836	95.3	1632	97.4	1413	96.3	1839	96.4
School type														
Government	1037	93	1094	97.5	1023	92.6	1121	94.0	971	96.5	930	96.1	1196	96.5
Private	715	96.6	766	97.3	760	96.8	715	97.5	661	98.8	483	96.6	643	96.4
School level														
Primary	586	93	575	96.3	623	91.9	657	92.8	611	96.5	679	95	824	95.8
Secondary	632	95.8	674	98.1	615	96.1	626	97.4	559	98.4	347	96.4	392	96.6
High	472	94.6	540	97.8	501	95.4	508	95.8	433	97.5	342	98.6	554	97.5
Other					44	93.6	44	100	29	96.7	40	97.6	69	94.5
School gender														
Boys	854	95.3	612	97.9	453	93.8	978	95.6	474	96.7	720	96.8	964	96.5
Girls	554	92.2	316	97.5	374	94.2	547	95.6	224	97.4	412	95.8	450	96.8
Mixed	344	96.1	932	97.1	956	94.7	310	93.9	933	97.8	281	95.6	424	95.9
Location														
Rural	1643	94.2	1730	97.3	1533	93.9	1634	95.8					1463	95.7
Urban	109	99.1	130	99.2	250	97.3	202	91.8					376	99.2

Annex Table 196 ASER: Availability of drinking water in school by province

Drinking water	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	398	73.7	368	69	305	59.6	439	76.6	473	81.6	401	74.5	430	78.3
Balochistan	464	53.3	353	44.9	379	40	333	33.2	274	27.9	418	40.4	405	38.9
FATA	165	54.5	207	66.6	215	69.1	257	70.6	241	75.8	273	67.9	245	66.9
Gilgit-Baltistan	194	58.4	260	72.8	183	52.6	206	63.6	220	66.7	319	70.9	445	72.6
Islamabad-ICT	42	93.3	52	100	77	97.5	29	90.6	16	80.0	32	88.9	39	95.1
KPK	813	76.6	978	86.5	896	82.0	905	83.3	737	87.6	722	87.6	1029	89.0
Punjab	1752	94.4	1860	97.4	1783	94.3	1836	95.3	1632	97.4	1413	96.3	1839	96.4
Sindh	517	65.5	734	76.7	704	70.8	719	70.7	482	65.9	550	79.4	668	71.8
Total	4345	75.0	4812	79.7	4542	73.6	4724	74.7	4075	74.4	4128	75.8	5100	77.2

Annex Table 197 ASER: Availability of boundary wall in school

	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	1639	88.4	1711	89.6	1753	92.5	1796	93.4	1620	95.9	1403	95.6	1827	96.7
School type														
Government	929	83.5	942	84.2	1002	90.4	1095	91.9	967	95.6	925	95.6	1191	97.1
Private	710	95.8	769	97.3	751	95.4	701	95.9	653	96.5	478	95.6	636	95.9
School level														
Primary	526	83.9	511	85.7	605	88.5	636	90.1	603	94.2	672	94.0	821	96.2
Secondary	601	91.1	635	92.3	610	95.2	611	95.0	552	96.7	346	96.1	391	96.5
High	453	90.4	502	90.9	499	95.2	508	96.0	434	97.1	339	97.7	548	97.9
Other					39	83.0	40	93.0	31	100	41	100	67	93.1
School gender														
Boys	844	94.1	502	80.3	435	89.5	951	93.5	466	94.9	713	95.8	952	96.0
Girls	469	78.3	300	93.2	374	94.0	530	92.8	225	97.0	406	94.4	444	97.4
Mixed	326	91.1	909	94.5	944	93.3	314	94.3	928	96.2	284	96.6	430	97.5
Location														
Rural	1533	87.9	1582	89.0	1506	91.9	1593	93.6					1446	95.8
Urban	106	97.2	129	97.7	247	95.7	203	92.3					381	100

Annex Table 198 ASER: Availability of boundary wall in school by province

Boundary wall	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	209	39.6	202	38.0	202	39.4	238	41.6	403	69.4	268	49.8	307	56.3
Balochistan	490	56.0	333	42.3	476	50.1	560	55.6	442	45.1	539	52.1	697	67.2
FATA	208	68.4	213	68.5	242	77.6	288	79.3	268	83.2	316	78.6	321	87.7
Gilgit-Baltistan	203	60.4	232	64.8	215	61.6	215	66.0	230	69.9	329	73.1	471	77.2
Islamabad-ICT	46	100	48	92.3	76	96.2	24	75.0	18	90.0	31	86.1	37	90.2
KPK	863	81.2	914	80.7	881	80.5	864	81.5	753	89.1	755	91.6	1066	92.6
Punjab	1639	88.4	1711	89.6	1753	92.5	1796	93.4	1620	95.9	1403	95.6	1827	96.7
Sindh	558	70.5	690	72.3	743	74.9	729	71.5	495	67.5	526	75.9	686	73.6
Total	4216	72.7	4343	72.0	4588	74.2	4714	74.8	4229	76.9	4167	76.5	5412	82.3

Annex Table 199 ASER: Availability of toilets in school

Toilet	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	1724	92.7	1767	92.7	1792	94.6	1849	95.9	1643	97.4	1430	97.4	1808	95.1
School type														
Government	1018	90.9	1017	90.9	1044	94.1	1131	94.6	989	97.6	945	97.6	1179	95.4
Private	706	95.4	750	95.3	748	95.2	718	98.0	654	97.0	485	97.0	629	94.6
School level														
Primary	557	88.3	534	89.7	638	93.4	666	94.1	611	95.9	692	96.8	802	93.8
Secondary	626	94.4	647	94.3	609	95.2	624	96.9	559	98.1	350	97.2	392	96.1
High	479	95.8	518	93.8	503	95.8	514	96.8	443	98.7	343	98.8	548	97.0
Other					42	89.4	44	100	30	96.8	40	97.6	66	90.4
School gender														
Boys	842	94.0	557	89.3	454	93.6	986	96.4	478	97.2	726	97.6	950	95.5
Girls	547	90.4	304	94.1	382	96.0	543	95.1	228	98.7	418	97.2	440	95.0
Mixed	335	93.3	906	94.5	956	94.5	319	95.8	936	97.2	286	97.3	417	94.3
Location														
Rural	1616	92.3	1638	92.3	1547	94.4	1639	96.0					1430	93.9
Urban	108	98.2	129	98.5	245	95.3	210	95.5					378	100

Annex Table 200 ASER: Availability of toilets in school by province

Toilet	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	312	57.8	289	54.4	288	55.8	408	71.2	473	81.4	386	71.7	430	78.5
Balochistan	303	35.2	241	30.7	325	34.2	263	26.2	240	24.4	264	25.5	342	33.0
FATA	130	43.0	99	32.1	121	38.8	199	54.5	185	57.3	213	53.0	242	66.3
Gilgit-Baltistan	192	57.5	223	62.3	199	57.0	196	59.9	216	65.7	319	70.9	457	74.6
Islamabad-ICT	40	87.0	49	94.2	77	98.7	30	93.8	19	95.0	35	97.2	39	97.5
KPK	770	72.7	849	75.1	874	80.1	855	78.6	727	86.3	756	91.7	1049	90.8
Punjab	1724	92.7	1767	92.7	1792	94.6	1849	95.9	1643	97.4	1430	97.4	1808	95.1
Sindh	460	58.7	609	63.5	642	64.6	652	63.9	379	51.8	401	57.9	660	70.8
Total	3931	67.9	4126	68.4	4318	69.8	4452	70.2	3882	70.6	3804	69.9	5027	76.3

Annex Table 201 ASER: Availability of playground in school

Playground	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	1006	55.0	1047	55.0	1096	58.8	1186	62.2	1142	68.1	1018	69.3	1183	62.3
School type														
Government	683	61.9	692	62.0	734	67.3	809	68.4	780	77.3	711	73.5	860	69.5
Private	323	44.5	355	45.2	362	46.9	377	52.0	362	54.2	307	61.4	323	48.7
School level														
Primary	282	45.7	240	40.5	352	52.6	405	57.9	408	64.3	429	60.0	495	57.9
Secondary	349	53.4	379	55.3	376	59.9	385	60.2	371	65.4	270	75.0	273	67.2
High	329	66.7	374	67.9	338	65.0	366	69.6	338	76.1	284	81.8	359	63.4
Other					30	65.2	29	69	25	80.6	33	80.5	56	76.7
School gender														
Boys	402	45.5	410	65.6	315	65.5	570	56.4	391	80.1	469	63.0	566	56.9
Girls	387	65.3	208	65.0	271	69.1	391	69.0	172	74.1	340	79.1	322	69.4
Mixed	217	61.5	429	44.8	510	51.5	224	68.1	578	60.5	209	71.1	294	66.7
Location														
Rural	946	54.7	991	55.9	983	61.0	1082	64.1					997	65.4
Urban	60	60.0	56	43.1	113	45.0	104	47.1					186	49.5

Annex Table 202 ASER: Availability of playground in school by province

Playground	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	189	36.1	210	39.6	206	40.4	207	36.1	278	47.8	226	42.0	316	57.7
Balochistan	286	33.2	233	29.7	210	22.2	200	20.0	182	18.6	128	12.4	212	20.4
FATA	74	24.6	85	27.6	94	30.4	130	35.7	79	24.5	168	41.8	175	48.2
Gilgit-Baltistan	169	51.1	186	52.2	160	46.0	169	52.0	178	53.9	258	57.3	352	57.8
Islamabad-ICT	24	52.2	26	50.0	57	73.1	25	78.1	17	89.5	24	66.7	36	87.8
KPK	417	40.2	435	39.0	425	39.3	529	50.1	370	44.0	322	39.1	553	48.0
Punjab	1006	55.0	1047	55.0	1096	58.8	1186	62.2	1142	68.1	1018	69.3	1183	62.3
Sindh	351	45.5	406	42.7	512	51.9	545	53.6	341	46.8	386	55.7	438	47.0
Total	2516	44.1	2628	43.8	2760	45.1	2991	47.7	2587	47.2	2530	46.5	3265	49.6

Annex Table 203 ASER: Availability of laboratory in school

Laboratory	2012		2013		2014		2015		2016		2018	
	#	%	#	%	#	%	#	%	#	%	#	%
Overall	346	19.1	398	21.0	415	22.0	427	22.7	406	24.2	369	25.1
School type												
Government	240	21.9	281	25.2	291	26.4	284	24.4	287	28.4	248	25.6
Private	106	14.8	117	15	124	15.9	143	19.9	119	17.8	121	24.2
School level												
Primary	22	3.6	11	1.9	31	4.6	35	5.1	33	5.2	64	9.0
Secondary	31	4.8	38	5.6	51	8.0	64	10.2	63	11.1	51	14.2
High	252	51.1	306	55.5	296	56.3	299	57.5	287	64.6	224	64.6
Other					37	78.7	28	63.6	23	74.2	28	68.3
School gender												
Boys	109	12.5	211	33.8	169	35.1	138	13.9	201	41.2	144	19.4
Girls	159	26.8	77	24.1	110	27.6	208	36.9	72	30.9	140	32.6
Mixed	78	22.4	110	11.6	136	13.5	80	24.7	133	13.9	85	28.9
Location												
Rural	307	17.8	364	20.6	328	20.2	362	21.8				
Urban	39	42.4	34	26.4	87	33.9	65	29.5				

Annex Table 204 ASER: Availability of laboratory in school by province

Laboratory	2012		2013		2014		2015		2016		2018	
	#	%	#	%	#	%	#	%	#	%	#	%
AJK	87	16.6	111	20.9	105	20.3	106	18.5	112	19.3	121	22.5
Balochistan	103	12.1	99	12.6	87	9.2	75	7.5	55	5.6	51	4.9
FATA	42	14.0	35	11.4	39	12.5	46	12.6	40	12.4	63	15.7
Gilgit-Baltistan	88	27.1	93	26.1	92	26.4	69	21.1	70	21.3	108	24.0
Islamabad-ICT	24	52.2	21	42.0	28	36.4	22	68.8	7	35.0	10	27.8
KPK	286	27.8	327	29.6	318	29.3	325	31.5	190	22.7	184	22.3
Punjab	346	19.1	398	21.0	415	22.0	427	22.7	406	24.2	369	25.1
Sindh	81	11.0	134	14.1	157	15.9	175	17.2	78	10.6	50	7.2
Total	1057	18.8	1218	20.4	1241	20.1	1245	20.0	958	17.5	956	17.6

Annex Table 205 ASER: Availability of computer laboratory in school

Computer lab	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	471	26.0	523	27.7	486	25.8	539	28.6	449	44.1	385	26.2	548	29.8
School type														
Government	283	25.8	314	28.2	292	26.5	359	30.7	291	58.2	263	27.2	392	33.2
Private	188	26.3	209	26.9	194	24.8	180	25.2	158	30.6	122	24.4	156	23.6
School level														
Primary	37	6.1	28	4.7	19	2.8	33	4.8			42	5.9	101	12.2
Secondary	95	14.8	102	15.0	109	17.2	139	22.2	134	23.5	63	17.5	88	22.5
High	301	60.9	342	62.2	315	60.2	334	63.9	315	70.5	248	71.5	314	56.7
Other					43	91.5	32	74.4			30	73.2	45	63.4
School gender														
Boys	193	22.1	230	36.9	173	35.7	177	17.9	199	66.6	140	18.8	214	22.0
Girls	183	30.8	92	28.7	116	29.2	236	41.9	82	52.2	149	34.7	166	36.8
Mixed	95	27.4	201	21.2	197	19.6	125	38.2	168	30.0	96	32.7	167	40.0
Location														
Rural	421	24.5	470	26.7	378	23.2	448	26.9					387	26.5
Urban	50	52.6	53	40.8	108	41.9	91	41.6					161	42.6

Annex Table 206 ASER: Availability of computer laboratory in school by province

Computer lab	2012		2013		2014		2015		2016		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
AJK	88	17.0	88	16.6	75	14.6	59	10.4	39	19.2	107	19.9	109	24.4
Balochistan	49	5.8	47	6.0	41	4.3	15	1.5	25	8.7	21	2.0	31	6.5
FATA	19	6.4	14	4.6	12	3.9	18	4.9	8	12.9	36	9.0	12	5.5
Gilgit-Baltistan	60	18.4	68	19.1	59	17.0	50	15.4	50	29.1	103	22.9	86	17.5
Islamabad-ICT	30	65.2	24	46.2	40	51.3	22	71.0	8	66.7	17	47.2	22	53.7
KPK	124	12.2	156	14.2	141	13.0	219	22.1	46	38.3	122	14.8	178	17.5
Punjab	471	26.0	523	27.7	486	25.8	539	28.6	449	44.1	385	26.2	548	29.8
Sindh	82	11.1	147	15.6	135	13.7	141	13.9	29	28.4	23	3.3	132	18.3
Total	923	16.5	1067	17.9	989	16.1	1063	17.2	654	33.1	814	14.9	1118	21.3

E.11.2 Group-wise significance

Annex Table 207 ASER: Availability of drinking water, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	-0.036***	0.002	-0.042***	-0.036***	-0.023**	-0.005	0
School level							
diff. (Primary)-(Secondary)	-0.027*	-0.018*	-0.042**	-0.046***	-0.019*	-0.014	-0.007
diff. (Primary)-(High)	-0.016	-0.015	-0.035*	-0.031*	-0.01	-0.036**	-0.017
diff. (Secondary)-(High)	0.012	0.003	0.007	0.015	0.009	-0.022	-0.01
School gender							
diff. (Boys)-(Girls)	0.031*	0.004	0	0.002	-0.012	0.012	-0.005
diff. (Boys)-(Mixed)	-0.008	-0.008	-0.006	0.018	-0.012	0.009	0.005
diff. (Girls)-(Mixed)	-0.039*	-0.004	-0.007	0.016	0	-0.003	0.01
School location							
diff. (Rural)-(Urban)	-0.049*	-0.019	-0.032*	0.041**			-0.034**
Province/region							
diff. (Punjab)-(Sindh)	0.289***	0.207***	0.235***	0.246***	0.315***	0.169***	0.247***
diff. (Punjab)-(BL)	0.412***	-0.526***	-0.544***	-0.621***	-0.695***	0.558***	-0.575***
diff. (Punjab)-(KP)	0.179***	-0.109***	-0.124***	-0.121***	-0.098***	0.086***	-0.074***
diff. (Punjab)-(GB)	0.360***	-0.246***	-0.418***	-0.317***	-0.308***	0.254***	-0.238***
diff. (Punjab)-(AJK)	0.207***	-0.284***	-0.348***	-0.187***	-0.159***	0.217***	-0.181***
diff. (Punjab)-(ICT)	0.011	0.026	0.031	-0.047	-0.174***	0.074*	-0.013
diff. (Punjab)-(FATA)	0.400***	-0.309***	-0.252***	-0.247***	-0.216***	0.283***	-0.295***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 208 ASER: Availability of boundary wall, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	-0.123***	-0.132***	-0.051***	-0.040***	-0.009	0	0.011
School level							
diff. (Primary)-(Secondary)	-0.072***	-0.066***	-0.067***	-0.049***	-0.025*	-0.021	-0.003
diff. (Primary)-(High)	-0.065**	-0.052**	-0.068***	-0.059***	-0.029*	-0.037**	-0.016
diff. (Secondary)-(High)	0.006	0.014	-0.001	-0.01	-0.004	-0.016	-0.013
School gender							
diff. (Boys)-(Girls)	0.158***	-0.128***	-0.042*	0.008	-0.022	0.017	-0.016
diff. (Boys)-(Mixed)	0.03	0.142***	-0.032*	-0.005	-0.015	-0.007	-0.016
diff. (Girls)-(Mixed)	-0.128***	0.013	0.01	-0.014	0.008	-0.024	0
School location							
diff. (Rural)-(Urban)	-0.094**	-0.087**	-0.032	0.015			-0.040***
Province/region							
diff. (Punjab)-(Sindh)	0.179***	0.173***	0.176***	0.220***	0.284***	0.197***	0.231***
diff. (Punjab)-(BL)	0.324***	-0.474***	-0.424***	-0.379***	-0.509***	0.434***	-0.295***
diff. (Punjab)-(KP)	0.072***	-0.089***	-0.120***	-0.119***	-0.068***	0.039***	-0.041***
diff. (Punjab)-(GB)	0.280***	-0.248***	-0.309***	-0.275***	-0.260***	0.225***	-0.195***
diff. (Punjab)-(AJK)	0.488***	-0.517***	-0.531***	-0.518***	-0.266***	0.458***	-0.403***
diff. (Punjab)-(ICT)	-0.116*	0.027	0.037	-0.184***	-0.059	0.095**	-0.064*
diff. (Punjab)-(FATA)	0.200***	-0.211***	-0.149***	-0.141***	-0.127***	0.170***	-0.090***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 209 ASER: Availability of toilet, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	-0.045***	-0.044***	-0.01	-0.033***	0.006	0.006	0.008
School level							
diff. (Primary)-(Secondary)	-0.061***	-0.046**	-0.017	-0.028*	-0.022*	-0.004	-0.023
diff. (Primary)-(High)	-0.075***	-0.041*	-0.024	-0.027*	-0.027**	-0.021*	-0.032**
diff. (Secondary)-(High)	-0.014	0.005	-0.007	0.001	-0.006	-0.016	-0.009
School gender							
diff. (Boys)-(Girls)	0.036*	-0.049*	-0.02	0.016	-0.021	0.003	0.001
diff. (Boys)-(Mixed)	0.007	0.052***	-0.004	0.007	-0.002	0.004	0.007
diff. (Girls)-(Mixed)	-0.029	0.004	0.016	-0.009	0.019	0.001	0.006
School location							
diff. (Rural)-(Urban)	-0.058*	-0.062**	-0.004	0.005			-0.059***
Province/region							
diff. (Punjab)-(Sindh)	0.340***	0.292***	0.300***	0.320***	0.456***	0.395***	0.243***
diff. (Punjab)-(BL)	0.575***	-0.620***	-0.603***	-0.697***	-0.730***	0.719***	-0.621***
diff. (Punjab)-(KP)	0.200***	-0.176***	-0.145***	-0.173***	-0.110***	0.057***	-0.043***
diff. (Punjab)-(GB)	0.352***	-0.304***	-0.375***	-0.360***	-0.317***	0.265***	-0.206***
diff. (Punjab)-(AJK)	0.349***	-0.383***	-0.388***	-0.247***	-0.160***	0.257***	-0.166***
diff. (Punjab)-(ICT)	0.057	0.015	0.042	-0.022	-0.024	0.002	0.024
diff. (Punjab)-(FATA)	0.496***	-0.606***	-0.558***	-0.414***	-0.401***	0.444***	-0.288***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 210 ASER: Availability of playground, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	0.174***	0.167***	0.204***	0.164***	0.231***	0.121***	0.208***
School level							
diff. (Primary)-(Secondary)	-0.077**	-0.149***	-0.073**	-0.022	-0.012	-0.150***	-0.093**
diff. (Primary)-(High)	-0.210***	-0.274***	-0.124***	-0.116***	-0.119***	-0.218***	-0.055*
diff. (Secondary)-(High)	-0.134***	-0.125***	-0.051	-0.094***	-0.107***	-0.068*	0.038
School gender							
diff. (Boys)-(Girls)	-0.197***	0.006	-0.047	-0.126***	0.063	-0.160***	-0.122***
diff. (Boys)-(Mixed)	-0.159***	-0.208***	0.136***	-0.118***	0.192***	-0.077*	-0.111***
diff. (Girls)-(Mixed)	0.038	-0.202***	0.182***	0.008	0.130***	0.083*	0.011
School location							
diff. (Rural)-(Urban)	-0.053	0.128**	0.163***	0.178***			0.154***
Province/region							
diff. (Punjab)-(Sindh)	0.095***	0.124***	0.069***	0.086***	0.213***	0.136***	0.152***
diff. (Punjab)-(BL)	0.218***	-0.254***	-0.367***	-0.421***	-0.495***	0.570***	-0.418***
diff. (Punjab)-(KP)	0.148***	-0.161***	-0.195***	-0.120***	-0.241***	0.303***	-0.143***
diff. (Punjab)-(GB)	0.039	-0.028	-0.129***	-0.102***	-0.142***	0.120***	-0.045*
diff. (Punjab)-(AJK)	0.189***	-0.154***	-0.184***	-0.260***	-0.202***	0.273***	-0.046
diff. (Punjab)-(ICT)	0.028	-0.05	0.142*	0.16	0.214*	0.027	0.255***
diff. (Punjab)-(FATA)	0.304***	-0.274***	-0.284***	-0.264***	-0.436***	0.276***	-0.141***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 211 ASER: Availability of laboratory, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	0.070***	0.102***	0.105***	0.045*	0.106***	0.014	
School level							
diff. (Primary)-(Secondary)	-0.012	-0.037***	-0.034*	-0.051***	-0.059***	-0.052**	
diff. (Primary)-(High)	-0.475***	-0.537***	-0.517***	-0.524***	-0.595***	-0.556***	
diff. (Secondary)-(High)	-0.463***	-0.500***	-0.482***	-0.473***	-0.535***	-0.504***	
School gender							
diff. (Boys)-(Girls)	-0.142***	0.098**	0.06	-0.207***	0.094*	-0.104***	
diff. (Boys)-(Mixed)	-0.099***	-0.222***	0.183***	-0.110***	0.254***	-0.084**	
diff. (Girls)-(Mixed)	0.044	-0.125***	0.123***	0.097**	0.160***	0.021	
School location							
diff. (Rural)-(Urban)	-0.245***	-0.057	-0.117***	-0.081**			
Province/region							
diff. (Punjab)-(Sindh)	0.081***	0.069***	0.061***	0.055***	0.136***	0.179***	
diff. (Punjab)-(BL)	0.070***	-0.084***	-0.129***	-0.152***	-0.186***	0.202***	
diff. (Punjab)-(KP)	-0.087***	0.086***	0.073***	0.088***	-0.015	0.028	
diff. (Punjab)-(GB)	-0.080***	0.051*	0.043	-0.016	-0.029	0.011	
diff. (Punjab)-(AJK)	0.025	-0.001	-0.017	-0.041*	-0.049*	0.026	
diff. (Punjab)-(ICT)	-0.331***	0.210***	0.143**	0.461***	0.108	-0.026	
diff. (Punjab)-(FATA)	0.051*	-0.097***	-0.095***	-0.100***	-0.118***	0.095***	

*p<0.05, **p<0.01, ***p<0.001

Annex Table 212 ASER: Availability of computer lab, group-wise significance

	2012	2013	2014	2015	2016	2018	2019
School type							
diff. (Government)-(Private)	-0.005	0.012	0.016	0.055*	0.276***	0.028	0.097***
School level							
diff. (Primary)-(Secondary)	-0.087***	-0.103***	-0.144***	-0.175***		-0.116***	-0.103***
diff. (Primary)-(High)	-0.549***	-0.574***	-0.574***	-0.591***		-0.656***	-0.444***
diff. (Secondary)-(High)	-0.461***	-0.472***	-0.430***	-0.416***	-0.470***	-0.540***	-0.342***
School gender							
diff. (Boys)-(Girls)	-0.087***	0.082*	0.047	-0.220***	0.143**	-0.130***	-0.139***
diff. (Boys)-(Mixed)	-0.052	-0.156***	0.120***	-0.193***	0.366***	-0.124***	-0.178***
diff. (Girls)-(Mixed)	0.034	-0.074**	0.073**	0.027	0.222***	0.006	-0.039
School location							
diff. (Rural)-(Urban)	-0.281***	-0.141***	-0.169***	-0.153***			-0.180***
Province/region							
diff. (Punjab)-(Sindh)	0.149***	0.120***	0.121***	0.147***	0.157**	0.229***	0.115***
diff. (Punjab)-(BL)	0.202***	-0.216***	-0.215***	-0.271***	-0.355***	0.242***	-0.232***
diff. (Punjab)-(KP)	0.138***	-0.135***	-0.128***	-0.066***	-0.058	0.114***	-0.123***
diff. (Punjab)-(GB)	0.076**	-0.086***	-0.088***	-0.133***	-0.151***	0.033	-0.123***
diff. (Punjab)-(AJK)	0.090***	-0.111***	-0.112***	-0.183***	-0.249***	0.063**	-0.054*
diff. (Punjab)-(ICT)	-0.392***	0.185**	0.255***	0.423***	0.225	-0.210**	0.239***
diff. (Punjab)-(FATA)	0.196***	-0.231***	-0.219***	-0.237***	-0.312***	0.173***	-0.243***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 213 ASER: Availability of school facilities, significance over time

	Drinking water	Boundary wall	Toilet	Playground	Computer lab
	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)	diff. (2012)-(2019)
Overall	-0.020**	-0.083***	-0.024**	-0.073***	-0.038*
School type					
Government	-0.034***	-0.136***	-0.045***	-0.076***	-0.075***
Private	0.002	-0.001	0.008	-0.042	0.027
School level					
Primary	-0.028*	-0.124***	-0.055***	-0.122***	-0.062***
Secondary	-0.008	-0.055***	-0.017	-0.139***	-0.077**
High	-0.029*	-0.074***	-0.012	0.033	0.043
School gender					
Boys	-0.012	-0.020*	-0.015	-0.107***	0.011
Girls	-0.048***	-0.194***	-0.050**	-0.031	-0.041
Mixed	0.001	-0.066***	-0.015	-0.058	-0.115***
Location					
Rural	-0.017*	-0.081***	-0.017	-0.101***	-0.001
Urban	-0.001	-0.028**	-0.018**	0.105	0.1

*p<0.05, **p<0.01, ***p<0.001

E.12 Health and disability in the school

While previous rounds of the ASER dataset gather health and disability information from the household survey, the 2019 round gathers this information from the school survey. Data from this module is presented below.

The tables below show the number and percentage of schools in the sample that enrolled special children. For example, in 2019, around 19.9% of the sampled school have at least one special child.

Annex Table 214 ASER: Children with disabilities in school, 2019

	#	%
Overall	399	19.9
School type		
Government	277	22.0
Private	122	16.3
School level		
Primary	147	15.6
Secondary	99	23.9
High	128	22.3
Other	25	34.7
School gender		
Boys	203	18.7
Girls	105	22.2
Mixed	91	20.3
Location		
Rural	337	20.8
Urban	62	16.0
Province/region		
AJK	108	19.4
Balochistan	145	11.9
FATA	97	23.7
Gilgit-Baltistan	187	28.4
Islamabad-ICT	2	4.8
KPK	371	29.1
Punjab	399	19.9
Sindh	106	9.9

The school survey also gathers the number of special children enrolled, as shown in the tables below. Here, both the number of total children with disabilities and as a percentage of the school population is presented. For example, children with disabilities only made up 0.3% of student enrolment in this sample.

Annex Table 215 ASER: Number of children with disabilities in school, 2019

	Number			as % of total enrolled		
	Total	**Boys**	**Girls**	**Total**	**Boys**	**Girls**
Overall	1239	677	562	0.3	0.2	0.2
School type						
Government	772	466	306	0.3	0.2	0.1
Private	467	211	256	0.3	0.2	0.2
School level						
Primary	387	230	157	0.4	0.2	0.2
Secondary	409	198	211	0.4	0.2	0.2
High	398	222	176	0.2	0.1	0.1
Other	45	27	18	0.1	0.1	0.1
School gender						
Boys	631	413	218	0.4	0.2	0.1
Girls	395	246	149	0.3	0.2	0.2
Mixed	213	18	195	0.2	0.0	0.1
Location						
Rural	989	515	474	0.33	0.2	0.2
Urban	250	162	88	0.15	0.1	0.1
Province/region						
AJK	181	118	63	0.3	0.2	0.1
Balochistan	294	206	88	0.3	0.2	0.1
FATA	288	203	85	0.4	0.3	0.1
Gilgit-Baltistan	406	270	136	0.5	0.3	0.2
Islamabad-ICT	3	3	0	0.0	0.0	0.0
KPK	1291	1018	273	0.6	0.5	0.2
Punjab	1239	677	562	0.3	0.2	0.2
Sindh	180	113	67	0.1	0.1	0.1

Annex Table 216 ASER: Children with disabilities, significance, 2019

	School has special children	Number of special children			Special children (% of total enrolment)		
		Total	Boys	Girls	Total	Boys	Girls
School type							
diff. (Government)-(Private)	0.057**	-0.004	0.109	-0.095	-0.056	0.018	-0.07
School level							
diff. (Primary)-(Secondary)	-0.083***	-0.589	-0.256	-0.402	-0.008	0.049	-0.071
diff. (Primary)-(High)	-0.067**	-0.298	-0.155	-0.150*	0.194	0.131	0.077
diff. (Secondary)-(High)	0.016	0.29	0.102	0.252	0.202	0.083*	0.148
School gender							
diff. (Boys)-(Girls)	-0.024	-0.259	-0.121	-0.166	0.068	0.08	-0.016
diff. (Boys)-(Mixed)	-0.013	0.116	0.356*	-0.222**	0.198	0.212	0
diff. (Girls)-(Mixed)	0.012	0.375	0.477***	-0.056	0.13	0.133***	0.016
Location							
diff. (Rural)-(Urban)	0.041	-0.033	-0.077	0.099	0.189	0.108	0.109
Province/region							
diff. (Punjab)-(Sindh)	0.100***	0.459**	0.254**	0.239*	0.165	0.089	0.091
diff. (Punjab)-(BL)	-0.080***	-0.383**	-0.186*	-0.227*	-0.036	0.009	-0.055
diff. (Punjab)-(KP)	0.092***	0.404*	0.474**	-0.047	0.283*	0.298**	0.005
diff. (Punjab)-(GB)	0.085***	0.003	0.078	-0.057	0.22	0.171*	0.082
diff. (Punjab)-(AJK)	-0.005	-0.299	-0.136	-0.178	0.037	0.058	-0.017
diff. (Punjab)-(ICT)	-0.151*	-0.557	-0.289	-0.304	-0.275	-0.146	-0.146
diff. (Punjab)-(FATA)	0.038	0.091	0.161	-0.054	0.077	0.125	-0.04

*p<0.05, **p<0.01, ***p<0.001

Data is also collected on the disability friendly facilities in this round. More specifically, the school survey sheet records whether a schools has ramps, accessible toilets, health and nutrition officer, or other facilities to accommodate children with disabilities. For instance, in 2019, only 15.3% of sampled school had ramps as shown in the table below.

Annex Table 217 ASER: Disability friendly school facilities, 2019

	Ramps		Toilets		Health Officer		Other	
	No.	%	No.	%	No.	%	No.	%
Overall	75	15.3	109	21.4	56	5.6	76	15.7
School type								
Government	48	16.4	69	22.5	56	19.0	52	17.7
Private	27	13.6	40	19.7	0	0	24	12.6
School level								
Other	5	55.6	11	73.3	3	33.3	8	66.7
Primary	30	16	41	21.4	19	4.1	23	13.1
Elementary	19	35.8	25	47.2	14	7.0	22	44
Secondary	21	8.7	32	12.9	20	5.9	23	9.3
School gender								
Boys	40	17.1	59	24.5	21	2.9	44	18.7
Girls	13	10.7	24	18.2	16	10.6	19	15.4
Mixed	22	16.4	26	19.3	19	13.9	13	10.3
Location								
Rural	65	62.5	86	70.5	45	7.3	69	70.4
Urban	10	2.6	23	5.9	11	2.8	7	1.8
Province/region								
AJK	2	50	23	95.8	0	0	10	90.9
Balochistan	13	16	7	9.7	1	0.4	68	55.7
FATA	6	60	16	69.6	1	1.1	11	78.6
Gilgit-Baltistan	6	85.7	30	96.8	7	2.8	38	100
Islamabad-ICT	0	0	0	0	2	4.8	0	0
Khyber Pakhtunkhwa	31	16.4	161	53	13	2.2	94	38.2
Punjab	75	15.3	109	21.4	56	5.6	76	15.7
Sindh	11	3	14	3.9	2	0.4	11	3.1

Annex Table 218 ASER: Disability friendly school facilities, significance, 2019

	Ramps	Toilets	Health Officer	Other
School type				
diff. (Government)-(Private)	0.027	0.028	0.190***	0.051
School level				
diff. (Primary)-(Secondary)	-0.199**	-0.258***	-0.029	-0.309***
diff. (Primary)-(High)	0.072*	0.085*	-0.018	0.038
diff. (Secondary)-(High)	0.271***	0.343***	0.011	0.347***
School gender				
diff. (Boys)-(Girls)	0.076	0.079	-0.066***	0.066
diff. (Boys)-(Mixed)	0.017	0.069	-0.115***	0.096*
diff. (Girls)-(Mixed)	-0.058	-0.009	-0.049	0.03
Location				
diff. (Rural)-(Urban)	0.606***	0.642***	0.040**	0.691***
Province/region				
diff. (Punjab)-(Sindh)	0.122***	0.175***	0.051***	0.126***
diff. (Punjab)-(BL)	0.008	-0.117*	-0.052***	0.401***
diff. (Punjab)-(KP)	0.011	0.315***	-0.033**	0.225***
diff. (Punjab)-(GB)	0.704***	0.754***	-0.028	0.843***
diff. (Punjab)-(AJK)	0.347	0.744***	-0.056***	0.752***
diff. (Punjab)-(ICT)	-0.153*	-0.214**	-0.008	-0.157*
diff. (Punjab)-(FATA)	0.447***	0.482***	-0.045	0.629***

*p<0.05, **p<0.01, ***p<0.00

Annex F Education Indicators in MICS

F.1 Indicators and disaggregation

This document presents education indicators that have been derived from the MICS 2011, 2014 and 2017/18 dataset for the Punjab province. Some indicators have been calculated from the raw data to allow for a comparison with RESP statistics while the other indicators have been taken from the published MICS Survey Findings Reports.

Annex Table 219 MICS: List of indicators

RESP indicators	Indicators from Survey Report
Participation	Child nutrition and health
Enrolment/attendance [gross and net]	Early childhood development
Drop-out	Learning skills
	Parental involvement

A number of secondary variables are used to better understand the variation in education indicators. The following variables have been selected for this analysis:

F.1.1 Demographic variables

Age group and their corresponding class levels are shown in the table below. These cut-offs are used by the Academy of Educational Planning and Management (AEPAM) under the Ministry of Federal Education & Professional Training. AEPAM combines the EMIS datasets and publishes national education statistics.

Annex Table 220 MICS: Age groups and class levels

Age group	Class level
3-4 years	Pre-primary: Pre-school, Katchi, ECE
5-9 years	Primary: Classes 1-5
10-12 years	Middle: Classes 6-8
13-16 years	Secondary: Classes 9-12

Along with age, gender disaggregation is also available in the dataset.

F.1.2 Disability

The MICS records extensive data on disability in 2017/18 only. This information on health and functioning is collected in the questionnaire for children under five (disability module is administered for ages 2 and above only), the questionnaire for children ages 5 to 17 (administered at random to one child in the household that falls in this age bracket), and for household members 18 and above years of age in the household roster. Since the module for 5 to 17 years is only administered to a sample of the group, disability disaggregation have fewer observations. This module is based on the Washington Group on Disability Statistics' child functioning module. The functional domains covered include:

Annex Table 221 MICS: Functional domains by age

Age group	Functional domain
Under 5 years	Seeing, hearing, walking, fine motor, communication, learning, playing, and controlling behaviour
5 to 17 years	Seeing, hearing, walking, self-care, communication, learning, remembering, concentrating, accepting change, controlling behaviour, making friends, anxiety, and depression
18 and above years	Seeing, hearing, walking, self-care, communication, and remembering

Information on these domains is recorded on different scales and categorized, as shown below. A child or adult is reported as having functional difficulty if the guardian reports functional difficulty in at least one domain. In the RESP, analysis is over none, mild to moderate and severe disability. However, the MICS published statistics themselves discuss disability as a binary variable.

Annex Table 222 MICS: Categorization of functional domains

Functional domain	Scale in the MICS survey	Categorized in the MICS as	Categorized in the RESP as
Seeing, hearing, walking, fine motor, self-care, communication, learning, playing, remembering, concentrating, accepting change, controlling behaviour, making friends	1 – no difficulty 2 – some difficulty 3 – a lot of difficulty 4 – cannot do X at all	No difficulty = 1 & 2 Functional difficulty = 3 & 4	No difficulty = 1 Mild to moderate difficulty = 2 & 3 Severe difficulty = 4
Anxiety Depression	1 – Daily 2 – Weekly 3 – Monthly 4 – A few times a year 5 – Never	No difficulty = 2 - 5 Functional difficulty = 1	No difficulty = 5 Mild to moderate difficulty = 2 - 4 Severe difficulty = 1
Controlling behaviour (2-4 years)	1 – Not at all 2 – Less 3 – The same 4 – More 5 – A lot more	No difficulty = 1 - 4 Functional difficulty = 5	No difficulty = 1 Mild to moderate difficulty = 2 - 4 Severe difficulty = 5

F.1.3 School Type

The MICS survey provides detailed information on type of school. The categories for school type are government school, private school, religious/missionary school (referred to as madrassa here) and other. School type information is only available for the primary classes and above.

F.1.4 Wealth Index

To understand inequality, MICS gathers extensive data on household characteristics which are used to construct a wealth index. The MICS raw data already contains a composite indicator of wealth. Information on dwelling characteristics, ownership of consumer goods, water and sanitation facilities,

energy for cooking, heating and lighting, and other factors related to household wealth are used to construct this index.[61] Each household is assigned a wealth score according to the weights assigned to each of the assets through principal component analysis. In 2014 and 2017/18 further steps are taken to minimize the bias of urban households in the wealth index. Each household is ranked based on their wealth score and divided into equal quintiles. The wealth index has been divided into quintiles, with '1' representing the poorest quintile and '5' representing the richest quintile.

F.1.5 Geographical variables

To understand spatial variation, urban/rural variables are also included in this analysis.

F.2 Participation

The participation rate measures how many children report they are currently attending school, in comparison to the remaining population. This variable has been calculated from the question "at any time during the current school year, did child attend school or pre-school programme?"

PR = [children 5-16 years who attend school in the currently school year] / [all children aged 5-16 years]

…where all children includes those that currently enrolled in school, those who never enrolled in school and those that previously attended school but are currently not attending.

F.2.1 Overall participation tables

These tables provide overall participation rates and by age, gender, disability, wealth quintiles and urban/rural. For instance, in 2011, 71.9% of the children aged 5-16 years were enrolled in schools. The remainder of the table provides participation rate over various categories.

Moreover, column percentages have been calculated under the school type category as that information is only available for school-going children. This means that of the children that are participating in schools, 63.4% go to government schools in 2011.

[61] The wealth index will be missing if the household has missing information on any one of these variables.

Annex Table 223 MICS: Participation rate

	2011		2014		2017/18	
	#	%	#	%	#	%
Overall	126229	71.9	52219	73.9	72539	78.6
Age group						
5-9 years	59579	77.0	25178	80.1	36170	85.3
10-12 years	34291	77.8	13903	78.9	19000	82.8
13-16 years	32359	59.8	13138	60.8	17369	64.6
Gender						
Female	57661	68.0	24279	70.9	34440	76.5
Male	68568	75.5	27940	76.7	38095	80.7
Child's functional difficulty						
None					8948	80.2
Mild to moderate					15871	81.0
Severe					1389	67.8
Total					26208	79.9
Wealth index quintile						
1st (poorest)	18416	45.6	7862	47.4	13134	58.3
2nd	25553	67.4	10669	70.6	15252	77.1
3rd	27788	79.0	11365	81.0	14970	84.6
4th	28030	84.4	11591	87.2	15281	88.5
5th (richest)	26442	91.3	10732	92.2	13902	92.8
Location						
Rural	86865	68.0	33794	69.4	45580	75.4
Urban	39364	82.3	18424	83.9	26959	84.8
Share by school type						
Government	68497	63.4	26439	60.7	35060	61.0
Private	39257	36.3	17097	39.2	21902	38.1
Madrassa	237	0.2	-	-	412	0.7
Other	44	0	39	0.1	90	0.2
Total	108036	100	43574	100	57464	100

F.2.2 Group-wise significance

The tables below show the difference in participation rates over various groups – age, gender, disability, wealth and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 224 MICS: Participation rate, group-wise significance

	2011	2014	2017/18
Age group			
diff. (5-9 yrs)-(10-12 yrs)	-0.009*	0.012**	0.025***
diff. (5-9 yrs)-(13-16 yrs)	0.172***	0.193***	0.207***
diff. (10-12 yrs)-(13-16yrs)	0.181***	0.181***	0.182***
Gender			
diff. (Female) - (Male)	-0.075***	-0.058***	-0.042***
Child's functional difficulty			
diff. (none)-(mild to moderate)			-0.008
diff. (none)-(severe)			0.124***
diff. (mild to moderate)-(severe)			0.133***
Wealth index quintile			
diff. (1)-(2)	-0.217***	-0.232***	-0.187***
diff. (1)-(3)	-0.334***	-0.336***	-0.262***
diff. (1)-(4)	-0.388***	-0.398***	-0.302***
diff. (1)-(5)	-0.456***	-0.448***	-0.345***
diff. (2)-(3)	-0.116***	-0.103***	-0.075***
diff. (2)-(4)	-0.170***	-0.166***	-0.115***
diff. (2)-(5)	-0.239***	-0.215***	-0.157***
diff. (3)-(4)	-0.054***	-0.063***	-0.040***
diff. (3)-(5)	-0.122***	-0.112***	-0.082***
diff. (4)-(5)	-0.068***	-0.049***	-0.043***
Location			
diff. (Rural) - (Urban)	-0.143***	-0.145***	-0.095***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in participation between the earliest and latest rounds, and over various groups.

Annex Table 225 MICS: Participation rate, significance over time

	diff. (2011) - (2017)
Overall	-0.067***
Age group	
5-9 years	-0.083***
10-12 years	-0.050***
13-16 years	-0.048***
Gender	
Female	-0.085***
Male	-0.052***

Wealth index quintile	
1st (poorest)	-0.127***
2nd	-0.097***
3rd	-0.055***
4th	-0.041***
5th (richest)	-0.015**
Location	
Rural	-0.074***
Urban	-0.025***

*p<0.05, **p<0.01, ***p<0.001

F.3 Gross enrolment ratio (GER)

The enrolment/attendance indicators have been calculated as per the formulas identified in the RESP exercise. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely the current class the child is enrolled in (participation indicator looks at broader school attendance irrespective of class levels).

The gross enrolment ratio (GER) is participation in schooling by educational level. The formula for primary GER is:

GER = [number of children in primary school (classes 1-5)] / [total population of children at primary age (ages 5-9)]

It is important to note here that while GER includes everyone at a certain level of education regardless of age, the MICS survey records education information on children aged 3 to 24 years only. Since children above the age of 24 years are not in the sample, it can be assumed that actual GER might be higher for the secondary schooling levels than calculated below.

Furthermore, disability information is gathered for under 5 year olds, 5 to 17 years and 18 and above years. Adult disability (18 and above years) has not been used in the GER calculations was the list of functionalities are different to those available for 5 to 17 years.

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary GER is calculated as the number of children at the primary level in government schools over the number of children at primary age in school. This means that the school type numbers provide the share of total GER. Information by school type is only available for primary grades and above.

F.3.1 Overall GER

The tables below show GERs by pre-primary, primary, middle and secondary over certain categories. For instance, in 2017 the overall pre-primary GER is 115.6%. The remaining percentages are absolute values in that they provide GERs for specific groups. Primary GER in rural areas is 87.5% in comparison to 95.3% in urban areas in 2017.

The school type disaggregation together equal the overall GER numbers. While overall primary GER is 90.1% in 2017/18, the government share of primary GER is 53.2%.

Annex Table 226 MICS: Pre-primary GER (%)

	2011	2014	2017/18
Overall	79.4	96.0	115.6
Gender			
Male	84.6	101.2	120.0
Female	74.0	90.8	111.0
Child's functional difficulty			
None			78.6
Mild to Moderate			64.3
Severe			75.9
Wealth index quintile			
1st (poorest)	56.0	72.3	116.0
2nd	80.1	101.1	120.1
3rd	87.7	102.1	115.6
4th	89.5	105.7	111.6
5th (richest)	91.7	106.6	114.3
Location			
Rural	74.9	91.6	114.5
Urban	91.7	106.1	117.7

Annex Table 227 MICS: Primary (class 1-5) GER (%)

	2011	2014	2017/18
Overall	89.2	86.4	90.1
Gender			
Male	93.6	90.0	93.3
Female	84.4	82.7	86.8
Child's functional difficulty			
None			87.5
Mild to Moderate			83.3
Severe			67.9
Wealth index quintile			
1st (poorest)	60.0	57.5	68.7
2nd	90.1	89.4	95.5
3rd	102.0	100.3	98.9
4th	105.0	100.1	101.4
5th (richest)	101.3	96.9	94.4
Location			

Rural	85.8	82.5	87.5
Urban	99.0	95.9	95.3
Share of school type			
Government	55.3	50.2	53.2
Private	33.5	36.1	34.2
Madrassa	0.2		0.7
Other	0.1	0.1	0.1

Annex Table 228 MICS: Middle (class 6-8) GER (%)

	2011	2014	2017/18
Overall	60.0	60.1	57.2
Gender			
Male	61.8	62.5	58.2
Female	57.9	57.5	56.2
Child's functional difficulty[62]			
None			73.5
Mild to Moderate			60.3
Severe			55.8
Wealth index quintile			
1st (poorest)	24.1	24.7	25.4
2nd	49.9	51.6	53.3
3rd	69.9	70.3	70.4
4th	78.3	80.3	72.5
5th (richest)	91.1	87.9	79.5
Location			
Rural	54.6	53.9	52.2
Urban	74.3	73.8	66.8
Share of school type			
Government	39.8	39.2	36.6
Private	19.9	20.7	18.7
Madrassa	0.2		0.4
Other	0.0	0.1	0.1

[62] Middle and Secondary GER have to be interpreted with caution as not every children 5-17 years was administered the disability module. Since the denominator is low due to limited observations, the GER for Secondary and No disability, for instance, is artificially high.

Annex Table 229 MICS: Secondary (class 9-12) GER (%)

	2011	2014	2017/18
Overall	47.2	52.5	54.9
Gender			
Male	51.8	55.4	56.0
Female	42.4	49.5	53.7
Child's functional difficulty[63]			
None			155.6
Mild to Moderate			49.3
Severe			36.6
Wealth index quintile			
1st (poorest)	12.3	14.3	14.5
2nd	28.5	34.1	37.0
3rd	46.0	52.4	57.1
4th	62.9	70.0	73.9
5th (richest)	90.4	98.6	104.2
Location			
Rural	39.2	44.2	45.3
Urban	66.2	69.5	71.8
Share of school type			
Government	30.2	33.6	30.1
Private	16.6	18.9	21.3
Madrassa	0.2		0.4
Other	0.1	0.1	0.2

F.3.2 Gender disaggregation

The tables below provide gender disaggregated GERs for primary, middle and secondary levels. The tables provides enrolment statistics by wealth and urban/rural, and gender. For instance in 2011, primary GER in urban areas is 100.2% among boys and 97.8% among girls.

School type disaggregation together equal the overall GER number for girls and boys. While overall primary GER for boys is 93.3%, the government share of primary GER for boys is 57.3% in 2011.

[63] ibid.

Annex Table 230 MICS: Primary GER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	71.3	47.6	66.5	47.8	76.9	60.2
2nd	94.8	85.1	92.1	86.4	97.8	93.2
3rd	104.5	99.5	102.2	98.2	100.9	96.8
4th	105.4	104.5	102.2	98.0	101.1	101.6
5th (richest)	101.9	100.6	97.2	96.7	95.8	92.9
Location						
Rural	91.4	79.8	87.5	77.1	92.0	82.9
Urban	100.2	97.8	96.0	95.8	95.9	94.7
Share of school type						
Government	57.3	53.0	51.0	49.4	52.9	53.6
Private	35.8	31.0	38.9	33.1	37.7	30.7
Madrassa	0.2	0.1			0.7	0.6
Other	0.0	0.1	0.1	0.1	0.1	0.1

Annex Table 231 MICS: Middle GER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	32.4	13.7	33.4	15.1	32.5	17.6
2nd	55.5	43.6	57.9	44.6	57.4	48.8
3rd	69.1	70.8	69.2	71.5	68.0	73.1
4th	75.2	81.6	74.8	86.3	69.3	75.7
5th (richest)	90.8	91.4	90.0	85.8	76.2	82.9
Location						
Rural	58.1	50.6	58.3	49.0	55.1	49.1
Urban	71.9	76.9	71.9	76.0	64.3	69.5
Share of school type						
Government	41.8	37.6	40.6	37.7	37.0	36.0
Private	19.7	20.1	21.7	19.7	19.0	18.4
Madrassa	0.2	0.1			0.4	0.3
Other	0.0	0.0	0.1	0.0	0.1	0.1

Annex Table 232 MICS: Secondary GER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	19.3	4.8%	21.5	6.6	20.0	8.8
2nd	38.0	19.1%	43.2	24.8	41.4	32.3
3rd	52.1	39.9%	54.1	50.6	57.0	57.3
4th	62.6	63.1%	67.8	72.4	69.8	77.9
5th (richest)	90.4	90.3%	96.5	100.9	102.7	105.7
Location						
Rural	46.1	32.3%	49.7	38.4	48.6	41.9
Urban	65.2	67.4%	67.0	72.0	69.3	74.5
Share of school type						
Government	34.3	26.0	35.5	31.6	30.7	29.5
Private	17.2	16.0	19.8	17.9	21.9	20.6
Madrassa	0.2	0.2			0.3	0.6
Other	0.1	0.1	0.0	0.1	0.2	0.2

F.4 Net enrolment ratio (NER)

The enrolment/attendance indicators have been calculated as per the formulas identified in the RESP exercise. While this indicator is similar to participation, it has been calculated from a different variable in the dataset – namely the current class the child is enrolled in (participation indicator looks at broader school attendance irrespective of class levels).

Net enrolment ratio (NER) is participation in schooling by both age and educational level. The formula for primary NER is:

NER = [number of children at primary age in primary school (ages 5-9 & classes 1-5)] / [total population of children at primary age (ages 5-9)]

With the school type disaggregation the formula is slightly different as the denominator (total children at primary age) cannot be divided by school type. For example, government primary NER is calculated as the number of children at the primary level, in government schools and of primary age, over the number of children at primary age going to school. This means that the school type numbers provide the share of total NER. Information by school type is only available for primary grades and above.

F.4.1 Overall NER

The tables below show NERs by pre-primary, primary, middle and secondary over certain categories. For instance, in 2017/18 the overall pre-primary NER is 32.9%. The remaining percentages are absolute value in that they provide NERs for specific groups. For instance, pre-

primary NER for girls is 32.9% in 2017/18. The school type disaggregation provides the share of overall NER.

Annex Table 233 MICS: Pre-primary NER (%)

	2011	2014	2017/18
Overall	21.1	28.9	32.9
Gender			
Male	21.9	28.7	32.8
Female	20.4	29.2	32.9
Child's functional difficulty			
None			36.6
Mild to moderate			32.1
Severe			26.7
Wealth index quintile			
1st (poorest)	6.8	11.1	21.1
2nd	14.9	22.1	30.5
3rd	22.7	30.6	35.7
4th	29.5	39.1	37.9
5th (richest)	37.9	48.5	42.8
Location			
Rural	17.2	24.7	31.4
Urban	31.6	38.4	35.8

Annex Table 234 MICS: Primary NER (%)

	2011	2014	2017/18
Overall	53.7	53	53.4
Gender			
Male	54.9	53.5	53.2
Female	52.4	52.5	53.5
Child's functional difficulty			
None			54
Mild to moderate			51.5
Severe			42.4
Wealth index quintile			
1st (poorest)	32.6	30.5	36.0
2nd	50.9	50.5	53.8
3rd	60.5	61.2	59.6
4th	65.8	65.3	62.3

5th (richest)	69.4	68.5	63.4
Location			
Rural	50.6	49.3	51.4
Urban	62.5	61.7	57.2
Share of school type			
Government	31.1	28.3	29.5
Private	22.3	24.6	22.7
Madrassa	0.1		0.3
Other	0	0	0.1

Annex Table 235 MICS: Middle NER (%)

	2011	2014	2017/18
Overall	24.7	26.6	23.3
Gender			
Male	24.5	26.0	22.5
Female	24.9	27.2	24.2
Child's functional difficulty			
None			25.7
Mild to moderate			24.9
Severe			18.4
Wealth index quintile			
1st (poorest)	8.2	9.1	8.5
2nd	18.2	20.6	19.0
3rd	27.0	29.2	26.9
4th	32.6	35.6	30.7
5th (richest)	44.5	46.8	39.6
Location			
Rural	21.4	22.7	20.6
Urban	33.4	35.0	28.4
Share of school type			
Government	15.3	16.1	13.7
Private	9.3	10.4	9.1
Madrassa	0		0.1
Other	0	0	0

Annex Table 236 MICS: Secondary NER (%)

	2011	2014	2017/18
Overall	25.4	28.7	29.2
Gender			
Male	26.9	28.9	28.6
Female	23.9	28.4	29.9
Child's functional difficulty			
None			32.3
Mild to moderate			33.3
Severe			24.2
Wealth index quintile			
1st (poorest)	6.6	8.0	8.0
2nd	15.3	18	20.4
3rd	24.6	27.3	30.2
4th	33.9	39.8	39.2
5th (richest)	49.1	54.1	54.8
Location			
Rural	20.9	23.4	24.6
Urban	36.3	39.4	37.4
Share of school type			
Government	16.4	18.5	16.8
Private	8.9	10.1	11.6
Madrassa	0.1		0.2
Other	0	0	0

F.4.2 Gender disaggregation

The tables below provide gender disaggregated NERs for primary, middle and secondary levels. The table provides enrolment statistics by wealth index and urban/rural, and gender. For instance in 2011, primary NER in urban areas is 62.1% for boys and 63.0% for girls.

School type disaggregation together equal the overall NER number for girls and boys. While overall primary NER for girls is 52.4%, the government share of primary NER for girls is 31.5% in 2011.

Annex Table 237 MICS: Primary NER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	37.2	27.6	34.2	26.5	38.4	33.5
2nd	52.7	49.0	51.4	49.4	53.0	54.6
3rd	60.6	60.4	60.8	61.6	59.0	60.2
4th	64.8	66.8	64.2	66.5	60.8	63.9
5th (richest)	68.6	70.3	66.8	70.3	61.9	64.9
Location						
Rural	52.4	48.7	50.4	48.1	51.8	51.1
Urban	62.1	63.0	60.7	62.8	56.0	58.4
Share of school type						
Government	31.5	30.7	27.7	28.9	28.1	31.0
Private	23.0	21.5	25.7	23.4	23.9	21.3
Madrassa	0.1	0.1			0.3	0.4
Other	0.0	0.0	0.0	0.0	0.1	0.1

Annex Table 238 MICS: Middle NER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	10.8	5.0	12.0	5.8	10.8	6.1
2nd	20.0	16.3	22.3	18.7	19.7	18.3
3rd	26.7	27.3	27.5	31.0	25.0	28.9
4th	30.4	35.0	32.0	39.6	28.2	33.2
5th (richest)	41.7	47.4	43.5	50.1	35.5	43.9
Location						
Rural	22.1	20.6	23.0	22.5	20.5	20.8
Urban	30.9	36.1	32.7	37.5	26.3	30.6
Share of school type						
Government	15.5	15.0	15.8	16.5	13.1	14.3
Private	8.9	9.9	10.2	10.6	8.9	9.4
Madrassa	0.1	0.0			0.1	0.1
Other	0.0	0.0	0.0	0.0	0.0	0.0

Annex Table 239 MICS: Secondary NER (%) by gender

	2011		2014		2017/18	
	Male	Female	Male	Female	Male	Female
Wealth index quintile						
1st (poorest)	10.1	2.8	11.6	4.1	10.7	5.2
2nd	19.8	10.8	21.5	14.3	22.2	18.5
3rd	26.9	22.3	26.5	28.2	28.4	32.0
4th	33.2	34.6	38.0	41.6	35.1	43.4
5th (richest)	46.2	52.2	50.0	58.6	52.3	57.5
Location						
Rural	23.8	18.0	25.1	21.5	25.5	23.7
Urban	34.1	38.5	36.7	42.3	34.3	40.6
Share of school type						
Government	18.1	14.7	18.9	18.1	16.6	16.9
Private	8.6	9.1	10.0	10.2	11.3	11.9
Madrassa	0.1	0.1			0.1	0.3
Other	0.0	0.0	0.0	0.0	0.0	0.0

F.5 Drop-out rate

Since the MICS gathers cross-sectional (and not time series) data, drop-out cannot be calculated directly. Similar to the participation indicator, the drop-out rate measures how many children have previously attended school in comparison to the remaining population. This variable has been calculated from the questions “at any time during the current school year, did child attend school or pre-school programme?”, “at any time during the previous school year, did child attend school or pre-school programme?” and “has child ever attended school or pre-school programme?” A child is recorded as a drop-out if they previously went to school (either last year or before that) but are currently not in school.

DR = [children aged 5-16 years who previously attended school but are currently not in school] / [all children aged 5-16 years]

…where all children includes those that currently enrolled in school, those who never enrolled in school and those that previously attended school but are currently not in school.

F.5.1 Overall drop-out rate

The table provides an overall drop-out rate and further disaggregation of this rate by age, gender, disability, wealth quintiles and urban/rural. For instance the overall drop-out rate for children aged 5-16 years is 8.9% in 2011. The remainder of the table provides drop-out rate over different categories. For instance, drop-out rate among girls is 9.3% in 2011.

Annex Table 240 MICS: Drop-out rate

	2011		2014		2017/18	
	#	%	#	%	#	%
Overall	15582	8.9	6953	9.8	9306	10.1
Age group						
5-9 years	732	0.9	419	1.3	907	2.1
10-12 years	2821	6.4	1335	7.6	1855	8.1
13-16 years	12030	22.2	5198	24.1	6544	24.3
Gender						
Female	7850	9.3	3427	10.0	4481	9.9
Male	7732	8.5	3526	9.7	4824	10.2
Child's functional difficulty						
None					1116	10.0
Mild to moderate					1810	9.2
Severe					235	11.4
Total					3160	9.6
Wealth index quintile						
1st (poorest)	3452	8.6	1776	10.7	3080	13.7
2nd	4178	11.0	1957	13.0	2438	12.3
3rd	3562	10.1	1538	11.0	1714	9.7
4th	2849	8.6	1074	8.1	1320	7.6
5th (richest)	1542	5.3	608	5.2	753	5.0
Location						
Rural	11680	9.1	5031	10.3	6520	10.8
Urban	3903	8.2	1921	8.7	2786	8.8

F.5.2 Group-wise significance

The table below show the difference in drop-out rates over various groups – age, gender, disability, wealth and rural/urban. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 241 MICS: Drop-out rate, group-wise significance

	2011	2014	2017/18
Age group			
diff. (5-9 yrs)-(10-12 yrs)	-0.055***	-0.062***	-0.059***
diff. (5-9 yrs)-(13-16 yrs)	-0.213***	-0.227***	-0.223***
diff. (10-12 yrs)-(13-16yrs)	-0.158***	-0.165***	-0.163***
Gender			
diff. (Female) - (Male)	0.007***	0.003	-0.003

Child's functional difficulty			
diff. (none)-(mild to moderate)			0.008*
diff. (none)-(severe)			-0.014
diff. (mild to moderate)-(severe)			-0.022**
Wealth index quintile			
diff. (1)-(2)	-0.025***	-0.022***	0.014**
diff. (1)-(3)	-0.016***	-0.002	0.040***
diff. (1)-(4)	-0.000	0.026***	0.060***
diff. (1)-(5)	0.032***	0.055***	0.087***
diff. (2)-(3)	0.009**	0.020***	0.026***
diff. (2)-(4)	0.024***	0.049***	0.047***
diff. (2)-(5)	0.057***	0.078***	0.073***
diff. (3)-(4)	0.015***	0.029***	0.020***
diff. (3)-(5)	0.048***	0.057***	0.047***
diff. (4)-(5)	0.033***	0.029***	0.026***
Location			
diff. (Rural) - (Urban)	0.010***	0.016***	0.020***

*p<0.05, **p<0.01, ***p<0.001

The table below shows the difference in drop-out between the earliest and latest rounds, and over various groups.

Annex Table 242 MICS: Drop-out rate, significance over time

	diff. (2011) - (2017)
Overall	-0.012***
Age group	
5-9 years	-0.012***
10-12 years	-0.017***
13-16 years	-0.021***
Gender	
Female	-0.007**
Male	-0.017***
Wealth index quintile	
1st (poorest)	-0.051***
2nd	-0.013***
3rd	0.004
4th	0.009**
5th (richest)	0.003
Location	
Rural	-0.016***
Urban	-0.006*

*p<0.05, **p<0.01, ***p<0.001

F.6 Early Childhood Development

The MICS gathers detailed information on early childhood development through a questionnaire for children under 5, administered to mothers. This section provides a selection of MICS indicators provided in the MICS Survey Findings Reports. The following indicators are presented:

Annex Table 243 MICS: Indicators from published reports

Early Childhood Development Indicators
Child nutrition status (children under 5); minimum acceptable diet (children 6-23 months); immunization prevalence (children 12-23 months)
ECE Participation Rate (children 36-59 months)
Children attending first grade of primary school who attended pre-school in the previous year
Early child development index (children 3-4 years)
Support for learning in household (children 2-4 years; children 3-4 years)
Availability of learning materials in household (children under 5 years)

F.6.1 Child nutrition and health

The MICS survey, through the children under 5 questionnaire, collects extensive health and nutrition information for children. Selected indicators are discussed below.

Anthropometric measurements collected in this data source allow for the calculation of the nutritional status of children. Using WHO growth standards, a child is categorized as being moderately or severely underweight, stunted or wasted if the child's weight-for-age, height-for-age, and weight-for-height is two standard deviations below the medians of the reference well-nourished population, respectively. The table below shows the prevalence of underweight, stunting and wasting among for children under 5. In 2017, for instance, 21.2% of children under 5 are underweight.

Annex Table 244 MICS: Nutrition status of children (under 5 years), moderate and severe (%)

	Underweight			Stunting			Wasting		
	2011	2014	2017/18	2011	2014	2017/18	2011	2014	2017/18
Overall	32.6	33.7	21.2	36.0	33.5	31.5	15.7	17.5	7.5
Gender									
Male	33.1	33.9	21.9	36.9	33.9	32.1	17.1	18.2	8.3
Female	32.0	33.4	20.4	35.1	33.1	30.9	14.3	16.1	6.5
Wealth index quintile									
1st (poorest)	44.9	47.7	32.6	49.3	49.4	48.5	19.0	21.4	8.9
2nd	38.2	39.0	24.5	42.5	39.4	36.7	17.3	18.7	7.9
3rd	31.4	32.2	18.1	34.7	31.1	27.4	15.2	18.5	7.4
4th	26.5	28.0	16.3	29.3	26.3	24.0	14.0	15.7	6.7
5th (richest)	18.7	17.3	11.8	20.8	16.9	17.0	12.1	12.2	6.1
Location									
Rural	35.0	36.3	22.6	38.8	36.7	34.3	16.0	18.8	7.6
Urban	26.4	27.7	18.3	28.9	26.3	26.0	14.8	16.2	7.1

Source:	Table NU.1: Nutrition status of children from MICS 2011 Survey Findings Report; Table NU.2: Nutritional status of children from MICS 2014 Survey Findings Report; Table TC.8.1: Nutritional status of children from MICS 2017-2018 Survey Findings Report

The MICS measures infant and young child feed practices such as breastfeeding and introducing of liquid, solid, semi-solid and soft foods at the appropriate age. One such measurement is called the minimum acceptable diet and includes the minimum meal frequency and diet diversity (number of food groups), with slight differences by breastfeeding status. More specifically, the minimum acceptable diet for children 6-23 months in the previous day includes:

a. appropriate number of meals/snacks/milk feeds

b. food items from 4 out of 7 food groups in 2014; food items from 4 out of 7 food groups for non-breastfed children, and 5 out of 8 food groups for breastfed children in 2017

c. breastmilk or at least 2 milk feeds for non-breastfed children

The table below shows that in 2017, 14% of breastfed children had a minimum acceptable diet in the previous day.

Annex Table 245 MICS: Minimum acceptable diet for children (6-23 months) by breastfeeding status (%)

	Breastfed children		Non-breastfed children	
	2014	**2017/18**	**2014**	**2017/18**
Overall	11.2	14.0	7.3	9.3
Gender				
Male	11.1	13.6	9.1	8.9
Female	11.3	14.4	5.3	9.7
Wealth index quintile				
1st (poorest)	5.5	7.9	3.5	3.4
2nd	7.4	12.3	3.8	5.4
3rd	10.7	14.0	6.4	10.9
4th	14.3	16.2	8.5	11.3
5th (richest)	21.6	22.0	13.0	14.6
Location				
Rural	8.9	12.9	6.0	8.6
Urban	16.7	16.3	9.9	10.6
Source:	Table NU.8: Infant and young child feeding (IYCF) practices from MICS 2014 Survey Findings Report; Table TC.7.7: Infant and young child feeding (IYCF) practices from MICS 2017-2018 Survey Findings Report			

One measure of child health is vaccination prevalence for preventable childhood diseases. The MICS collects immunization information for children under 3 years. Information is recorded through vaccination cards or mother's report. The table below shows the percentage of children 12-23 months with full basic immunization. These basic antigens include BCG, Polio3, PENTA3 (DTP3,

HepB3, Hib3) and Measles, according to the Health department along with UNICEF and WHO guidelines.

Annex Table 246 MICS: Immunization of children (12-23 months)

	2011	2014	2017/18
Overall	46.8	62.3	76.5
Gender			
Male	46.7	63.7	78.1
Female	47.0	60.7	74.7
Wealth index quintile			
1st (poorest)	32.9	42.2	66.5
2nd	41.3	58.8	77.7
3rd	49.5	67.8	81.6
4th	53.6	70.5	80.1
5th (richest)	57.8	74.1	77.2
Location			
Rural	44.8	59.8	77.3
Urban	51.9	68.0	74.9
Source:	Table CH.2: Vaccination by background characteristics from MICS 2011 Survey Findings Report; Table CH.2: Vaccination by background characteristics from MICS 2014 Survey Findings Report; Table from MICS 2017-2018 Survey Findings Report		

F.6.2 Participation in ECE

The participation rate in early childhood education (ECE) measures how many children report currently attending school before the primary grade, in comparison to the remaining population. This variable has been calculated from the question “at any time during the current school year, did child attend school or pre-school programme?” in the household module.

PR = [children 3-4 years who attend school in the current school year] / [all children aged 3-4 years]

…where all children includes those that currently enrolled in school, those who never enrolled in school and those that previously attended school but are currently not attending.

These tables provide overall ECE participation rates and by gender, disability, wealth quintiles and urban/rural. For instance, in 2017, 34.5% of the children aged 3-4 years are participating in some form of organised learning.

Annex Table 247 MICS: Participation rate (children 3-4 years)

	2011		2014		2017/18	
	#	%	#	%	#	%
Overall	7213	24.3	3930	31.0	5766	34.5
Gender						
Female	3429	23.6	1963	31.2	2837	34.7
Male	3784	24.9	1966	30.8	2929	34.3
Child's functional difficulty						
None					1674	38.7
Mild to moderate					3617	33.4
Severe					194	28.1
Wealth index quintile						
1st (poorest)	585	8.0	382	12.2	882	22.0
2nd	1070	17.6	612	24.1	1093	32.6
3rd	1514	26.9	774	33.1	1199	37.7
4th	1813	33.4	1001	41.7	1287	39.8
5th (richest)	2232	42.4	1160	50.8	1306	44.1
Location						
Rural	4393	20.3	2342	26.7	3633	33.0
Urban	2820	35.0	1588	40.6	2133	37.3

The table below shows the school readiness of children currently in grade 1. This variable has been calculated by combining questions on grade in the current and previous school year from the household questionnaire. This table provides overall school readiness and by gender, disability, wealth quintiles and urban/rural. For instance, in 2017, 90.6% of the children in grade 1 had attended some form of early childhood education program before.

Annex Table 248 MICS: Children attending first grade of primary school and attended pre-school in the previous year

	2011		2014		2017/18	
	%	# of grade 1 children	%	# of grade 1 children	%	# of grade 1 children
Overall	79.0	15392	92.5	6231	90.6	8953
Gender						
Male	78.3	8462	92.5	3310	90.6	4641
Female	79.8	6930	92.6	2921	90.7	4312
Child's functional difficulty						
Has difficulty					88.3	569
No difficulty					90.5	2905
Wealth index quintile						
1st (poorest)	70.1	3120	90.0	1103	89.9	1949
2nd	73.8	3366	92.3	1373	91.0	2069
3rd	81.2	3367	90.9	1396	91.1	1810
4th	85.1	3066	94.9	1280	90.7	1730

5th (richest)	86.7	2472	94.8	1078	90.5	1395
Location						
Rural	76.9	11310	91.9	4187	91.3	5958
Urban	84.8	4082	93.9	2044	89.3	2995
Source:	Table ED.2: School Readiness from MICS 2011 Survey Findings Report; Table ED.2: School Readiness from MICS 2014 Survey Findings Report; Table LN.2.1: School Readiness from MICS 2017-2018 Survey Findings Report					

F.6.3 Early child development index

MICS uses a 10-item module to calculate the early child development index (ECDI) to measure the development status of children in Pakistan. Children at the ages of 3 and 4 years are expected to reach the milestones mentioned below. “The 10 items are used to determine if children are developmentally on track in four domains:

1) Literacy-numeracy: Children are identified as being developmentally on track based on whether they can identify/name at least ten letters of the alphabet, whether they can read at least four simple, popular words, and whether they know the name and recognize the symbols of all numbers from 1 to 10. If at least two of these are true, then the child is considered developmentally on track.

2) Physical: If the child can pick up a small object with two fingers, like a stick or a rock from the ground and/or the mother/caretaker does not indicate that the child is sometimes too sick to play, then the child is regarded as being developmentally on track in the physical domain.

3) Social-emotional: Children are considered to be developmentally on track if two of the following are true: If the child gets along well with other children, if the child does not kick, bite, or hit other children and if the child does not get distracted easily.

4) Learning: If the child follows simple directions on how to do something correctly and/or when given something to do, is able to do it independently, then the child is considered to be developmentally on track in this domain.

ECDI is then calculated as the percentage of children who are developmentally on track in at least three of these four domains.”

The table shows that of children 3-4 years, 97.2% are on track physically while only 27.2% are on track in terms of literacy and numeracy tasks in 2017.

Annex Table 249 MICS: Early child development index (children 3-4 years)

	2014						2017/18					
	Children who are developmentally on track for the indicated domains (%)				Early child development index score	Total children	Children who are developmentally on track for the indicated domains (%)				Early child development index score	Total children
	Literacy-numeracy	Physical	Social-Emotional	Learning			Literacy-numeracy	Physical	Social-Emotional	Learning		
Overall	25.1	97.7	62.2	93.6	67.2	11527	27.2	97.2	51.7	93.4	59.4	15931
Gender												
Male	23.8	97.4	60.3	93.3	65.2	5809	26.5	97.2	49.3	93.2	57.5	8159
Female	26.4	98.0	64.1	94.0	69.3	5717	28.0	97.2	54.3	93.6	61.4	7771
Child's functional difficulty												
Has difficulty							21.9	92.6	46.4	82.5	47.1	949
No difficulty							27.6	97.5	52.0	94.1	60.2	14982
Wealth index quintile												
1st (poorest)	7.8	97.8	58.9	90.9	56.7	2835	11.1	96.1	45.8	92.9	46.6	3835
2nd	16.8	97.7	62.3	92.8	63.3	2314	20.9	97.1	50.3	93.6	56.0	3201
3rd	25.9	97.6	60.2	94.3	66.6	2119	27.3	97.9	53.3	92.4	60.7	3012
4th	34.9	97.8	64.5	95.1	73.4	2231	35.0	97.5	54.3	92.9	65.1	3105
5th (richest)	47.3	97.3	66.1	96.1	80.4	2027	47.9	97.9	56.8	95.2	73.2	2777
Location												
Rural	20.0	97.6	60.3	92.8	63.5	7941	22.2	97.0	50.8	92.8	55.9	10487
Urban	36.5	97.8	66.2	95.5	75.6	3585	36.9	97.7	53.4	94.6	66.1	5443
Source:	Table CD.5: Early child development index from MICS 2014 Survey Findings Report; Table TC.11.1: Early child development index from MICS 2017-2018 Survey Findings Report											

F.6.4 Learning environment in the household

The MICS collects information on support for early childhood development in the household. Support for learning in the household is measured through the occurrence of the following activities with any adult household member (15 years or above) in the last three days:

- Read books or looked at picture books with child
- Told stories to child
- Sang songs to or with child, including lullabies
- Took child outside the home
- Played with child
- Named, counted or drew things for or with child

This information is recorded for the 3-4 year age group in the 2014 survey round, and the 2-4 year age group in the 2017/18 survey round.

The table below shows that in 2014, 35.0% of children engaged in four or more activities in the past three days.

Annex Table 250 MICS: Support for learning (children 3-4 years), 2014

	Children engaged in four or more activities with adult household member (%)	Mean number of activities with adult household members	Total children
Overall	35.0	2.8	11527
Gender			
Male	34.0	2.8	5809
Female	36.0	2.8	5717
Wealth index quintile			
1st (poorest)	10.4	1.8	2835
2nd	24.5	2.4	2314
3rd	35.9	2.9	2119
4th	48.5	3.3	2231
5th (richest)	65.4	4.0	2027
Location			
Rural	27.0	2.5	7941
Urban	52.6	3.5	3585
Source:	Table CD.2: Support for learning from MICS 2014 Survey Findings Report		

Annex Table 251 MICS: Support for learning (children 2-4 years), 2017/18

	Children engaged in four or more activities with adult household member (%)	Mean number of activities with adult household members	Total children
Overall	27.9	2.3	23800
Gender			
Male	28.3	2.3	12221

Female	27.5	2.3	11580
Child's functional difficulty			
Has difficulty	21.4	2.0	1525
No difficulty	28.4	2.3	22276
Wealth index quintile			
1st (poorest)	7.3	1.2	5500
2nd	15.4	1.7	4744
3rd	26.6	2.3	4600
4th	40.2	2.9	4669
5th (richest)	56.6	3.7	4257
Location			
Rural	20.1	1.9	15594
Urban	42.9	3.0	8207
Source:	Table D TC.10.1: Support for learning from MICS 2017-2018 Survey Findings Report		

Along with activities, presence of learning materials is also measured in the household. Mothers/caretakers of all children under 5 were asked about the number of children's books or picture books they have for the child, and the types of playthings that are available at home. The table below shows that while only 2.5% of children are in households which have three or more children's books, up to 51.6% of children are in households which have two or more playthings in 2017.

Annex Table 252 MICS: Learning materials in household (children under 5 years)

	2014			2017/18		
	3 or more children's books (%)	**2 or more types of playthings (%)**	**Total children**	**3 or more children's books (%)**	**2 or more types of playthings (%)**	**Total children**
Overall	7.6	52.5	27495	2.5	51.6	39799
Gender						
Male	7.2	52.6	13915	2.3	51.5	20468
Female	7.9	52.4	13580	2.6	51.6	19331
Child's functional difficulty (children 2-4 years)						
Has difficulty				3.1	63.9	1525
No difficulty				3.7	61.2	22276
Wealth index quintile						
1st (poorest)	0.9	44.9	6316	0.3	41.8	9001
2nd	2.9	52.7	5560	0.5	53.2	7935
3rd	5.5	55.1	5335	1.5	56.0	7853
4th	10.9	55.3	5380	2.6	55.0	7814
5th (richest)	19.9	56.1	4904	8.1	53.5	7195
Location						
Rural	5.2	52.2	19002	1.3	51.0	26190
Urban	12.9	53.1	8493	4.6	52.7	13609
Source:	Table CD.3: Learning materials from MICS 2014 Survey Findings Report; Table D TC.10.2: Learning materials from MICS 2017-2018 Survey Findings Report					

F.7 Learning skills

In MICS6 (2017/18), children are tested on foundational reading and numeracy skills in the questionnaire for children 5 to 17 years. The module was introduced in this round and has not been carried out previously. This MICS indicator was designed for reporting against the SDG where children in grade 2 and 3 achieve a minimum proficiency in reading and mathematics. Children 7 to 14 years are asked to complete three reading and numeracy tasks:

Annex Table 253 MICS: Foundational skills tested in reading and numeracy

Reading tasks	Numeracy tasks
Reading story	Number reading
Comprehension: Literal question	Number discrimination
Comprehension: Inferential question	Addition
	Pattern recognition and completion

Children demonstrate foundational skills if they are able to completed all of these tasks. This section provides a selection of MICS indicators from the MICS 2017-2018 Survey Findings Report.

F.7.1 Reading

As the table below shows, in 2017 only 32.8% of children 7-14 years demonstrated foundational reading skills. The table also shows results by tasks and over various groups.

Annex Table 254 MICS: Reading skills (children 7-14 years), 2017/18

	Children who correctly read 90% of words in a story (%)	Children who correctly answered comprehension questions (%)		Children for who the demonstrate foundational reading skills (%)	Total children 7-14 years
		Three literal	Two inferential		
Overall	67.7	41.9	41.2	32.8	17471
Gender					
Male	68.4	41.4	40.3	31.9	8756
Female	67.0	42.4	42.2	33.7	8716
Child's functional difficulty					
Has difficulty	64.5	36.4	35.6	27.8	3005
No difficulty	68.3	43.0	42.4	33.8	14466
Wealth index quintile					
1st (poorest)	46.0	19.1	18.0	14.0	4169
2nd	65.8	36.1	35.3	27.8	3665
3rd	73.2	46.1	44.9	35.7	3245
4th	79.9	52.2	51.7	42.1	3282
5th (richest)	80.4	64.1	64.6	50.9	3111
Location					
Rural	62.7	36.0	35.0	27.9	11348
Urban	76.9	52.8	52.8	41.8	6123
Source:	Table D TC.4.1: Reading skills from MICS 2017-2018 Survey Findings Report				

F.7.2 Numeracy

As the table below shows, in 2017 only 4.5% of children 7-14 years demonstrated foundational numeracy skills. The table also shows results by tasks and over various groups

Annex Table 255 MICS: Numeracy skills (children 7-14 years), 2017/18

	Children who correctly complete the following tasks (%)				**Children for who the demonstrate foundational numeracy skills**	**Number of children 7-14 years**
	Number reading	Number discrimination	Addition	Pattern Recognition and completion		
Overall	58.0	55.0	12.2	6.8	4.5	17471
Gender						
Male	60.2	57.5	13.0	7.2	4.8	8756
Female	55.8	52.5	11.5	6.5	4.2	8716
Child's functional difficulty						
Has difficulty	52.3	51.0	10.1	5.4	3.5	3005
No difficulty	59.2	55.9	12.7	7.1	4.7	14466
Wealth index quintile						
1st (poorest)	33.7	33.0	7.7	4.6	2.9	4169
2nd	53.6	53.2	11.2	6.1	3.9	3665
3rd	62.1	60.2	12.8	6.8	4.4	3245
4th	68.9	65.5	14.1	6.9	4.6	3282
5th (richest)	80.2	70.1	17.0	10.7	7.4	3111
Rural/ Urban						
Rural	52.0	50.0	10.5	5.7	3.7	11348
Urban	69.2	64.4	15.5	9.0	5.9	6123
Source:	Table D TC.4.2: Numeracy skills from MICS 2017-2018 Survey Findings Report					

F.8 Parental involvement

The MICS6 (2017/18) introduces a new component on parental involvement, through activities both in the home and in school, in the questionnaire for children 5 to 17 years. This section provides a selection of MICS indicators from the MICS 2017-2018 Survey Findings Report.

F.8.1 Support for learning at home

The following table provides indicators for the learning environment at home for children 7-14 years. For instance, in 2017, while only 3.5% of children have 3 or more books at home, up to 59.6% of children read or are read books at home.

Annex Table 256 MICS: Learning environment at home (children 7-14 years), 2017/18

	Children with 3 or more books to read at home (%)	Children who read books or are read to at home (%)	Children who at home use the language used by teachers at school, among children who attend school (%)	Children who receive help with homework, among children who receive homework (%)
Overall	3.5	59.6	7.7	47.7
Gender				
Male	3.4	60.0	8.9	47.8
Female	3.7	59.3	6.4	47.6
Child's functional difficulty				
Has difficulty	3.1	59.2	9.8	48.3
No difficulty	3.6	59.7	7.3	47.6
Wealth index quintile				
1st (poorest)	0.5	39.1	13.2	21.0
2nd	1.3	57.9	6.8	38.2
3rd	2.3	62.8	4.8	49.7
4th	4.4	69.3	4.7	56.0
5th (richest)	10.4	75.7	9.6	68.4
Location				
Rural	2.2	55.4	8.2	41.3
Urban	5.9	67.4	6.9	57.9
Source:	Table LN.3.3: Learning environment at home from MICS 2017-2018 Survey Findings Report			

F.8.2 Support for learning at school

The following table provides activities in which an adult household member has participated, among children 7-14 years who are attending school. For instance, in 2017, only 27.8% of adult household members attended a school activity in the last year, if their child was attending school.

Annex Table 257 MICS: Support for school going children (7-14 years) at school, 2017/18

	Children for whom household member received a report card for the child last year (%)	Involvement by adult in school management in last year (%)			Involvement by adult in school activities in last year (%)		Total school going children age 7-14 years
		School has a governing body open to parents	Attended meeting called by governing body	A meeting discussed education/ key financial issues	Attended school celebration or a sport event	Met with teachers to child's discuss progress	
Overall	59.3	18.8	14.2	9.4	27.8	57.9	17,211
Gender							
Male	58.8	18.6	14.2	9.2	27.1	57.7	9,053
Female	59.9	18.9	14.3	9.5	28.5	58.0	8,158
Child's functional difficulty							
Has difficulty	58.2	17.8	13.1	8.6	26.2	59.0	2,898
No difficulty	59.5	19.0	14.5	9.5	28.1	57.6	14,313
School type							
Public	48.8	12.8	8.3	5.2	17.7	49.9	8,906
Non-public	78.7	28.1	23.3	15.6	44.4	72.6	6,577
Wealth index quintile							
1st (poorest)	25.9	5.0	2.5	1.4	7.1	34.1	3,077
2nd	46.0	9.4	5.5	2.9	16.6	49.1	3,544
3rd	59.7	16.0	10.9	6.9	24.7	57.2	3,443
4th	73.5	23.6	18.1	11.9	34.9	67.1	3,613
5th (richest)	86.8	37.9	32.5	22.7	52.7	78.6	3,533
Location							
Rural	50.2	13.7	9.4	5.7	21.4	51.7	10,604
Urban	73.9	26.9	22.0	15.2	38.0	67.7	6,607
Source:	Table LN.3.1: Support for child learning at school from MICS 2017-2018 Survey Findings Report						

Annex G Learning Indicators in LND Data

G.1 Indicators and disaggregation

This document presents the learning outcome indicator that has been derived from the LND dataset. Through this exercise, data is gathered on English, Urdu and Mathematics. This is a school level indicator as scores in the dataset have been are aggregated at the school level. We have raw data from September 2015 to February 2020.[64]

There are a lack of secondary variables in the LND dataset, as identified in the DQA exercise. Some of the rounds have a gender variable but it is unclear what that means as scores are aggregated at the school level.

G.2 Learning outcomes

The table below shows the average school assessment scores, both overall and by subject. These have been calculated using the following formula:

Score = (number of true answers per school / number of true answers per school + number of false answers per school) * 100

In September 2015, the average overall school score is 75.2%. The subject break-up shows English is the lowest scoring subject at 66.6%.

Annex Table 258 LND: Average school score (%) by round and subject

		English	Urdu	Math	Overall
2015	Sep.	66.6	76.9	81.3	75.2
	Oct.	70.4	80.6	85.0	79.0
	Nov.	73.1	82.9	86.9	81.3
	Dec.	76.7	85.9	89.1	84.2
2016	Jan.	76.3	86.2	88.7	84.1
	Feb.	78.1	87.7	89.6	85.5
	Mar.	No data collected			
	Apr.	72.4	81.4	84.8	79.6
	May	74.6	84.0	86.0	81.8
	June	No data collected			
	July				
	Aug.				
	Sep.	75.0	85.5	87.3	82.9
	Oct.	76.1	86.6	88.6	84.1
	Nov.	78.3	88.3	90.0	85.9

[64] The data provided from PMIU between March 2019 and February 2020 contains aggregated district level subject scores. Hence, number of observation information is not available for these rounds. In previous rounds, PMIU provided raw data at the school level.

	Dec.	72.9	79.8	83.3	79.0
2017	**Jan.**	74.2	82.0	85.2	81.0
	Feb.	76.4	84.3	87.5	83.3
	Mar.	78.1	85.6	88.9	84.8
	Apr.	75.9	76.9	80.5	78.1
	May	74.1	75.5	78.2	76.2
	June	No data collected			
	July				
	Aug.	72.1	76.6	78.6	76.1
	Sep.	72.5	78.4	81.3	77.9
	Oct.	74.7	82.7	80.8	79.9
	Nov.	79.5	87.0	87.0	85.3
	Dec.	81.6	88.7	89.5	87.5
2018	**Jan.**	82.9	89.7	90.6	88.6
	Feb.	84.5	90.9	91.7	89.8
	Mar.	78.1	83.1	81.9	81.3
	Apr.	79.9	84.9	84.7	83.6
	May	82.2	87.2	87.7	86.2
	June	No data collected			
	July				
	Aug.				
	Sep.	80.6	86.7	87.3	85.6
	Oct.	No data collected			
	Nov.	83.8	89.6	91.0	88.9
	Dec.	85.0	90.6	92.0	90.0
2019	**Jan.**	85.1	90.8	92.0	90.1
	Feb.	85.3	91.1	92.4	90.4
	Mar.	85.0	91.9	91.1	89.3
	Apr.	77.5	81.2	82.1	80.3
	May	78.5	83.3	83.5	81.8
	June	No data collected			
	July				
	Aug.				
	Sep.	69.5	72.0	73.8	71.8
	Oct.	68.7	81.4	77.8	75.9
	Nov.	75.1	87.0	81.0	81.0
	Dec.	73.4	82.3	81.2	79.0
2020	**Jan.**	71.5	80.9	85.9	79.4
	Feb.	70.7	80.9	84.7	78.8

The table below shows the number of observations (i.e. number of schools covered) by each round. Under some observations there is no data under one or more of the subjects (especially in January

2017). It is unclear how an assessment could be completed without completing one of the subjects. There is no number of observation information from March 2019 onwards.

Annex Table 259 LND: Number of observations in each round

		English	Urdu	Math	Overall
2015	Sep.	42338	42340	42340	42340
	Oct.	36401	36402	36402	36402
	Nov.	45694	45695	45694	45695
	Dec.	41611	41611	41611	41611
2016	Jan.	42607	42607	42607	42607
	Feb.	42849	42849	42849	42849
	Mar.				
	Apr.	48599	48706	48663	48728
	May	41489	41559	41530	41567
	Jun.				
	Jul.				
	Aug.				
	Sep.	44309	44387	44360	44399
	Oct.	46715	46796	46781	46810
	Nov.	46990	47051	47021	47058
	Dec.	24962	24981	24995	25006
2017	Jan.	47634	47637	47674	47674
	Feb.	37765	37747	37830	37830
	Mar.	36253	36255	36326	36326
	Apr.	47243	47230	47314	47314
	May	45083	45097	45159	45159
	June				
	July				
	Aug.	28381	28370	28419	28419
	Sept	45301	45303	45362	45362
	Oct.	44512	44532	44636	44636
	Nov.	41303	41299	41410	41410
	Dec.	39626	39607	39718	39718
2018	Jan.	43308	43308	43417	43417
	Feb.	26810	26825	26880	26880
	Mar.	44636	44645	44745	44745
	Apr.	45574	45586	45672	45672
	May	31479	31480	31551	31551
	June				
	July				
	Aug.				
	Sep.	44994	44979	45078	45078
	Oct.				

	Nov.	45196	45196	45304	45304
	Dec.	40794	40790	40872	40872
2019	**Jan.**	42589	42576	42681	42681
	Feb.	30710	30717	30774	30774

Annex H Learning Indicators in DFID Six Monthly Assessment

H.1 Indicators and disaggregation

This document presents the learning outcome indicator that has been derived from the DFID 6MA data set. Through this exercise, data is gathered on English, Urdu and Mathematics. This scores have been calculated at the student level. We have raw data collected bi-annually from September 2014 to March 2018.

H.1.1 Levels of disaggregation

As identified in the DQA exercise, a number of variables are available to better understand the variation in education indicators. The following variables have been selected for this analysis:

H.1.1.1 Demographic variable

Student gender is available from March 2017 onwards.

H.1.1.2 School type

There are several school level variables in this dataset. Since the assessment is conducted in both government and PEF schools, the data can be disaggregated by school type. Information is available on school level from high,[65] middle, primary and mosque. School level information is available for government schools only.[66] School gender information (male or female) is also collected. However, school gender information is missing in most of the rounds (i.e. it is not recorded for each observation).

H.1.1.3 Geographical variables

In terms of geography, data can be segregated by the district level. An urban/rural variable is only available in one round – September 2016.

H.2 Learning outcomes

The tables below show the average student assessment scores both by subject and over various disaggregations. These have been calculated using the following formula:

Score = (number of true answers per student / number of true answers per student + number of false answers per student) * 100

In September 2014, the overall score is 59.2%. The remainder of the table provides scores by category – students in girls' schools score 64.3% in comparison to those in boys' schools who score 54.2%.

[65] The high category includes both high and high secondary schools.
[66] In March 2015 and March 2017, school level is also available for 35 PEF schools.

Annex Table 260 DFID 6MA: Overall average student score (%)

	Sept. '14	Mar. '15	Sept. '15	March '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Overall	59.2	70.2	65.3	70.6	65.6	74.9	66.3	78.4
School type								
Government	59.2	57.2	57.4	63.7	60.2	67.6	62.0	77.1
PEF		84.1	73.4	77.9	72.6	82.3	70.4	79.7
School level								
Primary	57.7	53.0	56.5	62.6	60.3	65.4	61.9	79.0
Middle	58.2	59.8	56.1	65.4	57.5	68.9	63.5	77.2
High	64.3	61.0	59.7	63.7	62.3	69.3	61.0	74.8
Mosque	37.0	54.6	67.3	64.7		53.8		
School gender								
Female	64.3	62.5	57.9	65.9	61.2	71.0	64.7	78.1
Male	54.2	52.4	56.8	61.6	59.1	63.7	58.5	75.6
Location								
Rural					59.2			
Urban					63.2			
Student gender								
Female						77.0	68.4	79.7
Male						72.9	64.3	77.1

Annex Table 261 DFID 6MA: English average student score (%)

	Sept. '14	Mar. '15	Sept. '15	March '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Overall	61.5	65.5	64.7	63.8	61.6	70.2	61.7	71.0
School type								
Government	61.5	53.9	58.7	58.6	57.4	63.0	58.0	70.0
PEF		77.9	70.8	69.4	67.2	77.4	65.2	72.0
School level								
Primary	59.6	50.5	56.8	57.5	57.2	60.3	57.1	72.7
Middle	60.7	56.2	59.3	62.1	55.4	64.5	59.7	69.6
High	66.8	56.9	60.8	57.0	59.2	65.0	57.6	67.1
Mosque	42.3	54.9	68.8	58.3		55.1		
School gender								
Female	66.6	59.8	61.0	61.7	58.5	67.0	61.0	71.6
Male	56.4	48.6	56.4	55.6	56.1	58.4	54.3	67.8
Location								
Rural					56.9			
Urban					58.6			
Student gender								
Female						73.1	64.4	73.2
Male						67.3	59.0	68.7

Annex Table 262 DFID 6MA: Urdu average student score (%)

	Sept. '14	Mar. '15	Sept. '15	March '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Overall	50.1	69.8	64.3	69.3	66.7	75.6	68.8	78.7
School type								
Government	50.1	53.8	52.8	59.8	59.2	67.3	61.4	75.3
PEF		87.0	76.1	79.5	76.4	84.1	75.9	82.0
School level								
Primary	49.3	49.4	53.0	58.5	59.2	64.1	60.9	76.8
Middle	48.6	56.3	50.3	62.0	55.7	69.0	63.2	75.5
High	54.3	58.3	54.7	59.6	62.1	69.5	60.5	73.3
Mosque	27.0	45.2	60.7	62.0		56.2		
School gender								
Female	57.2	61.7	54.6	64.2	63.4	73.0	66.5	77.9
Male	43.0	46.5	50.9	55.4	54.9	60.3	55.0	71.6
Location								
Rural					57.4			
Urban					64.4			
Student gender								
Female						79.9	74.1	81.9
Male						71.4	63.7	75.4

Annex Table 263 DFID 6MA: Math average student score (%)

	Sept. '14	Mar. '15	Sept. '15	March '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Overall	65.3	74.2	66.6	76.9	67.8	78.0	67.3	84.0
School type								
Government	65.3	63.1	60.3	71.2	63.3	71.6	64.5	84.3
PEF		86.2	73.1	83.1	73.5	84.6	70.1	83.8
School level								
Primary	63.5	58.5	59.3	70.4	63.6	70.6	65.3	85.8
Middle	64.5	66.0	58.7	71.1	60.8	72.3	65.6	84.7
High	71.0	67.0	63.1	72.5	65.0	72.5	62.9	82.1
Mosque	40.7	63.4	72.0	72.0		50.7		
School gender								
Female	68.3	65.3	58.4	70.6	61.5	72.4	65.0	83.5
Male	62.3	61.1	62.3	71.9	65.2	70.9	63.8	85.3
Location								
Rural					62.5			
Urban					65.7			
Student gender								
Female						77.5	66.2	83.0
Male						78.6	68.4	85.2

Annex Table 264 DFID 6MA: Number of observations

	Sept. '14	Mar. '15	Sept. '15	March '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Overall	5517	10944	11513	11617	9167	11563	11189	11416
School type								
Government	5517	5672	5821	6005	5184	5825	5473	5635
PEF		5272	5692	5612	3983	5738	5716	5781
School level								
Primary	2531	2274	2544	2508	2117	2006	1972	2202
Middle	1415	1688	1619	1668	1385	1785	1413	1555
High	1472	1683	1588	1805	1682	2046	2088	1878
Mosque	99	62	70	24		23		
School gender								
Female	2748	2692	2960	2999	2647	3181	3034	3285
Male	2769	2980	2861	3006	2537	2615	2439	2350
Location								
Rural					3850			
Urban					1334			
Student gender								
Female						5763	5469	5798
Male						5800	5720	5617

H.2.1 Significance of school level variables

The table below shows the difference in mean scores over various groups – school type, school level, school gender, rural/urban and student gender. Stars have been used to indicate if the difference within groups is statistically significant.

Annex Table 265 DFID 6MA: Average student score significance

	Sept. 2014	Mar. 2015	Sept. 2015	Mar. 2016	Sept. 2016	Mar. 2017	Sept. 2017	Mar. 2018
School type								
diff. (Government) – (PEF)								
English		-24.0***	-12.1***	-10.7***	-9.8***	-14.4***	-7.2***	-2.0***
Urdu		-33.3***	-23.3***	-19.7***	-17.1***	-16.8***	-14.5***	-6.8***
Math		-23.1***	-12.8***	-11.8***	-10.2***	-13.0***	-5.6***	0.5
Overall		-26.9***	-16.0***	-14.0***	-12.4***	-14.6***	-9.0***	-2.6***
School level								
diff. (High) - (Primary)								
English	7.2***	6.4***	3.9***	-0.5	2.1**	4.7***	0.5	-5.6***
Urdu	5.0***	8.9***	1.7	1.2	2.9**	5.4***	-0.3	-3.5***
Math	7.5***	8.5***	3.8***	2.2**	1.4	1.9**	-2.4**	-3.7***
Overall	6.6***	8.0***	3.1***	1	2.1**	3.9***	-0.9	-4.2***
diff. (Middle) - (Primary)								
English	1.1	5.7***	2.5***	4.6***	-1.8*	4.2***	2.5***	-3.1***
Urdu	-0.7	6.9***	-2.7**	3.5***	-3.6***	5.0***	2.4*	-1.3
Math	1	7.5***	-0.7	0.8	-2.8***	1.7*	0.4	-1.2*
Overall	0.5	6.8***	-0.4	2.8***	-2.8***	3.5***	1.7*	-1.8**
diff. (High) - (Middle)								
English	6.2***	0.7	1.5	-5.1***	3.9***	0.5	-2.0**	-2.6***
Urdu	5.7***	2	4.4***	-2.4*	6.4***	0.4	-2.7**	-2.2*
Math	6.5***	1	4.4***	1.4	4.2***	0.2	-2.8***	-2.6***
Overall	6.1***	1.3	3.5***	-1.8*	4.8***	0.3	-2.5***	-2.4***
diff. (Primary) - (Mosque)								
English	17.3***	-4.4	-11.9***	-0.8		5.2		
Urdu	22.3***	4.2	-7.7	-3.6		7.9		
Math	22.8***	-4.9	-12.6***	-1.7		19.9***		

Overall	20.7***	-1.5	-10.8***	-2		11.5*		
diff. (Middle) - (Mosque)								
English	18.3***	1.3	-9.4***	3.8		9.4*		
Urdu	21.6***	11.2**	-10.4**	0		12.8*		
Math	23.8***	2.6	-13.3***	-0.9		21.6***		
Overall	21.2***	5.2	-11.2***	0.8		15.0***		
diff. (High) - (Mosque)								
English	24.5***	2	-8.0**	-1.3		9.9*		
Urdu	27.3***	13.1**	-6	-2.4		13.3*		
Math	30.3***	3.6	-8.9**	0.5		21.8***		
Overall	27.4***	6.5*	-7.7**	-0.9		15.4***		
School gender								
diff. (Female) – (Male)								
English	10.2***	11.2***	4.6***	6.2***	2.4***	8.5***	6.7***	3.8***
Urdu	14.2***	15.2***	3.7***	8.8***	8.5***	12.7***	11.6***	6.3***
Math	6.0***	4.2***	-3.9***	-1.3*	-3.8***	1.5**	1.1	-1.8***
Overall	10.1***	10.0***	1.1	4.2***	2.1***	7.3***	6.2***	2.5***
Location								
diff. (Rural) - (Urban)								
English					-1.6*			
Urdu					-7.0***			
Math					-3.3***			
Overall					-4.0***			
Student gender								
diff. (Female) – (Male)								
English						5.9***	5.4***	4.5***
Urdu						8.6***	10.4***	6.5***
Math						-1.0**	-2.2***	-2.2***
Overall						4.2***	4.2***	2.6***

*p<0.05, **p<0.01, ***p<0.001

H.3 Learning outcomes: Student learning objectives (SLO)

The DFID 6MA dataset records assessment scores by the student learning objectives (SLOs) that are tested under each subject. The tables below show the average score (percentage of right answers) by SLOs under each subject. For instance in September 2014, students do not do well in English comprehension as the average score on those questions is 23.1% in comparison to the English alphabet when the score is 91.4%.

Annex Table 266 DFID 6MA: Student learning objectives score in English

	Sept. '14	Mar. '15	Sept. '15	Mar. '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Alphabet	91.4	92.7	92.1	93.9	94.3	96.0	95.9	96.4
Spelling	73.0	86.1	73.6	73.0	66.9	78.7	75.1	76.0
Picture Word	54.1	63.6	73.5	59.8	52.7	64.5	62.4	81.7
Sentence Completion	45.9	50.0	52.1	54.4	57.6	59.2	48.1	59.6
Comprehension	23.1	41.6	35.8	37.4	29.8	54.8	29.0	44.3

Annex Table 267 DFID 6MA: Student learning objectives score in Urdu

	Sept. '14	Mar. '15	Sept. '15	Mar. '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Jor kay tor	61.4		68.6	83.0	77.8	86.3	86.9	88.4
Tor kay jor	36.5	66.3	60.2	71.2	76.1	76.5	70.0	70.3
Picture Recognition	49.8	73.0	69.3	67.8	69.4	77.9	70.0	87.7
Sentences	52.5	80.0	76.7	81.3	71.0	85.1	71.3	84.4
Comprehension	50.1	68.4	60.1	59.7	58.7	72.7	64.1	78.0
Muzakkar Monus		66.9	56.5	56.4	55.1	60.3	59.3	70.1
Wahid Jama		67.6	59.0	66.0	58.6	70.5	59.8	72.0

Annex Table 268 DFID 6MA: Student learning objectives score in Math

	Sept. '14	Mar. '15	Sept. '15	Mar. '16	Sept. '16	Mar. '17	Sept. '17	Mar. '18
Missing Numbers	91.9	84.8	87.9	90.7	88.7	90.0	85.0	93.3
Addition	57.6	80.8	74.8	84.4	74.9	86.4	75.5	89.1
Fractions	63.6	84.1	66.4	85.3	68.7	74.3	64.0	92.8
Subtractions	40.9	67.2	59.4	70.0	58.2	73.9	60.7	75.5
Multiplication	63.8	86.9	77.7	85.6	80.9	86.7	75.2	90.7
Time		58.1	54.8	74.3	59.3	67.7	53.8	77.6
Division		64.1	52.7	63.7	57.0	78.3	68.0	81.7
Word Problem			45.4	46.7	37.1	55.6	41.9	60.5
Identifying Shapes		68.4						

Annex I Education Indicators in the ASC/EMIS

I.1 Indicators and disaggregation

This Annex presents education indicators that have been derived from the ASC/EMIS dataset for the Punjab province. The ASC/EMIS survey gathers detailed information at the school level, the below indicators have been developed.

Annex Table 269 EMIS: List of indicators

Student level	School level
Participation	School environment [facilities & infrastructure]
Enrolment	Management and governance
	Teacher effectiveness

Extensive raw data is available on government schools from 2012 to 2018, along with limited raw data from 2019 and 2020. More specifically, the 2019 data made available does not include management and governance indicators. Moreover, the 2020 data presents provisional information on selected indicators. There are issues of comparability with the 2020 round because it only includes schools under the School Education Department (SED) (schools under public private partnerships such as Punjab Education Initiatives Management Authority (PEIMA)[67] are not in the 2020 raw data made available).

The student level indicators mentioned above, particularly participation and enrolment, need to be supplemented by population data. Since the Pakistan census data is not publicly available, we relied on the population estimates of the United Nations, Department of Economic and Social Affairs, Population Division. This data was downloaded from their website[68].

These population estimates are disaggregated by gender and age. In terms of age the following categories are available: 0-4 years, 5-9 years, 10-14 years, 15-19 years. Since these age brackets do not completely coincide with the AEPAM reporting of enrolment numbers, EMIS statistics will not be directly comparable. The following table shows the age to class cut-offs that will be used.

Annex Table 270 EMIS: Age groups and class levels

Age group	Class level
0-4 years	Pre-Primary: Class Katchi/ECE
5-9 years	Primary: Classes 1-5
10-14 years	Middle: Classes 6-8

However, this population is only available for Pakistan as a whole. The Labour Force Survey (LFS) data, available on the Pakistan Bureau of Statistics website, was used to gauge the portion of the population that is in Punjab. These estimates are available from 2012/13, 2013/14, 2014/15 and 2017/18 LFS rounds, and have been matched with the relevant EMIS years.

[67] There were 4,270 schools under PEIMA according to EMIS 2019.
[68] This dataset was downloaded on April 2020 from https://esa.un.org/unpd/wpp/DataQuery/.

I.1.1 Levels of disaggregation

As identified in the DQA exercise, the following variables have been selected to better understand the variation in education indicators:

I.1.1.1 School type

The ASC/EMIS survey provides information on type of school. The categories used for this analysis are school level which includes high secondary, high, middle, primary and mosque schools. A variable that accounts for the official gender, girls or boys, of the school is also included.

I.1.1.2 Geographical variables

To understand spatial variation, an urban/rural categorical variable is included in this analysis.

I.1.1.3 Functional schools

The ASC/EMIS records information on the school status which includes the following categories: functional, non-functional, consolidated, shifted, newly established. The analysis has been carried out on functional schools only, which make up a majority of the population.

Annex Table 271 EMIS: Status of schools

	2012	2013	2014	2015	2016	2017	2018	2019	2020 (P)
Functional	53560 (92.1%)	52614 (95.9%)	52371 (98.3%)	52177 (98.4%)	52231 (98.7%)	52394 (99.9%)	52390 (100%)	52477 (100%)	
Non Functional						31 (0.1%)	9 (0.0%)		
Closed	337 (0.6%)	318 (0.6%)	247 (0.5%)	107 (0.2%)	93 (0.2%)	0 (0.0%)			
Merged	179 (0.3%)	342 (0.6%)	227 (0.4%)	112 (0.2%)	176 (0.3%)	14 (0.0%)			
Denotified/ Transferred	16 (0.0%)	6 (0.0%)	34 (0.1%)	16 (0.0%)	38 (0.1%)	2 (0.0%)			
Consolidated	3975 (6.8%)	1537 (2.8%)	416 (0.8%)	614 (1.2%)	403 (0.8%)	2 (0.0%)			
Newly Established	107 (0.2%)	40 (0.1%)	1 (0.0%)	13 (0.0%)					
Shifted		11 (0.0%)		10 (0.0%)					
Total	58174 (100%)	54868 (100%)	53296 (100%)	53049 (100%)	52941 (100%)	52443 (100%)	52399 (100%)	52477 (100%)	48217 (100%)

I.2 Participation rate

The participation rate measures how many children are currently enrolled in government schools, in comparison to the remaining population. This variable has been calculated from the number of students by age variable combined with the UN population data. The formula used to calculate it is shown below:

PR = [number of children ages 5-14 years in public school / total number of children ages 5-14 years in the population]

Since the denominator of this formula is extracted from population estimates, the participation rate is not available in various disaggregations. Participation rate is not available by gender because the EMIS gathers student numbers by gender or age, but not gender and age simultaneously. Furthermore, the raw data from 2016 onwards does not contain student enrolment by age. This means that participation and net enrolment is only available from 2012 to 2015.

The table below provides participation rates between 2012 and 2015.

Annex Table 272 EMIS: Participation (number of students)

	2012	2013	2014	2015
Overall (5-14 years)	9,364,921	9,778,555	9,739,689	9,646,409
Age Group				
5-9 years	6,035,190	6,298,249	6,281,537	6,198,826
10-14 years	3,329,731	3,480,306	3,458,152	3,447,583

Annex Table 273 EMIS: Participation rates (%)

	2012	2013	2014	2015
Overall (5-14 years)	37.9	39.3	38.9	38.2
Age Group				
5-9 years	47.6	49.3	48.8	47.6
10-14 years	27.6	28.8	28.5	28.2

I.3 Enrolment

The enrolment indicators have been calculated as per the formulas identified in the DQA document. This indicator has been calculated from the same variable used to calculate the participation rate – namely the number of students enrolled by age and gender.

I.3.1 Gross enrolment ratio (GER)

This calculates participation in schooling by educational level. The formula for primary GER is:

GER = [number of children in primary school] / [total population of children at primary age]

GER is all the people that are enrolled at a certain level of education over the number of people that correspond to that level of education. The tables below show overall and gender wise GER by the pre-primary, primary and middle level. For instance, in 2012 the overall *katchi* GER for government schools is 14.9%. Gender breakdown is not available for pre-primary GER in 2019 and GERs in 2020.

Annex Table 274 EMIS: Pre-primary (*katchi*) GER (%)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Overall	14.9	16.5	15.3	14.7	15.4	17.1	15.7	11.6	7.0
Gender									
Female	14.8	16.5	15.5	14.9	15.4	17.0	15.6		
Male	15.0	16.5	15.2	14.5	15.4	17.2	15.9		

Annex Table 275 EMIS: Primary (class 1-5) GER (%)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Overall	39.1	39.7	39.9	39.6	41.2	45.3	47.3	46.7	42.0
Gender									
Female	38.6	39.2	39.6	39.7	41.6	46.2	48.4	48.0	
Male	39.7	40.2	40.1	39.4	40.9	44.6	46.2	45.4	

Annex Table 276 EMIS: Middle (class 6-8) GER (%)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Overall	17.6	18.2	18.1	17.7	17.5	18.4	19.4	19.9	19.8
Gender									
Female	16.2	17.0	17.1	17.0	17.2	18.6	19.8	20.5	
Male	18.9	19.2	19.0	18.3	17.9	18.3	19.0	19.3	

I.3.2 Net enrolment ratio (NER)

This calculates participation in schooling by both age and educational level. The formula for primary NER: NER is not available for 2016 onwards as the raw data is not available by age.

NER = [number of children at primary age in primary school] / [total population of children at primary age]

The tables below show overall and gender wise NER by the pre-primary, primary and middle level. For instance, in 2012 the overall *katchi* NER for government schools is 4.4%.

Annex Table 277 EMIS: NER (%)

	2012	2013	2014	2015
Pre-primary level (Katchi & 0-4 years)	4.4	5.3	5.2	5.1
Primary level (Class 1-5 & 5-9 years)	28.1	28.6	28.6	28.0
Middle level (Class 6-8 & 10-14 years)	15.8	16.7	16.2	15.4

Note on functional schools: As noted in the introduction of this document, the analysis has been carried out functional schools only. That being said there are students enrolled in non-functional and closed schools. However, these students are not included in the analysis.

I.4 School Environment

The ASC/EMIS exercise gathers detailed information on the availability of facilities and the physical infrastructure of the school building. The table below shows the specific variables that have been selected for analysis under these two broad categories.

Annex Table 278 EMIS: Facilities and infrastructure selected indicators

Facilities	Infrastructure
Electricity	Condition of school building
Drinking water	Boundary wall
Toilets	Student-classroom ratio

I.4.1 Facilities

In the EMIS there is a checklist of facilities and the enumerator has to record whether each facility is a) available, b) not available or c) available but not working. The below analysis shows the availability of electricity, drinking water and latrines. The following formula is used:

% availability = [facility is available / facility is available + facility is not available + facility is available but not working]*100

Note: Option c) 'available but not working' makes up under 1% of the responses.

I.4.1.1 Electricity

The table below provides overall percentages of electricity availability and by school level, gender and location. For instance in 2012, 77.8% of schools have electricity.

Annex Table 279 EMIS: Availability of electricity

	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Overall	41641	77.8	42676	81.4	45302	86.5	48516	93	48727	93.4	50757	96.9	51239	100	51808	98.7	47825	99.2
School level																		
H.Sec.	630	99.4	655	99.5	665	99.4	672	99.9	679	99.9	718	99.9	747	100	759	99.9	769	99.9
High	5806	98.1	5944	98.7	6051	98.9	6208	99.3	6371	99.5	6649	99.8	6645	100	6738	99.7	7985	99.8
Middle	7443	92.8	7688	94.1	7945	95.5	8214	97.8	8175	97.9	8197	99	8243	100	8301	99.7	7141	99.7
Primary	27224	72.3	27882	76.7	30175	83.1	32924	91.3	33022	91.7	34725	96.2	35272	100	35831	98.4	31771	99

Mosque	538	39.7	507	42.3	466	50	498	63	480	65.6	468	72.9	332	100	179	79.6	159	82.8
School gender																		
Female	21136	79.3	22106	83.6	23796	89.1	25684	95.1	25653	95.4	26314	97.8	27101	100	27339	99.2	25363	99.5
Male	20505	76.2	20569	79.2	21506	83.9	22832	90.7	23074	91.3	24443	95.9	24138	100	24469	98.2	22462	98.9
School location																		
Urban	5376	93.1	5380	94.8	5585	96.3	6016	98	6085	97.9	5758	99.4	5970	100	5979	99.7	5657	99.7
Rural	36265	75.9	37296	79.8	39717	85.3	42500	92.3	42642	92.8	44991	96.6	45269	100	45829	98.6	42168	99.1

The table below shows the difference in electricity availability within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 280 EMIS: Availability of electricity, group-wise significance

Electricity	2012	2013	2014	2015	2016	2017	2018	2019	2020
School level									
diff. (Higher Secondary)-(High)	0.014*	0.009	0.005	0.006	0.003	0.001	0.000	0.001	0.001
diff. (Higher Secondary)-(Middle)	0.067***	0.055***	0.039***	0.021***	0.020***	0.009*	0.000	0.002	0.002
diff. (Higher Secondary)-(Primary)	0.273***	0.229***	0.163***	0.085***	0.082***	0.037***	0.000	0.015**	0.009*
diff. (Higher Secondary)-(Mosque)	0.599***	0.572***	0.494***	0.369***	0.343***	0.270***	0.000	0.203***	0.171***
diff. (High)-(Middle)	0.053***	0.046***	0.033***	0.015***	0.017***	0.008***	0.000	0.000	0.001
diff. (High)-(Primary)	0.259***	0.220***	0.157***	0.079***	0.079***	0.036***	0.000	0.013***	0.008***
diff. (High)-(Mosque)	0.585***	0.563***	0.489***	0.363***	0.340***	0.269***	0.000	0.202***	0.170***
diff. (Middle)-(Primary)	0.207***	0.174***	0.124***	0.064***	0.062***	0.028***	0.000	0.013***	0.006***
diff. (Middle)-(Mosque)	0.532***	0.518***	0.455***	0.348***	0.323***	0.261***	0.000	0.201***	0.169***
diff. (Primary)-(Mosque)	0.326***	0.343***	0.331***	0.284***	0.261***	0.233***	0.000	0.189***	0.162***
School gender									
diff. (Female)-(Male)	0.031***	0.044***	0.052***	0.044***	0.041***	0.019***	0.000	0.009***	0.006***
School location									
diff. (Rural)-(Urban)	-0.170***	-0.150***	-0.110***	-0.056***	-0.052***	-0.028***	-0.000	-0.010***	-0.006***

*p<0.05, **p<0.01, ***p<0.001

I.4.1.2 Drinking water

The table below provides overall percentages of drinking water availability and by school level, gender and location. For instance in 2012, 97.5% of schools have drinking water.

Annex Table 281 EMIS: Availability of drinking water

	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	#	%	#	%	#	%	#	#	%	#	%	%	#	%	#	%	#	%
Overall	52195	97.5	50793	96.6	51400	98.2	51878	99.5	51982	99.5	52191	99.6	52119	100	52347	99.8	48097	99.8
School level																		
H.Sec.	633	99.8	651	98.9	668	99.9	672	99.9	677	99.6	719	100	747	100	759	99.9	767	99.6
High	5869	99.2	6009	99.5	6078	99.3	6231	99.7	6395	99.9	6660	100	6649	100	6751	99.9	7994	99.9
Middle	7952	99.2	8085	98.7	8258	99.3	8378	99.7	8349	99.9	8271	99.9	8256	100	8321	99.9	7159	99.9
Primary	36522	97.1	35000	95.9	35535	97.9	35825	99.4	35841	99.4	35913	99.5	36047	100	36296	99.7	31989	99.7
Mosque	1219	90	1048	87.4	861	92.4	772	97.6	720	98.4	628	97.8	420	100	220	97.8	188	97.9
School gender																		
Female	25983	97.5	25697	96.9	26286	98.4	26871	99.5	26799	99.6	26833	99.7	27373	100	27508	99.8	25434	99.8
Male	26212	97.4	25095	96.3	25114	97.9	25007	99.4	25183	99.5	25358	99.5	24746	100	24839	99.7	22663	99.7
School location																		
Urban	5682	98.4	5601	98.4	5740	99	6103	99.5	6198	99.8	5787	99.9	5983	100	5987	99.8	5662	99.8
Rural	46513	97.3	45192	96.4	45660	98.1	45775	99.5	45784	99.5	46396	99.6	46136	100	46360	99.7	42435	99.7

The table below shows the difference in drinking water availability within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 282 EMIS: Availability of drinking water, group-wise significance

Drinking Water	2012	2013	2014	2015	2016	2017	2018	2019	2020
School level									
diff. (Higher Secondary)-(High)	0.007	-0.006	0.006	0.002	-0.003*	0.000	0.000	-0.000	-0.003*
diff. (Higher Secondary)-(Middle)	0.007	0.003	0.006	0.001	-0.003*	0.001	0.000	-0.001	-0.003*
diff. (Higher Secondary)-(Primary)	0.028***	0.030***	0.020***	0.004	0.001	0.005	0.000	0.002	-0.001
diff. (Higher Secondary)-(Mosque)	0.098***	0.115***	0.075***	0.023***	0.012*	0.022***	0.000	0.021***	0.017*
diff. (High)-(Middle)	0.000	0.009***	0.000	0.001	0.000	0.001	0.000	0.000	0.000
diff. (High)-(Primary)	0.021***	0.036***	0.014***	0.002*	0.005***	0.005***	0.000	0.002**	0.002**
diff. (High)-(Mosque)	0.091***	0.121***	0.069***	0.021***	0.015***	0.021***	0.000	0.021***	0.020***
diff. (Middle)-(Primary)	0.021***	0.027***	0.014***	0.003***	0.005***	0.004***	0.000	0.002***	0.002***
diff. (Middle)-(Mosque)	0.091***	0.113***	0.069***	0.021***	0.015***	0.021***	0.000	0.022***	0.020***
diff. (Primary)-(Mosque)	0.070***	0.085***	0.055***	0.018***	0.011***	0.017***	0.000	0.019***	0.018***

School gender									
diff. (Female)-(Male)	0.001	0.006***	0.004***	0.001	0.000	0.002***	0.000	0.000	0.000
School location									
diff. (Rural)-(Urban)	-0.011***	-0.020***	-0.009***	-0.001	-0.002**	-0.028***	0.000	-0.000	-0.000

*p<0.05, **p<0.01, ***p<0.001

I.4.1.3 Toilets

The table below provides overall percentages of latrine availability and by school level, gender and location. For instance in 2012, 94.9% of schools have latrines.

Annex Table 283 EMIS: Availability of toilets

	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	Obs.	%	Obs.	%
Overall	50835	94.9	51322	97.6	51468	98.3	51770	99.2	51837	99.3	52205	99.6	52222	100	52222	99.5	48102	99.8
School level																		
H.Sec.	628	99.1	657	99.8	669	100	673	100	679	100	719	100	749	100	760	100	770	100
High	5874	99.3	6010	99.5	6105	99.7	6251	100	6394	99.9	6663	100	6665	100	6754	100	8000	100
Middle	7935	98.9	8155	99.5	8282	99.6	8386	99.8	8337	99.8	8275	100	8272	100	8324	100	7161	99.9
Primary	35532	94.4	35649	97.7	35683	98.3	35753	99.2	35756	99.2	35941	99.6	36141	100	36179	99.4	31999	99.7
Mosque	866	64	851	71.1	729	78.2	707	89.4	671	91.7	607	94.5	395	100	205	91.1	172	89.6
School gender																		
Female	25967	97.5	26216	98.8	26468	99.1	26874	99.5	26783	99.5	26845	99.8	27457	100	27469	99.6	25469	99.9
Male	24868	92.4	25105	96.3	25000	97.5	24896	98.9	25054	99	25360	99.5	24765	100	24753	99.4	22633	99.6
School location																		
Urban	5664	98.1	5648	99.2	5755	99.3	6118	99.6	6187	99.7	5783	99.8	6000	100	5983	99.7	5671	99.9
Rural	45171	94.5	45674	97.4	45713	98.2	45652	99.2	45650	99.2	46414	99.6	46222	100	46239	99.5	42431	99.7

The EMIS survey also records the number of toilets, those that are useable, those that need repair and those that designated for teachers, per school. An indicator on useable toilets has been calculated through the following formula:

% usable = [number of usable toilets / number of total toilets]*100

The table below shows the average of these values. For instance, in 2012, 96.8% of toilets in schools are useable.

Annex Table 284 EMIS: Average useable toilets (as a % of total toilets)

	2012	2013	2014	2015	2016	2017	2018	2019
Overall	96.8	95.9	96.6	96.6	97.0	95.5	96.9	98.8
School level								
H.Sec.	92.0	93.1	94.5	94.7	96.3	96.2	96.2	98.0
High	95.3	94.3	95.3	95.7	96.9	95.8	96.9	98.8
Middle	96.9	96.3	96.8	97.1	97.6	96.4	98.0	99.4
Primary	97.1	96.2	96.8	96.7	96.9	95.3	96.8	98.7
Mosque	96.1	95.0	95.2	95.2	93.6	91.5	92.5	98.3
School gender								
Female	96.1	95.4	96.2	96.2	96.6	95.1	97.0	98.7
Male	97.4	96.5	97.0	97.0	97.5	95.9	96.9	98.9
School location								
Urban	97.5	95.5	97.1	96.3	97.5	95.8	97.2	98.9
Rural	96.7	96.0	96.5	96.6	96.9	95.5	96.9	98.8

Additionally, the student-toilet ratio, or the number of children per useable toilet, has been calculated through the below formula:

Student-toilet ratio = [total number of students/total number of useable toilets]

The average student-toilet ratio values are shown in the table below. For instance in 2012, there are around 67 students to one useable toilet on average.

Annex Table 285 EMIS: Average student-useable toilet ratio

		2012	2013	2014	2015	2016	2017	2018	2019
Overall		67.2	66.2	62.1	58.5	59.1	62.9	53.0	45.1
	School level								
H.Sec.		114.8	106.9	98.5	94.9	95.6	99.0	85.9	73.6
High		113.1	107.7	102.1	93.1	88.9	89.4	75.5	64.7
Middle		84.9	85.2	79.7	72.7	71.2	73.4	58.7	50.3
Primary		55.4	54.5	50.8	48.7	50.5	55.0	46.9	39.6
Mosque		38.6	40.0	38.2	38.8	40.0	46.7	42.6	33.1

	School gender								
Female		60.4	60.4	57.4	55.2	56.5	61.5	52.5	44.5
Male		74.3	72.2	67.0	62.2	61.9	64.3	53.5	45.6
	School location								
Urban		93.4	91.2	86.2	79.4	78.7	83.8	70.2	58.5
Rural		64.0	63.1	59.1	55.7	56.4	60.3	50.7	43.3

The tables below show the difference in toilet availability, useable toilets and student-useable toilet ratios within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 286 EMIS: Availability of toilets, group-wise significance

Toilets	2012	2013	2014	2015	2016	2017	2018	2019	2020
School level									
diff. (Higher Secondary)-(High)	-0.002	0.003	0.003	0.000	0.001	0.000	0.000	0.000	0.000
diff. (Higher Secondary)-(Middle)	0.001	0.003	0.004	0.002	0.002	0.001	0.000	0.000	0.001
diff. (Higher Secondary)-(Primary)	0.046***	0.022***	0.017***	0.008*	0.008*	0.004	0.000	0.006*	0.003
diff. (Higher Secondary)-(Mosque)	0.351***	0.288***	0.218***	0.106***	0.083***	0.055***	0.000	0.089***	0.104***
diff. (High)-(Middle)	0.003	0.000	0.002	0.002*	0.001	0.001*	0.000	0.000	0.000
diff. (High)-(Primary)	0.048***	0.019***	0.015***	0.008***	0.007***	0.004***	0.000	0.006***	0.002***
diff. (High)-(Mosque)	0.353***	0.284***	0.215***	0.106***	0.082***	0.055***	0.000	0.088***	0.104***
diff. (Middle)-(Primary)	0.045***	0.018***	0.013***	0.006***	0.005***	0.004***	0.000	0.006***	0.002***
diff. (Middle)-(Mosque)	0.350***	0.284***	0.214***	0.104***	0.081***	0.054***	0.000	0.089***	0.104***
diff. (Primary)-(Mosque)	0.305***	0.266***	0.200***	0.098***	0.076***	0.050***	0.000	0.083***	0.101***
School gender									
diff. (Female)-(Male)	0.051***	0.025***	0.016***	0.006***	0.005***	0.003***	0.000	0.002***	0.003***
School location									
diff. (Rural)-(Urban)	-0.036***	-0.018***	-0.011***	-0.004**	-0.004***	-0.002*	-0.000	-0.002*	-0.002**

*p<0.05, **p<0.01, ***p<0.001

Annex Table 287 EMIS: Availability of useable toilets, group-wise significance

Useable toilets	2012	2013	2014	2015	2016	2017	2018	2019
School level								
diff. (Higher Secondary)-(High)	-3.3*	-1.2	-0.8	-0.9	-0.6	0.3	-0.7	-0.8***
diff. (Higher Secondary)-(Middle)	-4.9***	-3.3***	-2.3***	-2.3***	-1.3**	-0.2	-1.8***	-1.4***

diff. (Higher Secondary)-(Primary)	-5.1***	-3.1***	-2.3***	-1.9***	-0.7	0.9	-0.5	-0.6
diff. (Higher Secondary)-(Mosque)	-4.1***	-1.9*	-0.6	-0.5	2.7**	4.7***	3.8***	-0.3
diff. (High)-(Middle)	-1.6**	-2.0***	-1.5***	-1.4***	-0.7***	-0.6*	-1.1***	-0.6***
diff. (High)-(Primary)	-1.8***	-1.9***	-1.5***	-1.0***	-0.1	0.5*	0.2	0.2
diff. (High)-(Mosque)	-0.8	-0.7	0.2	0.5	3.3***	4.3***	4.5***	0.6
diff. (Middle)-(Primary)	-0.2	0.1	0	0.4*	0.6***	1.1***	1.2***	0.8***
diff. (Middle)-(Mosque)	0.8	1.4**	1.7***	1.9***	4.0***	4.9***	5.5***	1.1***
diff. (Primary)-(Mosque)	1	1.2*	1.7***	1.5**	3.3***	3.8***	4.3***	0.4
School gender								
diff. (Female)-(Male)	-1.3***	-1.1***	-0.8***	-0.7***	-0.9***	-0.8***	0.2	-0.2**
School location								
diff. (Rural)-(Urban)	-0.8	0.5*	-0.6**	0.3	-0.6***	-0.3	-0.3	-0.2

*p<0.05, **p<0.01, ***p<0.001

Annex Table 288 EMIS: Average student-useable toilet ratio, group-wise significance

STR	2012	2013	2014	2015	2016	2017	2018	2019
School level								
diff. (Higher Secondary)-(High)	1.7	-0.8	-3.6	1.8	6.6*	9.7**	10.4***	8.9***
diff. (Higher Secondary)-(Middle)	29.9***	21.7***	18.8***	22.2***	24.4***	25.6***	27.3***	23.3***
diff. (Higher Secondary)-(Primary)	59.4***	52.4***	47.7***	46.2***	45.1***	44.1***	39.0***	33.9***
diff. (Higher Secondary)-(Mosque)	76.2***	66.9***	60.3***	56.1***	55.6***	52.3***	43.3***	40.5***
diff. (High)-(Middle)	28.2***	22.5***	22.4***	20.5***	17.7***	15.9***	16.9***	14.4***
diff. (High)-(Primary)	57.7***	53.2***	51.3***	44.4***	38.4***	34.4***	28.6***	25.0***
diff. (High)-(Mosque)	74.5***	67.7***	63.9***	54.3***	49.0***	42.7***	32.9***	31.6***
diff. (Middle)-(Primary)	29.5***	30.7***	28.9***	24.0***	20.7***	18.5***	11.8***	10.6***
diff. (Middle)-(Mosque)	46.3***	45.2***	41.5***	33.9***	31.2***	26.7***	16.0***	17.2***
diff. (Primary)-(Mosque)	16.7***	14.5***	12.6***	9.9***	10.6***	8.3***	4.3**	6.5***
School gender								
diff. (Female)-(Male)	-13.9***	-11.9***	-9.6***	-7.0***	-5.4***	-2.8***	-1.0***	-1.1***
School location								
diff. (Rural)-(Urban)	-29.4***	-28.1***	-27.1***	-23.6***	-22.3***	-23.5***	-19.5***	-15.2***

*p<0.05, **p<0.01, ***p<0.001

I.4.2 Infrastructure

I.4.2.1 Condition of school building

The EMIS survey records the condition of the school building as shown in the tables below. In 2012, for instance, only 60.0% of schools are in satisfactory condition and require no repairs.

Annex Table 289 EMIS: School building condition (%), 2012

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	60	28.1	4.6	1.7	5.7	51281
School level						
H.Sec.	48.5	34.6	3.3	0.2	13.4	612
High	46	35.5	4.9	0.9	12.6	5694
Middle	62.6	27.4	2.6	0.5	6.9	7771
Primary	62	27.1	4.7	1.9	4.3	36159
Mosque	54.1	22.5	15.8	5.8	1.8	1045
School gender						
Female	62.8	26.7	4	1.5	5	25639
Male	57.1	29.5	5.1	1.8	6.4	25642
School location						
Urban	62.6	27.2	3.6	1	5.6	5512
Rural	59.7	28.2	4.7	1.8	5.7	45769

Annex Table 290 EMIS: School building condition (%), 2013

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	56.7	30.6	4.5	1.7	6.5	52394
School level						
H.Sec.	45.3	36	3.3	0.5	14.9	658
High	45.6	36.5	4.6	0.6	12.8	6038
Middle	60.2	29.5	2.1	0.6	7.6	8194
Primary	58.2	29.9	4.7	2	5.2	36416
Mosque	50.2	27.1	14.8	6.1	1.8	1088
School gender						
Female	59.5	29.4	3.9	1.5	5.8	26519
Male	53.9	31.9	5.1	2	7.2	25874
School location						
Urban	58.6	30.1	3.9	0.8	6.6	5689
Rural	56.5	30.7	4.6	1.8	6.4	46705

Annex Table 291 EMIS: School building condition (%), 2014

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	55.7	30.9	3.9	1.8	7.8	49881
School level						
H.Sec.	41.3	40.6	4.4	0	13.6	653
High	43.1	38.4	3.6	0.6	14.4	5898
Middle	58.3	29.8	2.2	0.5	9.2	8015
Primary	57.6	29.7	4.1	2.3	6.3	34618
Mosque	47.6	26.8	15.8	7.5	2.3	697
School gender						
Female	58.4	29.9	3.3	1.6	6.8	25512
Male	52.8	31.9	4.5	2.1	8.8	24369
School location						
Urban	58	30.4	3.3	1.1	7.1	5501
Rural	55.4	30.9	3.9	1.9	7.9	44380

Annex Table 292 EMIS: School building condition (%), 2015

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	55.5	29.1	3.1	2.2	10.1	49767
School level						
H.Sec.	41.2	39.1	2	0.2	17.6	655
High	42.2	35.3	3.1	0.9	18.6	6085
Middle	57.5	28.3	1.6	0.8	11.8	8071
Primary	57.7	28.1	3.4	2.7	8.2	34335
Mosque	51.7	24.2	12.7	7.6	3.9	621
School gender						
Female	58	28.1	2.7	1.9	9.3	25809
Male	52.8	30.1	3.7	2.5	10.9	23958
School location						
Urban	56.2	29.4	2.7	1.4	10.2	5887
Rural	55.4	29	3.2	2.3	10.1	43880

Annex Table 293 EMIS: School building condition (%), 2016

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	63	26	2.5	1.5	6.9	48640
School level						
H.Sec.	51.3	34.9	2.6	0.2	11	647

High	50.1	33.5	2.6	0.4	13.5	6117
Middle	64.8	25.1	1.3	0.6	8.3	7976
Primary	65.3	24.7	2.7	1.9	5.4	33340
Mosque	56.6	23.4	10.4	5.5	4.1	560
School gender						
Female	64.9	25	2.3	1.3	6.5	25112
Male	61	27.2	2.8	1.7	7.4	23528
School location						
Urban	63.1	27.1	2.4	0.8	6.6	5804
Rural	63	25.9	2.6	1.6	7	42836

Annex Table 294 EMIS: School building condition (%), 2017

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	66.1	28.1	2.4	0.5	2.9	52184
School level						
H.Sec.	56.7	35.1	2.1	0	6.1	718
High	58.7	34	2.1	0.1	5.1	6652
Middle	69.4	25.9	1.5	0.1	3	8268
Primary	67.1	27.4	2.5	0.6	2.4	35977
Mosque	53.6	29.3	11.8	1.9	3.3	569
School gender						
Male	64.7	29.1	2.6	0.5	3.1	25342
Female	67.5	27.2	2.2	0.4	2.8	26842
School location						
Urban	67.7	26.7	2.5	0.2	3	5778
Rural	65.9	28.3	2.4	0.5	2.9	46398

Annex Table 295 EMIS: School building condition (%), 2018

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	74.9	17.3	3	1.1	3.7	52148
School level						
H.Sec.	70.5	19	2.7	0.7	7.2	749
High	68.4	20.9	2.8	0.4	7.6	6666
Middle	78.4	15.5	2	0.4	3.8	8276
Primary	75.6	17	3.2	1.4	2.9	36129
Mosque	59.8	18.9	14	5.2	2.1	328
School gender						
Male	73.8	17.8	3.4	1.2	3.9	24682
Female	75.9	16.8	2.7	1	3.5	27466
School location						

Urban	74.7	17.5	2.8	0.8	4.2	5982
Rural	74.9	17.2	3.1	1.1	3.6	46166

Annex Table 296 EMIS: School building condition (%), 2019

	Satisfactory	Need small repair	Need complete repair	Whole building is dangerous	Part of building is dangerous	Obs.
	%	%	%	%	%	#
Overall	79.4	11.1	3.4	1.3	4.8	52164
School level						
H.Sec.	75.7	10.8	3.3	0.7	9.6	760
High	73.8	13.4	3.2	0.4	9.2	6754
Middle	81.8	10.6	2.4	0.6	4.6	8327
Primary	80	10.8	3.7	1.7	3.9	36180
Mosque	59.4	18.9	11.2	4.2	6.3	143
School gender						
Male	78	11.8	3.8	1.4	5	24643
Female	80.6	10.4	3.1	1.2	4.6	27521
School location						
Urban	79.3	11.1	3.4	0.9	5.3	5963
Rural	79.4	11.1	3.4	1.4	4.7	46201

I.4.2.2 Boundary wall

Similar to facilities, the enumerator has to record the presence of a boundary wall. In 2012, for instance, 89.2% of schools have a boundary wall.

Annex Table 297 EMIS: Presence of boundary wall

	2012		2013		2014		2015		2016		2017		2018		2019		2020	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	Obs.	%	Obs.	%
Overall	47749	89.2	47673	90.7	49307	94.2	51033	97.8	50993	97.7	51501	98.3	51010	97.4	51406	98	47212	97.9
School level																		
H.Sec.	623	98.3	650	98.8	664	99.3	670	99.6	676	99.4	717	99.7	745	99.5	756	99.5	765	99.4
High	5611	94.8	5814	96.3	5973	97.6	6211	99.3	6363	99.4	6632	99.5	6588	98.8	6689	99	7922	99
Middle	7625	95.1	7842	95.7	8130	97.8	8339	99.2	8285	99.1	8226	99.4	8161	98.6	8240	99	7079	98.8
Primary	33165	88.1	32707	89.6	33944	93.5	35174	97.6	35055	97.3	35358	98	35174	97	35549	97.6	31307	97.6
Mosque	725	53.5	660	55.2	596	63.9	639	80.8	614	84	568	88.5	342	79	172	76.4	139	72.4
School gender																		
Female	25896	97.2	25912	97.7	26309	98.5	26859	99.5	26728	99.3	26740	99.4	27165	98.8	27356	99.2	25261	99.1
Male	21853	81.2	21760	83.5	22998	89.7	24174	96.1	24265	95.9	24761	97.1	23845	95.8	24050	96.6	21951	96.6
School location																		
Urban	5594	96.9	5564	97.7	5706	98.4	6071	98.8	6170	99.3	5764	99.5	5945	98.9	5946	99.1	5609	98.8
Rural	42155	88.2	42109	89.8	43601	93.7	44962	97.7	44823	97.5	45729	98.1	45065	97.2	45460	97.8	41603	97.8

If a school has a boundary wall, the follow-up question is whether this wall is complete, incomplete or in bad condition. The table below provides the percentage of complete boundary walls in those school that have boundary walls. For instance, out of the schools that have boundary walls in 2012, 86.7% of those wall will be complete.

Annex Table 298 EMIS: Percentage of complete boundary walls

	2012		2013		2014		2015		2016		2017		2018		2019	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	Obs.	%
Overall	40441	86.7	40017	85.7	41339	85.6	43926	88.5	45127	89.6	45889	89.3	44327	86.7	45925	89.4
School level																
H.Sec.	524	87.0	540	85	534	82.2	596	91.1	622	93.1	665	92.9	672	90.1	692	91.5
High	4523	82.2	4679	82.2	4756	81.3	5408	89.3	5723	91.2	5975	90.1	5752	87.2	5938	88.8
Middle	6563	87.9	6691	87.1	6966	87.3	7315	89.7	7414	90.6	7426	90.4	7168	87.7	7472	90.7
Primary	28260	87.2	27558	86.0	28608	86.1	30132	88.1	30841	89.1	31345	88.9	30443	86.3	31670	89.2
Mosque	571	82.0	549	83.8	475	82	475	84.5	527	87.4	478	86.1	292	84.6	153	89
School gender																
Female	22866	90.4	22459	88.7	22773	88.4	23669	89.9	23870	90.5	24103	90.3	23847	87.7	24663	90.2
Male	17575	82.2	17557	82.1	18566	82.3	20257	86.8	21257	88.6	21786	88.3	20480	85.6	21262	88.5
School location																
Urban	5071	93.6	5025	92.8	5007	90.6	5425	92.2	5700	93.7	5398	93.7	5390	90.6	5498	92.5
Rural	35370	85.8	34992	84.8	36332	84.9	38501	88	39427	89.1	40484	88.8	38937	86.2	40427	89

The tables below show the difference in presence and completion of boundary walls within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 299 EMIS: Presence of boundary walls, group-wise significance

Boundary Presence	2012	2013	2014	2015	2016	2017	2018	2019	2020
School level									
diff. (Higher Secondary)-(High)	0.034***	0.025***	0.017**	0.002	0.000	0.002	0.007	0.005	0.004
diff. (Higher Secondary)-(Middle)	0.032***	0.031***	0.015**	0.003	0.003	0.004	0.009*	0.005	0.006
diff. (Higher Secondary)-(Primary)	0.101***	0.092***	0.058***	0.020***	0.021***	0.018***	0.025***	0.018***	0.018**
diff. (Higher Secondary)-(Mosque)	0.447***	0.436***	0.353***	0.188***	0.154***	0.112***	0.205***	0.230***	0.270***
diff. (High)-(Middle)	-0.003	0.006	-0.002	0.001	0.003	0.002	0.002	0.000	0.002
diff. (High)-(Primary)	0.067***	0.067***	0.041***	0.017***	0.021***	0.016***	0.018***	0.014***	0.014***
diff. (High)-(Mosque)	0.413***	0.411***	0.336***	0.185***	0.154***	0.111***	0.198***	0.225***	0.266***
diff. (Middle)-(Primary)	0.070***	0.061***	0.043***	0.016***	0.019***	0.014***	0.016***	0.013***	0.012***
diff. (Middle)-(Mosque)	0.416***	0.405***	0.338***	0.185***	0.151***	0.109***	0.196***	0.225***	0.264***
diff. (Primary)-(Mosque)	0.346***	0.344***	0.295***	0.168***	0.133***	0.095***	0.180***	0.212***	0.252***

School gender									
diff. (Female)-(Male)	0.160***	0.141***	0.088***	0.034***	0.034***	0.022***	0.030***	0.026***	0.025***
School location									
diff. (Rural)-(Urban)	-0.087***	-0.079***	-0.048***	-0.011***	-0.019***	-0.013***	-0.018***	-0.013***	-0.010***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 300 EMIS: Completion of boundary walls, group-wise significance

Boundary Complete	2012	2013	2014	2015	2016	2017	2018	2019
School level								
diff. (Higher Secondary)-(High)	0.048**	0.028	0.008	0.019	0.019	0.027*	0.029*	0.027*
diff. (Higher Secondary)-(Middle)	-0.009	-0.021	-0.051***	0.015	0.026*	0.025*	0.024	0.008
diff. (Higher Secondary)-(Primary)	-0.002	-0.01	-0.039**	0.030*	0.040***	0.040***	0.037**	0.024*
diff. (Higher Secondary)-(Mosque)	0.050*	0.012	0.001	0.066***	0.057***	0.068***	0.054**	0.026
diff. (High)-(Middle)	-0.057***	-0.049***	-0.060***	-0.004	0.006	-0.003	-0.005	-0.019***
diff. (High)-(Primary)	-0.050***	-0.038***	-0.047***	0.012**	0.021***	0.012**	0.009	-0.003
diff. (High)-(Mosque)	0.002	-0.016	-0.007	0.048***	0.038**	0.040**	0.026	-0.001
diff. (Middle)-(Primary)	0.007	0.011*	0.012**	0.016***	0.015***	0.015***	0.014***	0.015***
diff. (Middle)-(Mosque)	0.059***	0.033*	0.053***	0.051***	0.032*	0.043**	0.031	0.017
diff. (Primary)-(Mosque)	0.052***	0.022	0.040**	0.036**	0.017	0.028*	0.017	0.002
School gender								
diff. (Female)-(Male)	0.082***	0.066***	0.061***	0.031***	0.019***	0.020***	0.020***	0.018***
School location								
diff. (Rural)-(Urban)	-0.078***	-0.080***	-0.057***	-0.042***	-0.046***	-0.049***	-0.043***	-0.035***

*p<0.05, **p<0.01, ***p<0.001

I.4.2.3 Student-Classroom ratio

The student-classroom ratio, or the number of students per classroom, has been calculated in the AEPAM reports. The following formula was used:

Student-classroom ratio = [total number of students/total number of classrooms[69]]

[69] In EMIS 2019 and 2020 the student-classroom ratio has been calculated from 'functional classrooms' data. Previous calculations used the 'classrooms' data.

The table below shows the mean of this ratio. In 2012, for instance, there are around 41 children to 1 classroom.

Annex Table 301 EMIS: Mean student-classroom ratio

	2012	2013	2014	2015	2016	2017	2018	2019	2020
Overall	40.7	41.6	40.8	39.3	43.0	49.1	48.7	44.3	39.9
School level									
H.Sec.	49.9	50.7	52.0	49.6	52.5	60.5	58.1	55.9	53.8
High	48.9	49.1	49.1	46.3	49.4	53.9	53.0	50.4	47.0
Middle	38.0	39.3	39.0	37.2	39.3	44.1	43.7	40.7	38.1
Primary	39.8	40.7	39.6	38.4	42.5	49.1	48.8	43.8	38.2
Mosque	41.3	41.5	40.7	40.2	44.7	53.2	52.7	41.3	32.3
School gender									
Female	38.7	39.6	39.3	37.8	41.4	47.7	47.3	43.1	38.9
Male	42.7	43.7	42.4	41.0	44.7	50.6	50.3	45.7	41.1
School location									
Urban	49.4	49.9	49.5	45.5	48.8	54.9	53.4	49.6	47.1
Rural	39.7	40.6	39.7	38.5	42.2	48.4	48.1	43.6	38.9

The table below shows the difference in student-classroom ratios within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 302 EMIS: Average student-classroom ratio, group-wise significance

SCR	2012	2013	2014	2015	2016	2017	2018	2019	2020
School level									
diff. (Higher Secondary)-(High)	1	1.6	2.9**	3.3***	3.1**	6.6***	5.1***	5.5***	6.8***
diff. (Higher Secondary)-(Middle)	11.9***	11.4***	13.0***	12.4***	13.2***	16.4***	14.5***	15.2***	15.7***
diff. (Higher Secondary)-(Primary)	10.0***	10.0***	12.4***	11.2***	10.0***	11.4***	9.3***	12.1***	15.6***
diff. (Higher Secondary)-(Mosque)	8.5***	9.2***	11.3***	9.4***	7.8***	7.3***	5.5**	14.6***	21.5***
diff. (High)-(Middle)	10.9***	9.8***	10.1***	9.2***	10.1***	9.7***	9.3***	9.7***	8.9***
diff. (High)-(Primary)	9.0***	8.4***	9.5***	8.0***	6.9***	4.8***	4.2***	6.6***	8.7***
diff. (High)-(Mosque)	7.5***	7.7***	8.4***	6.2***	4.7***	0.7	0.3	9.1***	14.7***
diff. (Middle)-(Primary)	-1.8***	-1.4***	-0.6*	-1.2***	-3.2***	-5.0***	-5.2***	-3.0***	-0.1
diff. (Middle)-(Mosque)	-3.3***	-2.1**	-1.7*	-3.0***	-5.4***	-9.1***	-9.0***	-0.6	5.8**

diff. (Primary)-(Mosque)	-1.5	-0.7	-1.1	-1.8	-2.2	-4.1**	-3.8*	2.4	6.0**
School gender									
diff. (Female)-(Male)	-4.0***	-4.1***	-3.2***	-3.2***	-3.3***	-3.0***	-2.9***	-2.6***	-2.2***
School location									
diff. (Rural)-(Urban)	-9.7***	-9.3***	-9.8***	-7.0***	-6.6***	-6.5***	-5.4***	-5.9***	-8.2***

*p<0.05, **p<0.01, ***p<0.001

I.5 Management and Governance

I.5.1 Activity of school councils

Accountability of the school can also be measured through the existence of school councils. This data has not been made available for the 2019 and 2020 rounds.

This section presents the average number of school council meetings held in the previous financial year.

Annex Table 303 EMIS: Average number of SC meetings

	2012		2013		2014		2015		2016		2017		2018	
	Mean	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**
Overall	8.3	50421	8.0	49259	8.6	49783	8.9	50116	8.4	52231	8.4	52394	10.5	52390
School level														
H.Sec.	9.1	562	8.9	568	9.8	606	10.5	626	10.6	680	10.6	719	16.9	749
High	9.2	5355	8.9	5326	9.6	5604	10.2	5992	10.0	6402	10.2	6663	14.1	6668
Middle	9.4	7815	8.9	7988	9.9	8171	10.2	8198	10.0	8358	10.0	8279	12.2	8277
Primary	8.0	35945	7.6	34748	8.2	34901	8.4	34856	7.8	36059	7.8	36091	9.4	36263
Mosque	5.8	744	5.3	629	5.6	501	5.9	444	3.0	732	3.4	642	5.4	433
School gender														
Female	8.3	25275	8.0	25149	8.7	25649	9.0	26081	8.5	26925	8.5	26906	10.9	27499
Male	8.3	25146	8.0	24109	8.6	24134	8.9	24035	8.3	25306	8.3	25488	10.1	24891
School location														
Urban	9.1	5349	8.8	5291	9.3	5475	9.7	5910	9.2	6215	9.4	5794	12.0	6010
Rural	8.2	45072	7.9	43968	8.5	44308	8.8	44206	8.3	46016	8.3	46592	10.3	46380

The average number of school council members has also been calculated. For example the table below shows that in 2012 there were around 7 members per school council, on average.

Annex Table 304 EMIS: Average number of SC members

	2012		2013		2014		2015		2016		2017		2018	
	Mean	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**	**Mean**	**#**
Overall	7.4	52186	7.7	51345	8.3	51353	9.3	51470	8.8	52231	9.1	52394	9.4	52390
School level														
H.Sec.	9.0	593	9.1	605	9.2	630	9.6	661	9.6	680	10.3	719	10.6	749
High	8.7	5604	8.7	5649	8.8	5829	9.3	6165	9.3	6402	10.1	6663	10.3	6668
Middle	7.5	7986	7.7	8162	8.4	8291	9.8	8372	9.7	8358	10.2	8279	10.4	8277
Primary	7.2	37103	7.5	36118	8.2	36001	9.2	35743	8.6	36059	8.7	36091	8.9	36263
Mosque	7.0	900	7.1	811	7.8	602	8.1	529	4.7	732	6.1	642	6.8	433
School gender														
Female	7.4	26188	7.6	26107	8.3	26377	9.2	26750	8.8	26925	9.1	26906	9.4	27499
Male	7.5	25998	7.7	25237	8.4	24976	9.4	24720	8.8	25306	9.1	25488	9.4	24891
School location														
Urban	7.7	5563	7.9	5490	8.3	5629	9.4	6037	9.0	6215	9.5	5794	9.7	6010
Rural	7.4	46623	7.7	45855	8.3	45724	9.3	45433	8.8	46016	9.1	46592	9.3	46380

The table below shows the difference in school council members and meetings within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 305 EMIS: Average SC meetings, group-wise significance

Meetings	2012	2013	2014	2015	2016	2017	2018
School level							
diff. (Higher Secondary)-(High)	0	0	0.2	0.3	0.7^{**}	0.4	2.8^{***}
diff. (Higher Secondary)-(Middle)	-0.3	0	-0.1	0.3	0.7^{***}	0.6^{**}	4.7^{***}
diff. (Higher Secondary)-(Primary)	1.2^{***}	1.3^{***}	1.6^{***}	2.0^{***}	2.8^{***}	2.8^{***}	7.4^{***}
diff. (Higher Secondary)-(Mosque)	3.4^{***}	3.6^{***}	4.2^{***}	4.6^{***}	7.6^{***}	7.2^{***}	11.4^{***}
diff. (High)-(Middle)	-0.3^{**}	0	-0.3^{***}	0	0	0.2^{**}	1.9^{***}
diff. (High)-(Primary)	1.2^{***}	1.3^{***}	1.4^{***}	1.7^{***}	2.1^{***}	2.5^{***}	4.6^{***}

diff. (High)-(Mosque)	3.4***	3.6***	3.9***	4.3***	7.0***	6.9***	8.6***
diff. (Middle)-(Primary)	1.5***	1.3***	1.7***	1.7***	2.1***	2.2***	2.8***
diff. (Middle)-(Mosque)	3.6***	3.6***	4.2***	4.3***	7.0***	-6.6***	6.8***
diff. (Primary)-(Mosque)	2.2***	2.3***	2.6***	2.6***	4.8***	-4.4***	4.0***
School gender							
diff. (Female)-(Male)	0.0	0.0	0.1**	0.1***	0.2***	-0.2***	-0.7***
School location							
diff. (Rural)-(Urban)	-0.9***	-0.9***	-0.7***	-0.9***	-0.9***	1.1***	1.7***

*p<0.05, **p<0.01, ***p<0.001

Annex Table 306 EMIS: Average SC members, group-wise significance

Members	2012	2013	2014	2015	2016	2017	2018
School level							
diff. (Higher Secondary)-(High)	0.4***	0.4***	0.3***	0.3***	0.3**	0.3**	0.2*
diff. (Higher Secondary)-(Middle)	1.6***	1.3***	0.8***	-0.2	-0.2	0.1	0.1
diff. (Higher Secondary)-(Primary)	1.8***	1.6***	1.0***	0.3***	1.0***	1.6***	1.6***
diff. (Higher Secondary)-(Mosque)	2.1***	2.0***	1.4***	1.4***	4.9***	4.3***	3.8***
diff. (High)-(Middle)	1.2***	1.0***	0.4***	-0.5***	-0.5***	-0.1**	-0.1*
diff. (High)-(Primary)	1.4***	1.2***	0.7***	0	0.7***	1.4***	1.4***
diff. (High)-(Mosque)	1.7***	1.7***	1.1***	1.1***	4.6***	4.0***	3.5***
diff. (Middle)-(Primary)	0.2***	0.2***	0.2***	0.5***	1.1***	1.5***	1.5***
diff. (Middle)-(Mosque)	0.5***	0.7***	0.6***	1.6***	5.1***	-4.1***	3.6***
diff. (Primary)-(Mosque)	0.3***	0.4***	0.4***	1.1***	3.9***	-2.6***	2.1***
School gender							
diff. (Female)-(Male)	-0.1***	0.1***	0.1***	0.1***	0.0	-0.0	0.0
School location							
diff. (Rural)-(Urban)	-0.3***	-0.2***	0.0	-0.1	-0.2***	0.4***	0.3***

*p<0.05, **p<0.01, ***p<0.001

I.5.2 Non-salary budget spending

We use the reported expenditure and received NSB funds which the EMIS reports through head teacher's records. We use this as a proxy to teacher autonomy and willingness to spend NSB budget allocations. We report the mean percentage of expenditure as a percentage of total received funds. This allows us to see how much the school teacher has spent out of the funds that they received. NSB information has not been made available from 2018 onwards.

For robustness purposes, we have removed all observations who's percentage spent exceeds 105%. This means that the following tables do not contain information for schools who have reportedly spent more than they have received in a year.

In the below table the 77.1% represents the average amount utilized by a school in Punjab in the 2011/12 financial year and spent by the head teacher, while 32.4% represents the standard deviation in the teacher spending.

Annex Table 307 EMIS: Average NSB spending

	2011-12			2012-13			2013-14			2014-15			2015-16			2016-17		
	#	Mean %	SD	#	Mean %	SD	#	Mean %	SD	#	Mean %	SD	#	Mean %	SD	#	Mean %	SD
Overall	15,556	77.1	32.4	27,614	45.6	42	30,024	61.7	40.9	21,878	78	28.9	38,889	64.3	34.1	14,659	48.8	34.9
School level																		
Primary	12,418	77.4	32.8	21,892	45.1	42.3	22,410	60.5	41.3	15,160	76.9	29.3	25,763	60.3	33.9	10007	49.45	33.73
Middle	2,549	75.3	30.8	4,811	48	39.3	5,070	65.9	37.7	3,971	77.2	29.2	6,147	62.6	33.4	2197	52.46	32.33
Higher Secondary	489	76.8	33.5	700	47.2	45.7	2,426	65.3	42	2,729	85.3	24.1	6,967	80.5	30.4	201	50.67	42.34
School gender																		
Female	7,945	75.9	32.5	14,127	44.5	41.6	16,043	61.7	40.4	11,409	75.4	30	20,104	61.9	34.4	7803	48.84	34.94
Male	7,611	78.4	32.4	13,487	46.9	42.3	13,981	61.7	41.4	10,469	80.9	27.3	18,785	66.9	33.5	6856	48.8	34.85
School location																		
Urban	1,468	77.4	31.9	2,450	50.8	41.5	2,894	64.9	39.6	2,507	80.8	28.2	4,757	68	34.1	1542	49.52	36.7
Rural	14,088	77.1	32.5	25,164	45.1	42	27,130	61.3	41	19,371	77.7	28.9	34,132	63.8	34	13115	48.74	34.68
*This includes only those observations which are deemed to be robust i.e. the current year's expenditure does not exceed amount allocated.																		

I.6 Teacher Effectiveness

In the teacher effective category, the student-teacher ratio and years of experience indicators have been calculated.

I.6.1 Student-teacher ratio

The student-teacher ratio has been calculated through the following formula:

Student-teacher ratio: [total number of students per school/total number of teachers per school]

The table below provides the average student-teacher ratio. In 2012, there are around 37 students to 1 teacher in a school.

Annex Table 308 EMIS: Average student-teacher ratio

	2012	2013	2014	2015	2016	2017	2018	2019[70]	2020
Overall	37.4	40.2	38.8	35.8	38.7	36.9	40.4	31.4	30.3
School level									
H.Sec.	29.6	31.0	31.8	31.2	31.4	39.9	35.4	34.7	35.6
High	29.6	31.6	32.2	30.5	31.5	39.4	31.9	31.9	31.5
Middle	28.9	32.0	30.8	27.9	30.9	42.4	28.4	29.5	28.5
Primary	40.2	43.3	41.7	38.5	41.8	34.8	44.8	31.8	30.3
Mosque	46.1	49.7	45.2	41.6	44.2	36.7	37.7	26.8	23.8
School gender									
Female	35.7	38.4	37.6	35.2	37.9	37.1	40.2	31.5	30.7
Male	39.0	42.0	40.0	36.5	39.6	36.6	40.6	31.4	29.8
School location									
Urban	33.1	35.2	35.2	34.1	34.4	36.4	40.4	31.8	30.6
Rural	37.9	40.8	39.2	36.0	39.3	40.9	40	31.4	30.3

[70] The student-teacher ratio in 2019 is calculated for SED schools only (teacher information is not available for PEIMA schools in the raw data).

I.6.2 Teacher experience (years)

The tables below show the average experience among teachers in their current school as well as in the School Education Department (SED). In 2012, for instance, teachers on average have experience of 8.6 years in their current school. Teacher experience information is not available in the 2017, 2019 and 2020 rounds.

Annex Table 309 EMIS: Average teacher experience (years) in current school

	2012	2013	2014	2015	2016	2017	2018
Overall	8.6	9.0	8.9	8.6	9.0	No data	7.6
Gender							
Female	8.4	8.9	8.8	8.4	8.4		7.2
Male	8.8	9.1	9.0	8.9	9.7		8.1

Annex Table 310 EMIS: Average teacher experience (years) in SED

	2012	2013	2014	2015	2016	2017	2018
Overall	17.0	17.6	17.5	16.5	15.7	No data	14.0
Gender							
Female	16.0	16.7	16.6	15.5	14.4		12.7
Male	18.0	18.5	18.4	17.6	17.3		15.5

Annex J Education Indicators in the Private School Census

J.1 Indicators and disaggregation

This annex presents education indicators that have been derived from the Private School Census (PSC) data, for the Punjab province, conducted in 2011 and 2016. The table below presents a list of indicators that have been generated using information from the survey.

Annex Table 311 PSC: List of indicators

Student Level	School Level
Enrolment	School environment [facilities and infrastructure]
	Teacher Effectiveness

In order to calculate gross enrolment, the information on enrolment from the survey needs to be supplemented with population estimates. Given that census data on Pakistan is not publicly available, we relied on population estimates from the United Nations, Department of Economic and Social Affairs, Population Division. The data for 2011 and 2016 was downloaded from their website.71 The population estimates are disaggregated by gender and age. The table below shows the UN age categories which have been taken to coincide with the various class levels in the PSC.

Annex Table 312 PSC: Age groups and class levels

Age group	Class level
0-4 years	Pre-Primary: Pre Nursery, Nursery and Prep
5-9 years	Primary: Classes 1-5
10-14 years	Middle: Classes 6-8

Unfortunately, gross enrolment could not be calculated for the 'High', 'Higher Secondary' or 'Inter College' class levels as the UN population data did not have corresponding age categories for these class levels.

Since the UN population data is only available for Pakistan overall, and is not disaggregated by province, the population estimates had to be further supplemented with information on the share of the population that lives in Punjab from the Pakistan Labour Force Survey (LFS). The 2010/11 LFS survey is used to find the share for the 2011 PSC and the 2014/15 LFS survey is used to find the share for the 2016 PSC.

The following variables are available to better understand the variation in education indicators.

J.1.1 School type

The PSC provides information on type of school. The categories used for this analysis are school level which includes Inter College, Higher Secondary, High, Middle and Primary schools. A variable that accounts for the official gender, girls, boys or both, of the schools has also been added.

[71] https://esa.un.org/unpd/wpp/DataQuery/

J.1.2 Geographical variables

To understand spatial variation, an urban/rural categorical variable is included in this analysis.

J.2 Gross enrolment ratio (GER)

The enrolment indicators have been calculated in line with the formulas identified in the DQA document. Since enrolment information is only available by grade and not age, only the gross enrolment ratio (GER) can be calculated. This measures participation in schooling by educational level. The formula for primary GER is:

GER = [number of children in primary school]/[total population of children at primary age]

GER is all the people that are enrolled at a certain level of education over the number of people that correspond to that level of education. The tables below show overall, and gender wise, GER at the pre-primary, primary and middle level. Each of these variables has increased over the period of 2011 to 2016.

Annex Table 313 PSC: Pre-primary GER (%)

	2011	2016
Overall	16.2	23.2
Gender		
Female	15.3	22.6
Male	17.1	23.8

Annex Table 314 PSC: Primary (class 1-5) GER (%)

	2011	2016
Overall	31.5	38.1
Gender		
Female	30.2	37.0
Male	32.8	39.2

Annex Table 315 PSC: Middle (class 6-8) GER (%)

	2011	2016
Overall	10.8	13.0
Gender		
Female	10.8	13.0
Male	10.8	12.9

Note that, unlike the EMIS data analysis, participation and net enrolment variables cannot be generated from the PSC data, because these indicators require information on children's ages which the PSC does not collect.

J.3 School environment

The PSC gather detailed information on the availability of facilities and the physical infrastructure of the school building. The specific variables selected for analysis are:

Annex Table 316 PSC: School environment Indicators

Facilities	Infrastructure
Electricity	Boundary Wall
Drinking Water	Student-Classroom Ratio
Toilets	

J.3.1 Facilities

In the PSC there is a checklist of variables and the enumerator has to record whether each facility is available (yes/no). The below analysis shows the availably of electricity, drinking water and toilets.

% availability = [facility is available/ facility is available + facility is not available]*100

J.3.1.1 Electricity

The table below provides overall percentages of electricity availability and disaggregations by school level, gender and location in 2011 and 2016.

Annex Table 317 PSC: Availability of electricity

	2011		2016	
	#	%	#	%
Overall	42001	97.1	58442	96.6
School level				
Primary	10385	92.5	20791	92.3
Middle	18246	98.3	24263	98.9
High	11511	99.3	12250	99.6
Higher Secondary	1411	99.7	1138	99.3
Inter College	448	99.3		
School gender				
Male	2577	97.9	2387	98.3
Female	3233	97.4	3718	98.3
Both	36191	97.1	52337	96.4
School location				
Urban	17164	99.5	21691	99.3
Rural	24837	95.5	36751	95.1

The table below shows the difference in electricity availability within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 318 PSC: Availability of electricity, group-wise significance

	2011	2016
School level		
diff. (Higher Secondary)-(High)	0.004	-0.003

diff. (Higher Secondary)-(Middle)	0.014***	0.004
diff. (Higher Secondary)-(Primary)	0.072***	0.070***
diff. (Higher Secondary)-(Inter College)	-0.004	
diff. (High)-(Middle)	0.010***	0.007***
diff. (High)-(Primary)	0.068***	0.073***
diff. (High)-(Inter College)	0	
diff. (Middle)-(Primary)	0.058***	0.066***
diff. (Middle)-(Inter College)	0.01	
diff. (Primary)-(Inter College)	0.069***	
School gender		
diff. (Female)-(Both)	-0.004	-0.019***
diff. (Male)-(Both)	-0.008*	-0.019***
diff. (Female)-(Male)	-0.005	0
School location		
diff. (Rural) – (Urban)	-0.040***	-0.042***

*p<0.05, **p<0.01, ***p<0.001

J.3.1.2 Drinking Water

The table below provides overall percentages of drinking water availability and disaggregations by school level, gender and location in 2011 and 2016.

Annex Table 319 PSC: Availability of drinking water

	2011		2016	
	#	%	#	%
Overall	40745	98.7	60041	99.2
School level				
Primary	10267	97.0	22183	98.5
Middle	17516	99.1	24448	99.6
High	11159	99.5	12269	99.8
Higher Secondary	1371	99.3	1141	99.6
Inter College	432	98.9		
School gender				
Male	2512	99.1	2424	99.8
Female	3169	98.6	3765	99.5
Both	35064	98.7	53852	99.2
School location				
Urban	16179	99.7	21793	99.8
Rural	24566	98.0	38248	98.9

The table below shows the difference in drinking water availability within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 320 PSC: Availability of drinking water, group-wise significance

Drinking Water	2011	2016
School level		
diff. (Higher Secondary)-(High)	0	0
diff. (Higher Secondary)-(Middle)	0	0
diff. (Higher Secondary)-(Primary)	0.0***	0.0**
diff. (Higher Secondary)-(Inter College)	0	
diff. (High)-(Middle)	0.0***	0.0*
diff. (High)-(Primary)	0.0***	0.0***
diff. (High)-(Inter College)	0	
diff. (Middle)-(Primary)	0.0***	0.0***
diff. (Middle)-(Inter College)	0	
diff. (Primary)-(Inter College)	0.0*	
School gender		
diff. (Female)-(Both)	0	-0.0*
diff. (Male)-(Both)	0	-0.0**
diff. (Female)-(Male)	0	0
School location		
diff. (Rural) – (Urban)	-0.0***	-0.0***

*p<0.05, **p<0.01, ***p<0.001

J.3.1.3 Toilets

The table below provides overall percentages of toilet availability and disaggregations by school level, gender and location in 2011 and 2016.

Annex Table 321 PSC: Availability of toilets

	2011		2016	
	#	%	#	%
Overall	41654	96.4	58279	96.3
School level				
Primary	10162	90.5	20527	91.1
Middle	18172	97.9	24366	99.3
High	11476	99.1	12246	99.6
Higher Secondary	1396	98.7	1140	99.5
Inter College	448	99.3		
School gender				
Male	2558	97.2	2394	98.6
Female	3225	97.2	3712	98.1
Both	35871	96.2	52173	96.1
School location				
Urban	17147	99.6	21666	99.2
Rural	24507	94.3	36613	94.7

The table below shows the difference in toilet availability within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 322 PSC: Availability of toilets, group-wise significance

Toilets	2011	2016
School level		
diff. (Higher Secondary)-(High)	-0.003	-0.001
diff. (Higher Secondary)-(Middle)	0.008*	0.002
diff. (Higher Secondary)-(Primary)	0.082***	0.083***
diff. (Higher Secondary)-(Inter College)	0.006	
diff. (High)-(Middle)	0.011***	0.003***
diff. (High)-(Primary)	0.085***	0.085***
diff. (High)-(Inter College)	0.003	
diff. (Middle)-(Primary)	0.074***	0.082***
diff. (Middle)-(Inter College)	0.014*	
diff. (Primary)-(Inter College)	0.088***	
School gender		
diff. (Female)-(Both)	-0.010**	-0.020***
diff. (Male)-(Both)	-0.009*	-0.025***
diff. (Female)-(Male)	0	-0.005
School location		
diff. (Rural)-(Urban)	-0.053***	-0.045***

*p<0.05, **p<0.01, ***p<0.001

Note: Unlike EMIS, the PSC does not have a variable which records the condition of the toilets and distinguishes between ‘usable’ and ‘unusable’ toilets.

J.3.1 Infrastructure

J.3.1.1 Presence of boundary wall

Similar to facilities, the enumerator has to record the presence of a boundary wall (yes/no). The table below records this in percentages. For instance, in 2011, 97.3% of private schools had a boundary wall. This rose to 100% in 2016.

Annex Table 323 PSC: Presence of a boundary wall

	2011		2016	
	#	%	#	%
Overall	40204	97.3	60502	100
School level				
Primary	9920	93.6	22525	100
Middle	17395	98.4	24535	100
High	11103	99.0	12296	100
Higher Secondary	1358	98.2	1146	100
Inter College	428	97.9		
School gender				
Male	2467	97.2	2429	100
Female	3154	98.0	3784	100
Both	34583	97.3	54289	100
School location				

Urban	16078	99.1	21845	100
Rural	24126	96.2	38657	100

The table below shows the difference in boundary wall presence within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 324 PSC: Presence of a boundary wall, group-wise significance

Boundary Wall	2011	2016
School level		
diff. (Higher Secondary)-(High)	-0.008**	-0.008*
diff. (Higher Secondary)-(Middle)	-0.002	-0.006
diff. (Higher Secondary)-(Primary)	0.046***	0.052***
diff. (Higher Secondary)-(Inter College)	-0.003	
diff. (High)-(Middle)	0.006***	0.002
diff. (High)-(Primary)	0.054***	0.060***
diff. (High)-(Inter College)	-0.011*	
diff. (Middle)-(Primary)	0.048***	0.058***
diff. (Middle)-(Inter College)	-0.005	
diff. (Primary)-(Inter College)	0.044***	
School gender		
diff. (Female)-(Both)	-0.007*	-0.014***
diff. (Male)-(Both)	0	-0.019***
diff. (Female)-(Male)	0.008	-0.004
School location		
diff. (Rural)-(Urban)	-0.029***	-0.028***

*p<0.05, **p<0.01, ***p<0.001

Note: In EMIS, if the school had a boundary wall, the enumerator asked a follow up question regarding the status of the wall: whether it was complete, incomplete or in bad condition. The PSC does not contain a follow up question regarding the status of the wall.

J.3.1.2 Student-classroom ratio

The student-classroom ratio, or the number if students per classroom, has been calculated in the AEPAM reports. The following formula was used:

Student-classroom ratio = [total number of students/total number of classrooms]

The table below shows the mean of this ratio. For instance, in 2011, there are around 24 children per classroom.

Annex Table 325 PSC: Average student-classroom ratio

	2011	2016
Overall	24.4	23.1
School level		
Primary	26.7	26.0
Middle	24.1	21.2
High	23.0	21.6
Higher Secondary	22.4	21.6
Inter College	18.2	
School gender		
Male	23.0	21.8
Female	22.8	21.5
Both	24.6	23.2
School location		
Urban	21.7	20.2
Rural	26.1	24.7

The table below shows the difference in student-classroom ratio within each school type – level, gender and location. Stars are used to denote statistical significance.

Annex Table 326 PSC: Average student-classroom ratio, group-wise significance

SCR	2011	2016
School level		
diff. (Higher Secondary)-(High)	0.6	0
diff. (Higher Secondary)-(Middle)	1.7***	-0.4
diff. (Higher Secondary)-(Primary)	4.2***	4.4***
diff. (Higher Secondary)-(Inter College)	4.2**	
diff. (High)-(Middle)	1.1***	-0.4**
diff. (High)-(Primary)	3.6***	4.4***
diff. (High)-(Inter College)	4.8***	
diff. (Middle)-(Primary)	2.5***	4.8***
diff. (Middle)-(Inter College)	5.9***	
diff. (Primary)-(Inter College)	8.5***	
School gender		
diff. (Female)-(Both)	-1.8***	-1.8***
diff. (Male)-(Both)	-1.6***	-1.5***
diff. (Female)-(Male)	0.2	0.3
School location		
diff. (Rural)-(Urban)	-4.4***	-4.5***

*p<0.05, **p<0.01, ***p<0.001

J.4 Teacher Effectiveness

One way to proximate teacher effectiveness is through the student-teacher ratio, calculated using the following formula:

Student-teacher ratio = [total number of students per school/total number of teachers per school]

The mean of this ratio is shown in the table below. For instance, in 2011, there are 21 children per teacher.

Annex Table 327 PSC: Average student-teacher ratio

	2011	2016
Overall	21.4	21.6
School level		
Primary	26.4	26.6
Middle	19.9	18.8
High	19.3	18.5
Higher Secondary	19.1	17.5
Inter College	14.9	
School gender		
Male	19.9	19.4
Female	19.6	19.7
Both	21.6	21.8
School location		
Urban	19.1	18.4
Rural	22.8	23.4

Annex K Income, Expenditure and Wealth Calculations

Household surveys, such as PSLM, ASER and MICS gather information that can be useful in understanding household decisions on education. Depending on the type of available data, measurements of income, expenditure and wealth have been incorporated in the data to understand inequality in education.

K.1 Pakistan Social and Living Standards Measurement (PSLM) Survey

In the analysis of the PSLM both expenditure and income quintiles are used, depending on the data year. While the PSLM survey measures household income information, this is underreported in the data. When the PSLM is conducted in conjunction with the Household Integrated Economic Survey (HIES), expenditure quintiles are used instead. In calculating these quintiles, we have made the assumption of equal distribution within the household. Both income and expenditure are per capita monthly measurements.

K.1.1 Income quintile

In 2012/13, 2014/15, and 2018/19 income has been used as a proxy for poverty. Income from the main occupation of earning members has been aggregated at the household and annual level, and then divided by household size and 12 months. The quintiles are generated such that there is a relatively equal distribution of households in each of the five categories. The table below shows the PKR amount that corresponds to each quintiles in Punjab.

Annex Table 328 PSLM: Income quintiles and per capita cut-offs (PKR)

	2012/2013	2014/2015	2018/19
1st (poorest)	11.1 to 1166.7	12.5 to 1,229.2	11.7 to 2,000.0
2nd	1,169.6 to 1,800.0	1,230.0 to 1,875.0	2,002.4 to 2,833.3
3rd	1,802.4 to 2,571.4	1,876.0 to 2,653.8	2,834.6 to 3,861.1
4th	2,572.0 to 4,000.0	2,656.3 to 4,000.0	3,865.7 to 5,666.7
5th (richest)	4,010.4 to 550,000.0	4,006.9 to 500,000.0	5,672.7 to 300,000.0

K.1.2 Expenditure quintile

In 2013/15 and 2015/16, expenditure is used instead of income as income is underreported in the dataset. The methodology used to calculate expenditure is based on food poverty and involves aggregating food and non-food expenditure on non-durable items that last through one year. This is then divided by number of household members, assuming equal distribution within the household. It generates an average per month per adult equivalent food expenditure measurement. Expenditure quintiles are also used in the PSLM report. The quintile was generated such that there is a relatively equal distribution of households in each of the five categories. The PKR cut-offs for each year are presented below for Punjab.

Annex Table 329 PSLM: Expenditure quintiles and per capita cut-offs (PKR)

	2013/14	2015/2016
1st (poorest)	1,048.5 to 3,114.7	960.5 to 3,425.97
2nd	3,116.2 to 4,407.5	3,429.2 to 4,388.9
3rd	4,408.4 to 6,591.4	4,390.2 to 5,599.4
4th	6,592.7 to 12,709.2	5,600.6 to 7,829.9
5th (richest)	12,711.7 to 276,191.8	7,833.0 to 162,961.4

K.2 Annual Status of Education Report (ASER)

K.2.1 Wealth quintile

In the ASER dataset household wealth index quintiles have been utilized as a proxy for poverty. The survey gathers data on household indictors that include condition of the house and household assets. The wealth index has specifically been calculated using information on house type, house ownership, along with presence of electricity connection, mobile and television[72], and through principal component analysis. While each subsequent round of ASER gathers more information on household assets, the indicators used to calculate the wealth index remain constant according to the 2012 base survey[73]. The wealth index has been divided into quintiles, and households are relatively equally distributed in each category.

K.3 Multiple Indicator Cluster Survey (MICS)

K.3.1 Wealth quintile

MICS gathers extensive data on household characteristics which are used to construct a wealth index. The MICS raw data already contains a composite indicator of wealth that is also used in the RESP analysis. Information on dwelling characteristics, ownership of consumer goods, water and sanitation facilities, energy for cooking, heating and lighting, and other factors related to household wealth are used to construct this index.[74] Each household is assigned a wealth score according to the weights assigned to each of the assets through principal component analysis. In 2014 and 2017/18 further steps are taken to minimize the bias of urban households in the wealth index. Each household is ranked based on their wealth score and divided into equal quintiles. MICS uses are increasingly larger list of assets over time, as shown below:

Annex Table 330 MICS: Assets for quintiles

2011	2014	2017/18
Number of rooms for sleeping per member Material used for floor, roof and wall of dwelling Electricity Household possessions (gas, radio, television, cable	Material of the floor, roof and walls Electricity Household possessions (radio, television, mon-mobile telephone, refrigerator, gas, computer, AC, washing	Persons per sleeping room Material used for floor, roof and wall Electricity Household assets (telephone line, radio, heater, cooking range, sewing machine, iron,

[72] The wealth index will be missing if the household has missing information on any one of these variables.
[73] While ASER 2012 also gathers information on household toilet availability, this is not included in the wealth index because subsequent rounds do not collect this information.
[74] The wealth index will be missing if the household has missing information on any one of these variables.

television, mobile and non-mobile phone, computer; internet access, refrigerator, AC, washing machine, cooler, microwave, sewing machine, iron, water filter, motorised pump) Utilities owned by household members (watch; bicycle; motorcycle/scooter; animal-drawn cart; car or truck) Source of drinking water and type of sanitation facility Type of cooking fuel	machine, air cooler, cooking range, microwave, sewing machine, iron, water filter and dunky pump/turbine), Utilities owned by household members (watch, mobile telephone, bicycle, motorcycle, animal drawn-cart, bus /truck, boat with motor, car/van, tractor/trolley) Household ownership Ownership of land Having animals (cattle, milk cows, buffaloes or bulls, horses, donkeys, mules or camels, goats, sheep and chickens/ducks/turkey) Possession of bank account Main source of drinking water and type of toilet Type of fuel used for cooking	bed, sofa, cupboard, wall clock, TV, refrigerator, washing machine, air cooler/fan, microwave, water filter, dunky pump, AC) Utilities owned by household member (watch, bicycle, motorcycle, animal drawn cart, car/van/bus/truck, boat with motor, tractor, auto rickshaw) Computer/mobile/internet Land area Type of cookstove Type of energy at cookstove Type of household fuel Type of space heating Source of light Source and location of drinking water; sufficient water Type, location and sharing of sanitation facilities Availability of water at handwashing; soap Servants