REVIEW OF EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS) THAT TRACK INDIVIDUAL STUDENT DATA

TIMOR-LESTE

July 2020
Acknowledgements

Ministry of Education, Culture, Science and Sports

The Timor-Leste Ministry of Education, Youth and Sport (the Ministry) has shown a great interest in this research, illustrated by the willingness of many staff to be interviewed and to provide open responses. There is growing awareness among the interviewed Ministry staff of the potential of using more and better-quality data for decision-making. This was not only evident during interviews and small group discussions, it was also illustrated by the Vice-Minister who opened the validation workshop, who emphasised the importance of the availability of reliable data to move the education sector forward.

The time-availability and the openness of Director-Generals, National Directors, and Chiefs of Departments and other staff were instrumental in informing the analyses and formulation of recommendations. The EMIS Department itself has been an excellent facilitator of the research: not only did the staff provide highly relevant documentation, they also reflected on the development of the EMIS from a historical perspective, and were able and willing to share some critical opinions. These critical views were exceptionally valuable and are reflected in the conclusions and recommendations of the report.

The school level is where equitable access and the quality of education service delivery must be measured. So it has been exceptionally meaningful to listen to the experiences of staff working at school or municipality level. These staff should continue to inform the development of the EMIS, so that the system becomes relevant not only at the macro level, but also to individual schools.

Lastly, a word of thanks to the Ministry staff and education stakeholders who were interviewed or participated in the validation workshop. It was positive to observe how staff from the Ministry and other organisations worked together in small groups, providing valuable feedback to complete the findings and shape the recommendations. This research has been a great collaborative effort that has raised the awareness of the urgent need to develop the EMIS. This is a journey and it is hoped that this report can serve as a guide for this journey.
UNICEF

UNICEF supported this research through the efforts of the UNICEF Timor-Leste Country Office and the East Asia and the Pacific Regional Office (EAPRO). The Education Section of UNICEF Timor-Leste worked closely with the consultants, the Ministry of Education, and various partners to carry out the EMIS review, including the validation workshop.

UNICEF country offices manage and implement programmes supporting children’s rights through 14 offices in 28 countries, including 14 Pacific Island Countries throughout the East Asia and the Pacific region. UNICEF has supported various aspects of EMIS development in these countries, either directly or through collaboration. UNICEF has also supported numerous studies which either promote or use EMIS and EMIS data. For example, UNICEF has recently supported studies on out-of-school children1 in 10 countries in the region, which relied heavily on EMIS and household survey data to help identify those children and their characteristics who are at risk of dropping out, and who were out of school. The Out Of-of-School Children Initiative was a collaboration with the UNESCO Institute for Statistics (UIS) and host governments.

In Timor-Leste, UNICEF works to translate its commitment to the Convention on the Rights of the Child into practical action for the benefit of the approximately more than 600,000 children under 18 years of age who comprise nearly half of the country’s population. It works to bring basic services and opportunities to all children in Timor-Leste in health, education, and water sanitation, and to strengthen the systems that are designed to protect children and promote their rights.

At the regional level, UNICEF continues to address inequity issues in the region by facilitating and supporting regional initiatives and partnerships, such as: the Asia-Pacific Thematic Working Group on Education 2030/Sustainable Development Goal 4, which UNICEF co-chairs with UNESCO; Enhancing Statistical Capacity for Education, with UIS; the Association of Southeast Asian Nations (ASEAN) Declaration on Strengthening Out-of-School Children and Youth Working Group, with UNESCO; the East Asia and Pacific United Nations Girls’ Education Initiative, with multiple partners; the Asia-Pacific Regional Policy Forum on Early Childhood Care and Education; the Pacific Regional Forum for Early Childhood Care and Education; and the Asia-Pacific Multilingual Education Working Group. All of these initiatives rely on accurate and timely data to help inform stakeholders of disparities and other issues within education throughout the region.2

Other initiatives encourage countries to seek improved methods of obtaining quantitative data on learners and to use data to influence policy and resource allocation. An example includes the development of a regional assessment: the Southeast Asia Primary Learning Metrics,3 in collaboration with the Southeast Asian Ministers of Education Organization and the Australian Council for Educational Research, to ensure greater focus on learning (including global citizenship) in participating countries and enable the comparison of learning standards across ASEAN.

1 Including Vietnam, Philippines, Indonesia, Cambodia, Thailand, Lao People’s Democratic Republic, Malaysia, Myanmar, Papua New Guinea, and Timor-Leste.
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Definitions

**Administrative data:** All school and student data, including student management data, student learning data, school finance data, etc.

**EMIS:** An education management information system (EMIS) is a system that manages education information. In different contexts a system may be referred to by a different name. An EMIS can manage a wide range of data, including: student information (demographics, enrolment, discipline and other functional elements); instructional/learning information (assessment and achievement data, teacher evaluations, curriculum effectiveness data, and other elements related to progression through school); longitudinal data; and business intelligence (financial and human resource data, strategic metrics, etc.).

**Local:** This refers to all of the administrative subdivisions that fall under the sub-national level. For example, municipalities, counties, districts and, communes.

**Metadata:** A set of data that describes and gives information about other data.

**National:** This refers to the whole country. The national level refers to legislation mandated by the central government.

**Sub-national:** This refers to the administrative level that immediately follows the national level. For example: states in India, Mexico and the US; provinces in Argentina, Indonesia, Thailand, and Finland; regions in France; or zones in Nepal.

**Summative indicators:** Variables derived from individual-level data, such as administrative, financial, or human resources data.
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ASEAN</td>
<td>Association of South-East Asian Nations</td>
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<tr>
<td>DNPPMA</td>
<td>National Directorate of Policy, Planning, Monitoring and Evaluation</td>
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<tr>
<td>EAPRO</td>
<td>UNICEF East Asia and the Pacific Regional Office</td>
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<tr>
<td>EMIS</td>
<td>Education management information system</td>
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<td>ESA</td>
<td>Education Sector Analysis</td>
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<td>ESP</td>
<td>Education Sector Plan (2020–2024)</td>
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<td>GER</td>
<td>Gross enrolment rate</td>
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<td>ISCED</td>
<td>International Standard Classification of Education</td>
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<td>M&amp;E</td>
<td>Monitoring and evaluation</td>
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<td>MIS</td>
<td>Management information system</td>
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<td>NESP</td>
<td>National Education Strategic Plan 2011–2030</td>
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<td>NER</td>
<td>Net enrolment rate</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>OOSC</td>
<td>Out-of-school children</td>
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<td>PMIS</td>
<td>Personnel management information system</td>
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<td>SABER</td>
<td>Systems Approach for Better Education Results</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>SDP</td>
<td>Strategic Development Plan 2011–2030</td>
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<tr>
<td>UIS</td>
<td>UNESCO Institute for Statistics</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
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<td>UNICEF</td>
<td>United Nations Children's Fund</td>
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<tr>
<td>UPMA</td>
<td>Unidade de Planeamento, Monitorizacao e Avaliacao (Planning, Monitoring and Evaluation Unit)</td>
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<tr>
<td>WASH</td>
<td>Water, sanitation, and Hygiene</td>
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Review of EMIS that track individual student data: Timor-Leste
Executive summary

This review of the EMIS in Timor-Leste has examined the policy and data gaps relating to the EMIS, and has reviewed the extent to which data are analysed and utilised for decision-making by the Ministry of Education, Youth and Sport. The review examined all facets and components that are necessary to fully capitalise on the potential of the EMIS as a facilitator of data-driven decision-making.

An EMIS can be defined as a mix of operational systems and processes, increasingly supported by digital technology, that enable the collection, aggregation, analysis, and use of data and information in education, including for management and administration, planning, policy formulation, and monitoring and evaluation (M&E) (refer to Figure 1).

The review concluded that the EMIS is well managed in terms of its annual data collection cycle, and this provides a strong foundation for the necessary development of the system. The review also concluded that the EMIS is rich in individual student data, which offers great potential for the Ministry to support vulnerable groups. Examples of individual student data include the unique EMIS identification number and data on variables such as mother tongue, disability status, and work status of parents.

However, the review revealed many policy gaps and other weaknesses that are hampering the utilisation of data. Examples are the absence of a legislative framework and guiding manuals, poor dissemination of data, data quality issues, and limited use of data that goes beyond the procurement of resources and budgetary planning of school financial resources.

The current high dependency on development partners such as the United Nations Children’s Fund (UNICEF) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS) for analysis of data masks the lack of data-driven decision-making practice in the Ministry of Education, Youth and Sport. Developing the internal capacity to utilise data for decision-making is of critical importance for the Ministry, should it wish to respond to the needs of its domestic agenda, including management of schools, supporting vulnerable groups, and carrying out effective M&E.

A core conclusion of the review is that the Ministry needs to make more and better use of better-quality data, which requires in-service professional development of decision makers on how to use data for decision-making. A key recommendation is that a senior unit or data specialist should be contracted in the Ministry, who can guide the development of the EMIS and the professional development of decision makers in using data.
Another aspect hampering the EMIS is the centralised nature of data management and reporting. EMIS data are both entered and reported through the EMIS Department, which limits access and use by stakeholders at the municipal and school levels, as well as in other departments throughout the Ministry of Education, Youth and Sport. There is capacity to commence a process of decentralising data management and tailoring reports and data functions for stakeholders at the municipal level and below, to help encourage wider engagement with the EMIS and its data.

Despite several reviews, the EMIS has not seen any updates since it was developed a decade ago, due to a lack of development budget and a high dependency on costly international technical assistance. Recommendations that were generated by reviews have not been addressed, which can be partly explained by changes of government. The current political context looks favourable however, and the upcoming development of the Education Sector Plan 2020–2024 (ESP) offers a good opportunity for the Ministry of Education, Youth and Sport to develop and implement a dedicated strategy for the EMIS. The recommendations from this report and previous reviews should be used as an input to develop such a strategy and to guide the reform of the EMIS should the Ministry wish to do so. An important and urgent recommendation is that the previously mentioned unit or data specialist conduct a full requirements analysis and adopt a holistic approach to the development of the EMIS.

The following diagram summarises the procedures, systems, and frameworks that have been reviewed for this review. The diagram illustrates that development of the EMIS requires a holistic approach, addressing all aspects of the collection, analysis, and utilisation of EMIS data.

Figure 2 is followed by 10 key conclusions from the research and 21 recommendations that can inform the process of developing EMIS in the coming years.
Conclusions

1. The EMIS Department has an efficient production team that is effectively managed, if all positions are filled. It provides a strong foundation for the further development of the EMIS.

2. There is a capacity vacuum in the Ministry of Education, Youth and Sport regarding the utilisation of data, and to some extent the analysis of data. The EMIS data have great potential for decision-making; however, the Ministry does not capitalise on that potential for various reasons. The Directorate of Policy, Planning and M&E has no authority over National Directors and the Director General to enforce the use of data, and there are suspected issues regarding the accuracy of data.

3. Decision makers also have limited capacity to utilise data. Incidental training has taken place over the years, but decision makers are not structurally supported by in-service professional development interventions, training packages, or mentoring.

4. Instructions to complete forms are communicated verbally to school directors during annual training sessions. EMIS data collection and verification are not supported by guiding manuals, contributing to inaccuracies, duplications, and late submission of data.

5. The EMIS is not synchronised and aligned with other databases, such as Free Balance, and, more relevantly, the Personnel Management Information System (PMIS). Some data integration is based on inconsistent paper trails, further contributing to the inaccuracy of data and duplicated data.

6. The current EMIS, including IT equipment, was developed 10 years ago and it has not seen updates and improvements since. This is partly explained by the absence of a development budget and a high dependency on international technical assistance. The Ministry of Education, Youth and Sport has no capacity to develop the EMIS and the EMIS Department is not supported by available and affordable local IT enterprise to do so.

7. The data collection occurs at school level, mostly by teachers that are not trained or supported by guidelines. The data entry occurs at one location at central level, delaying completion of the data collection cycle and affecting the efficiency and accuracy of the paper-based verification process.

8. EMIS data are not structurally shared with national entities, municipality offices, or schools. This restricts the utilisation of data at all levels and it hampers, in particular, greater efforts are needed to help school actors to understand the importance of providing accurate, complete, and timely data. Disseminating data in a format that can be understood by its users is an important capacity development intervention that is needed.

9. The EMIS lacks a dedicated development strategy. It also lacks a legal framework that clarifies roles, responsibilities, and expectations. Schools that do not follow (undocumented) procedures can do so without consequences.

10. The current EMIS is an outdated system but it has potential. The EMIS requires a transition to become a dynamic data ecosystem that serves decision makers to plan, monitor, (including in respect of the Sustainable Development Goals (SDGs)), develop policy, procure, support vulnerable groups, and manage departments, municipality offices, and schools.

11. The EMIS has been reviewed several times since its design. The reviews resulted in reports that provided recommendations that have not been addressed to date by various governments. The upcoming development of the ESP 2020–2024 offers a good opportunity for the current government to address recommendations of this and other, complementary, reviews.

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4 Free Balance is a financial management information system that is used by the Government of Timor-Leste for the administration and monitoring of public expenditure.
The previous diagram is now used to indicate the gaps, strengths, and weaknesses of the current EMIS:

Figure 3. Status of the elements of the EMIS in Timor-Leste

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5 Various databases exist, but integration between databases has not been developed and manuals have not been developed for any systems. Hence, ratings for some aspects of the EMIS are given as black (latent). Similarly, individual data are collected but are not used for tracking individual children. This is illustrative of one of the key findings. EMIS has significant potential to be used for many other functions but the Ministry has yet to capitalise on the potential.
Consolidated recommendations

Each research question generated a number of detailed recommendations. These recommendations were reviewed by the Ministry and stakeholders at a validation workshop on 10 and 11 April 2019. The outputs of this validation workshop were used to add additional recommendations and modify some of the existing recommendations. A full description and rationalisation of the recommendations can be found in Annex J and under each research question in the report.

The table below presents consolidated recommendations, summarising and merging the detailed recommendations. The table indicates which unit should be responsible for implementation and the final column includes references to the recommendations under each research question in the report (and Annex J). The table is followed by a diagram that presents a logical sequence for implementing the recommendations.

Arguably, the most important recommendation is recommendation ‘0’, to secure high-level support to prioritise the development of the EMIS.

Table 1. Consolidated recommendations

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<tr>
<th>Category / topic</th>
<th>Step</th>
<th>Recommendation</th>
<th>Start</th>
<th>Responsible unit</th>
<th>Reference in report</th>
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<tr>
<td><strong>Enabling environment:</strong> EMIS strategy and development</td>
<td>0</td>
<td>The development of the EMIS should be aligned with the Ministry of Education, Youth and Sport’s Annual Action Planning and Education Sector Planning processes, and informed by recommendations from various reviews of the EMIS. This will facilitate a holistic approach to EMIS development and ensure the continuous support and funding of EMIS development.</td>
<td>Immediate</td>
<td>Cabinet of the Minister and Vice-Minister</td>
<td>-</td>
</tr>
<tr>
<td><strong>System, integrity, decentralisation:</strong> Online EMIS data</td>
<td>1</td>
<td>Publish a practical description of indicators and disaggregation of data as a first, minor step, to facilitate access to and use of EMIS data. Translate the EMIS website into Portuguese language and encourage use by widely sharing the URL through engaging (social) media and other media outlets.</td>
<td>Immediate</td>
<td>EMIS Department and ICT Department</td>
<td>1.13.1; 2.01.7; 2.01.3</td>
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<tr>
<td><strong>Data analysis and use:</strong> SDG indicators</td>
<td>2</td>
<td>Complete the mapping of education data to the SDG indicators (with support from the data unit (reference Recommendation 4)) so that the Ministry is able to use EMIS data to monitor global, thematic, and relevant national SDG indicators. Use the mapping to identify and resolve EMIS data gaps.</td>
<td>Immediate</td>
<td>National Directorate of Policy, Planning, Monitoring and Evaluation (DNPPMA) (supported by data analysis unit)</td>
<td>1.03.1; 1.03.2; 1.10.1</td>
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<td>Category / topic</td>
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| Enabling environment: System requirements analysis | 3    | Undertake a full requirements analysis of EMIS development which can be used to inform an EMIS strategic plan. The analysis should include:  
• a cost-effectiveness study regarding the possibility of utilising local service providers for hosting the EMIS;  
• a specification of the annual operational budget for the EMIS; and  
• an assessment of internet connectivity solutions at municipality and school levels to decentralise data entry to central basic education schools.                                                                                                           | 2019             | DNPPMA and EMIS technical assistance                 | 1.01.2; 1.11.3; 1.11.4; 2.01.4; 2.01.5 |
| Data analysis and use: Data analysis unit | 4    | Establish a senior data analysis unit in the Ministry, tasked with:  
• analysing data and facilitating data-driven monitoring and reporting by the Ministry;  
• developing in-service training packages for managers at national, municipality, and school level;  
• ensuring Ministry units use data for monitoring equitable access, implementation of action plans, informing policy development, and planning procurement.  
This unit could be an individual data specialist, based in the Minister’s Cabinet and capable of providing capacity development support to senior Ministry staff. The unit should partly substitute and expand the current data output activities conducted by the EMIS Department.  
The unit could cooperate with a local management training institution tasked with developing management training modules for using the EMIS. This may be done in conjunction with a recognised training institution, such as UNESCO’s International Institute for Educational Planning.                                                                                       | 2019             | Cabinet Minister / Vice-Minister                      | 1.02.1; 1.02.3; 1.02.4; 2.01.8; 2.07.1 |
| Enabling environment: EMIS strategy and development | 5    | Develop a strategic plan for the EMIS, to align with the (proposed) revised national ESP (2020–2024), addressing the recommendations from this and previous reviews of EMIS:  
• The EMIS strategy should distinguish between the annual operational budget and a development budget dedicated to the EMIS only;  
• The operational budget for the EMIS should include an allocation for upgrading or replacing hardware used for the EMIS, internet connectivity (if applicable), and recurrent training for staff at all levels in the access and use of the system;  
• The development budget should specify how the EMIS will change over time as innovations are undertaken, such as decentralisation of data entry. This should help engage partners and foster required funding for the EMIS.                                                                                       | 2019             | DNPPMA, EMIS technical assistance                     | 1.01.3; 1.01.4; 1.02.2; 1.12.1; 1.12.2; 1.12.3; |
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<th>Category / topic</th>
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<th>Start</th>
<th>Responsible unit</th>
<th>Reference in report</th>
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| **Enabling environment:**                              | 6    | Conduct an audit of the quality of the EMIS data to assess the extent of the data accuracy, including the formulas used to calculate indicators. The results can inform a wider review of the EMIS:  
  • by informing the development of a policy framework for quality aspects;  
  • by prioritising the collection of data that do meet quality standards; and  
  • by informing the development of guidelines and other quality assurance measures. | 2019  | EMIS Department  
  (supported by the proposed data analysis unit)                                                   | 1.04.1; 1.04.3; 1.06.1; 1.06.2:                                      |
| **System, integrity, decentralisation:**                | 7    | A survey should be undertaken of vulnerable children, including various types and severity of disabilities and socioeconomic background of parents, to assess the accuracy of EMIS data and to make recommendations to improve the accuracy of the recording of data.  
  Following the survey a review should be undertaken of the complexity and appropriateness of the methodology and consideration should be given to including the detailed responses in the EMIS for administrative review.  
  Data collectors (including teachers) should be properly trained on the collection of individual student data, in particular the use of the Washington Group module, if the data on disability are to be reliable. | 2019  | EMIS Department  
  and Department of Inclusive Education                                                                  | 1.04.2; 1.04.3; 1.04.4; 1.04.5                                   |
| **Data analysis and use:**                             | 8    | Assess annual training requirements of staff at school and municipal levels to ensure professional development needs can be regularly addressed. Similarly, EMIS data access and use should be surveyed annually at municipal, school, and public level, and changes to the distribution of hardcopy data should be adjusted based on the survey results.                                                                                                                                  | 2019  | EMIS Department                                                                                       | 1.11.2:                                             |
| **Enabling environment:**                              | 9    | The Ministry should develop and implement a policy dedicated to the strengthening of the EMIS, data quality, and the use of data by the Ministry and stakeholders, in response to the government’s programme to develop the procedures and systems for M&E.  
  The policy should be supported by a regulating framework describing compliance areas, standard operational procedures, protection of data privacy, (data) quality assurance, and legislation concerning the submission of false, misleading, or late data. | 2020  | DNPPMA, Juridiku                                                                                      | 1.01.1; 1.02.5; 1.07.1; 1.07.2; 1.07.3; 1.08.1; 1.08.2; 1.10.2 |
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<th>Responsible unit</th>
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<tr>
<td>System, integrity, decentralisation: Student attendance and achievements</td>
<td>10</td>
<td>Investigate (or pilot) whether the EMIS can collect individual student data on, for example, school attendance, learning achievements, behaviours, socioeconomic status, disability status etc., and whether it can provide an early warning for potential dropouts. Alternatively, school inspectors can monitor student attendance by conducting headcounts, the results of which can be compared with the official EMIS student enrolment numbers.</td>
<td>2020</td>
<td>EMIS Department (Supported by EMIS technical assistance)</td>
<td>2.05.1; 2.05.2</td>
</tr>
<tr>
<td>System, integrity, decentralisation: School portal</td>
<td>11</td>
<td>Develop a school portal to the EMIS which will enable schools that are able to to enter and access school data, use data for school development planning, and replace student record-keeping with electronic record-keeping.</td>
<td>2020</td>
<td>EMIS Department, ICT Department, and ICT enterprise</td>
<td>1.13.4; 2.03.3</td>
</tr>
<tr>
<td>System, integrity, decentralisation: Interface and feedback loop</td>
<td>12</td>
<td>Develop an interface (partly comprising a dashboard) so that directorates, municipality offices, and schools can access disaggregated student, teacher, and school data, enhancing data relevance for micro-level planning and real-time monitoring. The interface should present data and indicators in a format that facilitates understanding, e.g. charts and explanatory diagrams. The interface should include a feedback loop, enabling directorates to contribute to data verification, resulting in enhanced accuracy and credibility of EMIS data.</td>
<td>2020</td>
<td>EMIS Department, ICT Department, and ICT enterprise</td>
<td>1.06.4; 1.06.5; 2.01.6; 2.02.2; 2.02.3</td>
</tr>
<tr>
<td>System, integrity, decentralisation: Spot-checks</td>
<td>13</td>
<td>School inspectors should conduct spot-checks in schools to monitor compliance of schools with providing accurate data, and to help verify the accuracy of data. Issues relating to EMIS data should be recorded upon the completion of an inspection of a given school. This can help identify schools that are providing poor data and thus require additional support.</td>
<td>2020</td>
<td>EMIS Department and General Inspectorate of Education (IGED)</td>
<td>1.06.3; 2.01.2</td>
</tr>
<tr>
<td>System, integrity, decentralisation: Development of guiding manuals</td>
<td>14</td>
<td>Develop practical guiding manuals that explain the roles and responsibilities of each person involved in the data collection, submission, and verification process. Guiding manuals should comprise instructions for use of all EMIS forms, including the use of student transfer forms.</td>
<td>2020</td>
<td>EMIS Department</td>
<td>1.07.5; 2.04.1</td>
</tr>
</tbody>
</table>

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6 A good example for Timor-Leste is Malaysia’s early warning system, which is based on seven data points, including academic record, attendance, socioeconomic status, distance from school, behaviour/disciplinary record, disability status, and status of parents/guardians (e.g. divorced etc.). These indicators were selected based on the analysis contained in a study conducted under UNICEF’s OOSC Initiative on major causes for children dropping out of school, as reported in Malaysia’s EMIS study.
<table>
<thead>
<tr>
<th>Category / topic</th>
<th>Step</th>
<th>Recommendation</th>
<th>Start</th>
<th>Responsible unit</th>
<th>Reference in report</th>
</tr>
</thead>
<tbody>
<tr>
<td>System, integrity, decentralisation: Validation flags</td>
<td>15</td>
<td>Build in additional validation checks, in data collection, entry, and calculation of indicators, to prevent inaccurate data entries.</td>
<td>2020</td>
<td>EMIS / IT enterprise</td>
<td>1.06.6:</td>
</tr>
<tr>
<td>Data analysis and use: Annual dissemination of data</td>
<td>16</td>
<td>Annually share relevant EMIS data and indicators with municipality offices and schools in order to facilitate access to data. Data should be shared in a format that has meaning for school heads, administrators, teachers, and communities, including indicators and charts that can be easily interpreted and that compare performance between municipalities on key indicators. Sharing of data should coincide with a capacity development component on how to use data and indicators for decision-making, including for the preparation of annual workplans and budgets at both school and municipality levels.</td>
<td>2020</td>
<td>EMIS Department</td>
<td>1.13.2; 1.13.3; 2.01.1; 2.02.1; 2.03.1; 2.03.2</td>
</tr>
<tr>
<td>Data analysis and use: Out-of-school children (OOSC)</td>
<td>17</td>
<td>Develop tools and methodologies to identify children that are not in school, disaggregated by suko level, as a step towards schools using OOSC data as a tool to resolve barriers that are keeping children out of school and to ensure all OOSC are identified. Share relevant OOSC data and indicators with directorates, municipalities, schools, and non-formal education programmes, supported by training in the use of OOSC data for understanding the magnitude and the location of children left behind, and for planning.</td>
<td>2020</td>
<td>M&amp;E unit / data specialist</td>
<td>1.05.1; 1.05.2; 1.05.3; 1.05.4; 1.05.5</td>
</tr>
<tr>
<td>Enabling environment: Unique national coding for individuals</td>
<td>18</td>
<td>Government coding standards should be developed. Dialogue should commence between sectors on the use of a unique national code for individuals in the different sectorial databases. Ideally, a civil registry should form the basis for the unique individual code. Databases should be aligned on the coding system. Coding systems for other entities common to multiple government systems, such as institutions, assets, and regions, should be developed. This would ultimately enable the sharing of data between systems and the identification of children not accessing essential services, such as vaccination, education, and child welfare services. While such alignment may take many years, the process should be started soon.</td>
<td>2021</td>
<td>Cabinet Minister/ Vice-Minister, in coordination with relevant ministries</td>
<td>1.09.2; 1.09.3:</td>
</tr>
<tr>
<td>System, integrity, decentralisation: Database integration – PMIS</td>
<td>19</td>
<td>Integrate the PMIS database on state-paid teachers as part of the EMIS to ensure the existence of automatically aligned, consolidated data on state-paid teachers, eliminating paper-based data trails. Use recommendations from the 2015 Management Strengthening Report (World Bank) to implement this recommendation.</td>
<td>2021</td>
<td>Relevant ministries</td>
<td>1.09.1; 1.09.4; 2.04.0</td>
</tr>
<tr>
<td>Category / topic</td>
<td>Step</td>
<td>Recommendation</td>
<td>Start</td>
<td>Responsible unit</td>
<td>Reference in report</td>
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<tr>
<td>----------------------------------</td>
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<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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<td>-------------------------------------------------------</td>
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</tr>
<tr>
<td>System, integrity, decentralisation: School report card</td>
<td>20</td>
<td>Develop a school report card that is linked to school development planning. The school report card should be published on the website of the Ministry of Education, Youth and Sport annually, and should be searchable for each school. The report card can indicate progress towards national goals, such as reducing dropout and the provision of adequate facilities. There are many examples of such school report cards from many countries in and beyond the East Asia and the Pacific region, but it is important that the report cards are applicable to school planning in Timor-Leste.</td>
<td>2021</td>
<td>EMIS Department and ICT Department</td>
<td>1.13.7:</td>
</tr>
<tr>
<td>System, integrity, decentralisation: Student report card</td>
<td>21</td>
<td>Develop and pilot a student report card generated by EMIS which can be used to enable schools, which can access the EMIS directly, understand their progress towards key targets. The card should be linked to school development planning. This process should have the involvement of actors at the school level, including head teachers and members of the School Development Committee.</td>
<td>2022</td>
<td>EMIS Department and ICT Department</td>
<td>1.13.6:</td>
</tr>
</tbody>
</table>
Review of EMIS that track individual student data: Timor-Leste

- Develop a comprehensive policy and regulating framework for EMIS
- Conduct spot checks by inspectors of aspects of data quality
- Support units to Utilize OOSG data to remove barriers
- Integrate PMIS data on teachers with EMIS data
- Start developing Government coding standards (Civil registry)
- Start annual dissemination of relevant EMIS data and indicators
- Develop practical guiding manuals, clarifying all roles and responsibilities
- Develop a dedicated strategy for EMIS 2020-2024
- Conduct a full EMIS requirements analysis
- About methodological for collecting individual data
- Start collecting student achievement and school attendance data
- Complete mapping of EMIS data against SDG indicators, resolve data gaps
- Establish a senior data/capacity development unit
- Conduct an audit of data accuracy
- Annually assess and address training needs of data collectors/verification
- Develop a school portal to decentralize data entry and utilization
- Develop an EMIS interface, allowing direct access to disaggregated data and real time monitoring
- Develop a school report card, published online and publicly searchable
- Develop and pilot a digital student report card through EMIS
- Start developing Government coding standards (Civil registry)
Review of EMIS that track individual student data: Timor-Leste
1 Introduction

1.1 Purpose and scope of the research

Given the importance of quality disaggregated data on education for SDG reporting and national monitoring and systems improvement purposes, the United Nation Children's Fund's (UNICEF's) East Asia and Pacific Regional Office (EAPRO), after consultation with the United Nations Educational, Scientific and Cultural Organization (UNESCO), has assisted Timor-Leste to undertake a review of its EMIS, to help identify ways in which the EMIS can be strengthened to promote equitable quality education and learning in the region. The review has examined and assessed the status of policy and data gaps and the extent to which the EMIS is being analysed and utilised. The review has had a particular focus on systems relating to individualised student data and tracking.

It is hoped that the findings generated in the review will lead to actioned recommendations for improving the EMIS and its use by the Government of Timor-Leste and its partners, and that the findings will also help to inform UNICEF EAPRO and other development partners on how they can better support the EMIS's operation and utilisation in Timor-Leste. In the broader context, this review is being used to inform a three-country study which will make general recommendations regarding how countries can develop their EMIS. It is hoped that the findings generated in the broader study will lead to actionable recommendations for improving the EMIS and its use by governments globally, and that the findings will help partners to offer assistance in the area of EMIS development. This review has therefore involved government and partners during all phases and in the approval of the final report, to help ensure government and partners have full ownership of the findings and recommendations, which will lead to their eventual inclusion in national education policies and sector plans.

Two main review areas are investigated in this review, each having review questions which are responded to help inform conclusions and recommendations. The review questions, focusing on EMIS that track individual students at the school level, are separated into two areas:

- **Policy and data gaps** – This covers: plans to strengthen the EMIS; the coverage of national plans and SDGs in the EMIS; the coverage of equity and out-of-school children; quality, quality assurance, and data privacy; interaction with other data systems, management and position in the overall education data architecture; and resourcing and budgeting.
- **Data analysis and utilisation** – This covers: accessibility; processes of interpretation, analysis, and use; use for operations and monitoring, reporting, and planning; operation in relation to various systems; use for equitable resource distribution; and other requirements for improvements.

Responses in relation to both areas have helped inform the recommendations derived from this review. It is hoped that the findings and recommendations can help direct the Government of Timor Leste towards improved and more effective implementation of its EMIS and provide guidance for other governments intending to develop their EMIS and to enable individual child tracking systems.

1.2 Methodology

The research was conducted over three working months and was conducted by the UNICEF country office and a national consultant, with the support of an international consultant. The primary methodology of data collection and analysis was qualitative. The qualitative research was informed by a comprehensive literature review (refer to Annex A), and by interviews with key stakeholders (refer to Annex B). The research was conducted in three phases, as shown in the diagram below. In practice, Phase 1 (desk review) and Phase 2 (key informant interviews) were conducted concurrently to ensure a continuous process of information triangulation and validation. Phase
3 involved a workshop with key stakeholders, to be able to discuss and validate the findings and finalise recommendations. A specialist from UIS in Bangkok also participated in the workshop and served as a key resource person.

Figure 5. Phases of the EMIS research

- **Preparation phase**
  - Desk review
  - Evaluation Methodology and tools
  - Data collection schedule
  - Inception report

- **Field phase**
  - Data collection
  - Preliminary analysis

- **Reporting phase**
  - Triangulation of data and analysis
  - Draft report preparation and solicitation of stakeholder comments
  - Submission of final report

Figure 6. SABER EMIS thematic areas of analysis

- **Policy Goals**
  - **Enabling Environment**
    - Policy Levers: legal framework, organizational structure and institutionalized processes, human resources, infrastructural capacity, budget, data-driven culture
  - **System Soundness**
    - Policy Levers: data architecture, data coverage, data analytics, dynamic system, serviceability
  - **Quality Data**
    - Policy Levers: methodological soundness, accuracy and reliability, integrity, periodicity and timeliness
  - **Utilization for Decision Making**
    - Policy Levers: openness to EMIS users, operational use, accessibility, effectiveness in disseminating findings

Source: Saber EMIS Framework Paper, World Bank

Key informant interviews were informed by the research questions, as well as by the World Bank Systems Approach for Better Education Results (SABER) EMIS methodology and tools commonly used in EMIS evaluations and UNESCO’s Data Quality Assessment Framework.

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7 The SABER EMIS methodology utilises a structured evaluation process to provide education systems analyses, assessments, diagnoses, and opportunities for dialogue. At the global level, it improves the education system’s knowledge base and uses this information to implement effective reforms. [http://saber.worldbank.org/index.cfm?index=8&pd=2&sub=4](http://saber.worldbank.org/index.cfm?index=8&pd=2&sub=4) [Accessed 27 March 2019].


1.3 EMIS in the global context

An EMIS can be defined as the ensemble of operational systems and processes, increasingly supported by digital technology, that enable the collection, aggregation, analysis, and use of data and information in education, including for management and administration, planning, policy formulation, and M&E. This definition insists on the systemic nature of an EMIS — a fact which is often overlooked in efforts to reinforce government information systems.¹⁰

A comprehensive EMIS is defined as one that not only includes administrative and pupil data, but also financial, human resources, and learning data, as well as data on graduates post-study. This information should be available both at the individual and aggregate level, and be used for policy analysis and formulation, planning, monitoring, and management at all levels of an education system.¹¹ It is a system made up of people, technology, models, methods, processes, procedures, rules, and regulations that function together to provide education leaders, decision makers, and managers at all levels with a comprehensive, integrated set of relevant, reliable, unambiguous, and timely data and information to support them in the completion of their responsibilities.¹²

Figure 7. Elements of an EMIS covering all sub-sectors of the education sector

The type of data entered into the system needs to follow a logic and a defined methodology, and have a well-defined purpose. A successful EMIS is credible, operational in planning and policy dialogue, as well as in teaching and learning. It produces and monitors education statistics within an education system and has a multifaceted structure, comprising the technological and institutional arrangements for collecting, processing, and disseminating data.¹³ It is crucial for tracking changes, ensuring data quality, and timely reporting of information, and facilitating the utilisation of information in decision-making.

A management information system (MIS) is designed to assist managerial and professional workers by processing and disseminating vast amounts of information to managers organisation-wide. An MIS provides information for the management activities carried out within an organisation. The information is selected and presented in a form that is suitable for managerial decision-making and for the planning and monitoring of the organisation’s activities. An MIS in the education sector (EMIS) can be used to support education managers to make strategic, tactical, and operational decisions.

An EMIS can help provide accurate, comprehensive, and timely data collection, which can promote more rational and effective education policymaking. This can result in improved decision-making regarding: the volume and allocation of public financing, the best way to reach children most in need (due to socioeconomic circumstances, special needs, etc), staff recruitment and training, and quality and adherence to standards.

### 1.4 The Sustainable Development Agenda and the expanded vision of EMIS

The post-2015 Sustainable Development Agenda marks a substantial shift from the preceding Millennium Development Era. This is also true for the overall Education agenda. The main focus for the education sector under the Millennium Development Goals (MDGs) was on ensuring access, participation and completion of primary education as well as achieving gender parity in primary, secondary and tertiary education. In contrast to this, the three main focus areas for the education sector under the Sustainable Development Goals (SDGs) are measurement of learning outcomes, improved measurement of equity in education and a focus on lifelong and alternative means of learning. The explicit focus on equity in education implies that in addition to reporting national averages, the selected education indicators should also be reported across different sections of the population, such as wealth, religion, gender, ethnicity, and disability status amongst others. EMIS should be dynamic to enable the monitoring of groups often overlooked in administrative systems such as street children, refugees, stateless children and children of migrant workers.

The indicators measuring progress towards the education goals specified in the SDGs are reported at four different levels: the global, thematic, regional and national. Given the priorities stated in the SDG, as well as the multiple levels of monitoring and evaluation, it is necessary to invest in better data and M&E systems. Currently there are two main issues with data globally. Firstly, there is not enough high-quality data available and secondly, much of the data that is produced is either not used or is not in a format/state that allows it to be used.

Many countries are adopting the ‘expanded vision of education’ which incorporates the vision encapsulated in Sustainable Development Goal 4 (SDG 4) for ‘Quality education and lifelong learning opportunities for all are central to ensuring a full and productive life to all individuals and to the realization of sustainable development’.

It is therefore important that EMIS manage information on all sub-sectors of education ranging from early

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16 UIS (2016), sustainable Development Data Digest, Laying the Foundation to Measure Sustainable Development Goal 4, (UIS UNESCO, 2016)
17 Ibid..
18 Such as Non-Formal Education and Technical and Vocational Education and Training.
20 Sustainable Development Solutions Network (SDSN), Indicators and a Monitoring Framework for the Sustainable Development Goals Launching a data revolution for the SDGs, IA report by the Leadership Council of the SDSN Revised working draft (Version 6), February 18, 2015
childhood education, vocational education and non-formal education. Detailed information should be accessible to enable predictions concerning the potential workforce and to ensure that all people have access to education at any age. This places an increasing requirement on EMIS to be able to track an individual’s progress through the whole education system and emphasizes the need for systems to be able to report on data longitudinally. The resulting design of EMIS is likely to be more complex and more integrated in terms of sub-sector data.

The drive to achieve global targets and participate in education in global initiatives such as the International Standard Classification of Education (ISCED) has helped enforce SDG 4 as an international standard. SDG 4 has influenced both the structure of plans, the use of key concepts and targets and goals by which a plan is measured. Global goals and targets help illustrate how far from a global target a country is, and national indicator standards, to provide a frame of reference for progress at the country level. This places increasing requirements on EMIS to be developed to respond to local planning, budgeting, monitoring, evaluation and administrative needs whilst at the same time conforming to international standards so as to enable comparison of data obtained through the EMIS with other regions and countries through globally recognized education indicators. EMIS should conform with international standards for data and education indicators such as internationally recognized definitions of indicators,\textsuperscript{23} the education data standards of ISCED\textsuperscript{24} and the requirement to monitor core SDG4 indicators.

Emerging evidence shows that large numbers of children are in school, but are not learning (ACER 2016), despite considerable investment on school infrastructure, training teachers, and learning materials. The new Sustainable Development Goal (SDG) 4, presents huge opportunities to meet this challenge through a strategic shift towards equitable quality education for all. This shift is essential. There has already been substantial work undertaken in determining how SDG 4 can be measured and which countries are prepared and able to effectively monitor against indicators required as part of SDG 4.\textsuperscript{25}

There is also greater recognition that a complex interplay of socioeconomic factors influences learning outcomes. These include (but are not limited to): individual and family characteristics of students, such as gender, age, and language spoken at home; pre-school attendance; activities prior to attending school; out-of-school tuition; parental literacy; local governance; school management; community engagement; and social accountability. In addition, the type of school, the location of the school, and the resourcing available to the school that the student attends also contributes to child learning outcomes.\textsuperscript{26} Also important to the broader scope of child learning is information concerning child nutrition, clean water, and sanitation.\textsuperscript{27}

The Sustainable Development Agenda has also focused on the need to view social development holistically. For example, many countries are now starting to monitor early childhood development, which includes indicators derived from child protection, health, education, water and sanitation, and other sectors.\textsuperscript{28} This emphasises the need for a coordinated and rationalised approach to data and it also emphasises inter-sectorial coordination and cooperation. Schools can play a focal role in supporting services for other ministries,\textsuperscript{29} and also in reporting on key indicators relevant to other ministries.\textsuperscript{30}


\textsuperscript{24} The International Standard Classification of Education (ISCED) belongs to the United Nations International Family of Economic and Social Classifications, which are applied in statistics worldwide with the purpose of assembling, compiling and analysing cross-nationally comparable data. ISCED is the reference classification for organizing education programmes and related qualifications by education levels and fields. ISCED is a product of international agreement and adopted formally by the General Conference of UNESCO Member States

\textsuperscript{25} UNESCO UIS, Country readiness to monitor SDG 4 education targets Regional survey for the Arab States, (UNESCO Institute for Statistics, 2016)

\textsuperscript{26} UNESCO UIS, Country readiness to monitor SDG 4 education targets Regional survey for the Asia and Pacific region, (UNESCO Institute for Statistics, 2016)


\textsuperscript{29} Ibid.

\textsuperscript{28} Examples include Chile, Belize, and Uganda. UNICEF (2017a, 2017b) has developed a framework of early childhood development indicators derived from SDG indicators and other research to help guide and focus countries on the monitoring of early childhood development.

\textsuperscript{29} Examples include reporting deworming and vaccination programmes to the ministry of health and reporting incidence of violence against children to authorities monitoring child protection.

\textsuperscript{30} For example, reporting the quality and source of water supplies in schools to the ministry of water and sanitation.
Therefore, in order to properly monitor child learning and address the barriers preventing effective child learning, analysis of detailed information concerning the child and their family, the learning environment, as well as the national and regional socioeconomic factors, is required. According to the OECD, better data can help reduce inequity in education (including early childhood education) in multiple ways, including:

- identifying and providing systematic help to children at risk of not meeting academic and social goals;
- directing resources to the schools, students, and teachers with the greatest needs; and
- setting concrete targets for more equity in education, not only in access but also in quality and learning outcomes.

These requirements are placing increasing demands on systems to track individual children as they progress through the education system. Systems should enable disaggregation of data to allow for the analysis of complex socioeconomic factors affecting a child’s progress through the education system or exclusion from it.

UIS recently reported the availability of global and thematic indicators across all countries reporting in the UIS database in 2017. They noted that 10 of the 43 indicators are unavailable in all countries, while eight global indicators and 11 thematic indicators are reported in 50% or fewer countries. Only one global indicator and six other thematic indicators have more than 75% coverage. UIS concluded that countries are struggling to report, and in many cases even to collect, the data needed for calculating key indicators for the follow-up and review of SDG 4.

1.5 Overview of Timor-Leste

Timor-Leste is a relatively young nation that restored its independence on 20 May 2002, after 500 years of colonial rule by Portugal, followed by 24 years of occupation by the Republic of Indonesia. During the uprising in 1999, which led to restored independence in 2002, much of the country’s infrastructure, including schools, was destroyed.

Despite a short uprising in 2006, the country is now considered peaceful, politically stable, and democratic. Since the restoration of independence in 2002, Timor-Leste has seen eight constitutional governments, the current one was formed on 22 June 2018.

The country comprises 12 municipalities, including the capital Dili, plus the enclave of Oecusse, which is a semi-independent region surrounded by Indonesian’s West Timor and the Savu Sea. The main religion of the Timorese population is Catholicism and the official, national languages are Portuguese and Tetum. In addition to these two languages, multiple languages are spoken as a mother tongue. Indonesian and English are not official languages but are considered to be working languages.

Timor-Leste is a lower middle-income country with a population of 1.2 million people. Despite this classification by the World Bank, Timor-Leste falls into the category of least developed countries according to the United Nations. Agriculture is the primary source of household income for the majority of the population, while the main source of national income is derived from oil revenues.

Timor-Leste is one of the world’s poorest countries, with a GDP per capita estimated at $2,279.25 (2017). In 2011 it was ranked 147 out of 187 countries in the UN’s Human Development Index. Timor-Leste is young, with 62% of the population under the age of 25. The unemployment rate among the youth is high, putting high pressure on the economy and the social services of the country, including education service delivery.

1.6 Overview of the education system

The education system offers formal education services at pre-school education level, basic (primary and lower secondary) education level, higher secondary education level (including technical vocational education), and tertiary education level. The education system is organised as follows:

Table 2. The education system of Timor-Leste

<table>
<thead>
<tr>
<th>Education level</th>
<th>Duration / grade</th>
<th>Age group</th>
<th>Enrolment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school education</td>
<td>Two years</td>
<td>3–5 years</td>
<td>Non-compulsory</td>
</tr>
<tr>
<td>Basic education, cycle 1</td>
<td>Grades 1–4</td>
<td>6–9 years</td>
<td>Compulsory</td>
</tr>
<tr>
<td>Basic education, cycle 2</td>
<td>Grades 5–6</td>
<td>10–11 years</td>
<td></td>
</tr>
<tr>
<td>Basic education, cycle 3</td>
<td>Grades 7–9</td>
<td>12–14 years</td>
<td></td>
</tr>
<tr>
<td>Secondary education</td>
<td>Grades 10–12</td>
<td>15–17 years</td>
<td>Non-compulsory</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>-</td>
<td>18–22 years</td>
<td>Non-compulsory</td>
</tr>
</tbody>
</table>

Formal education services are delivered through a total of 1,426 public schools and 385 private schools. The total number of 1,811 schools includes pre-schools, basic education schools, and secondary education schools, and it excludes tertiary education institutions.

Basic education schools are organised into a total of 217 clusters, each cluster comprising a basic education central school and several filial schools in the proximity of the central school. Each cluster is headed by a school director and the filial schools are led by school coordinators. Secondary education schools are not clustered and have their own management structure. Pre-schools are led by pre-school coordinators, which is not an official position. The first line of reporting for pre-schools is the Municipality Education Office that is installed in each municipality.

38 Source: the National Education Strategic Plan (NESP) 2011–2030.
39 EMIS 2018
40 The Eighth Constitutional Government has responsibility for implementation, coordination, and policy evaluation in the areas of education and qualification at all levels of education, excluding higher education.
41 Journal de Republica (2019).
Since independence in 2002, the education sector has seen a rapid growth in terms of enrolment. In recent years the net enrolment rate (NER) declined for the first cycle of basic education (Grades 1–4), whereas the NER continued to grow in other sub-sectors.

Table 3. NERs in 2011, 2017, and 2018

<table>
<thead>
<tr>
<th>Level</th>
<th>NER 2011</th>
<th>NER 2017</th>
<th>NER 2018</th>
<th>School-age population*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-school</td>
<td>N.A.</td>
<td>20.3%</td>
<td>20.4%</td>
<td>91,539</td>
</tr>
<tr>
<td>Cycle 1 – Grades 1–4</td>
<td>94.9%</td>
<td>86.8%</td>
<td>82.69%</td>
<td>188,035</td>
</tr>
<tr>
<td>Cycle 2 – Grades 5–6</td>
<td>31.3%</td>
<td>50.2%</td>
<td>54.73%</td>
<td></td>
</tr>
<tr>
<td>Cycle 3 – Grades 7–9</td>
<td>32.7%</td>
<td>50.4%</td>
<td>53.13%</td>
<td>92,931</td>
</tr>
<tr>
<td>Secondary education, Grades 10–12</td>
<td>22.4%</td>
<td>35.0%</td>
<td>38.19%</td>
<td>86,509</td>
</tr>
</tbody>
</table>

*Estimated population based on 2015 census data

A major challenge for the education sector is improving the poor quality of education, the causes of which are partly explained by the historical context: when Indonesia ended the occupation, many of the Indonesian teachers that were installed by the Indonesian Government left the country. The sudden teacher supply crisis resulted in the recruitment of a large teacher workforce that did not have a formal teaching qualification. This, in turn, raised the expectation among the Timorese that unqualified volunteering teaching would sooner or later result in a state-paid position.

The recruitment of non-qualified teachers eventually led to the rapid Bacherelato programme. This programme helped unqualified teachers to accelerate pre-service training in order to acquire the Bacherelato, which is the minimum qualification needed to teach at Grades 1 to 9 and is required to enter the Teaching. Although the intervention resulted in more teachers meeting the minimum legal requirements to be a teacher, it was a challenge for the Ministry and its training institute to ensure high-quality teacher training.

Timor-Leste still has a substantial number of untrained, non-state-paid ‘teachers’ that work in schools and that are seeking a state-paid contract. In some instances, state-paid teachers ‘delegate’ their duties to these volunteers, further affecting the quality of education service delivery.

Through various programmes the Ministry of Education, Youth and Sport seeks to enhance the quality of the education service delivery. The programmes include (but are not limited to) in-service teacher training, in-classroom mentoring of teachers by school directors and deputies, classroom observations by pre-school inspectors, and the use of modern IT solutions to expose teachers to audio-visual content about good practice.

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42 Source: www.moe.gov.tl/?q=node/217 (EMIS website).
43 The National Education Act sets the minimum qualification of a Bacherelato to teach at Grades 1 to 9 level and a Licenciatura for Grades 10 to 12. A Bacherelato is obtained by completing three years of higher education. A Licenciatura is obtained by completing four years of higher education.
1.7 Overview of legislative and policy framework for education

The educational rights of the citizens of Timor-Leste are guaranteed by the Constitution (dated 22 March 2002). Section 59 stipulates that every citizen has the right to education and that the state promotes the establishment of a public system of universal and compulsory basic education that is free of charge. The Constitution also states that the state shall recognise and supervise private and cooperative education. The Constitution entered into force on Independence Day, 20 May 2002. The base Law of Education (2008) encapsulates the mandates laid out in the Constitution and provides for a general, legal framework of reference for the organisation and regulation of the educational system. The Law emphasises that all citizens have equal opportunities to enjoy education and professional training.

Article 22 of Decree Law 14/2018 of 17 August 2018 approved the Organic Law of the Seventh Constitutional Government. The Organic Law directs that the Ministry of Education, Youth and Sport is the government department responsible for design, implementation, coordination, and policy evaluation in the areas of education and qualification for all levels of education, excluding higher education. The Decree Law also provides for the vision of making the Ministry’s use of IT more efficient. Lastly, the decree provides for the approval of a revised organic structure for the Ministry. The new organisational structure that is to take shape in 2019 is shown in Annex C. Under the new structure, Municipality Education Offices are deconcentrated. However, the Government commenced a decentralisation process whereby some of the education functions have been decentralised to the municipality administrations, including the management of budgets and increased autonomy in relation to local expenditures.

Education is defined as a principal area of reform in the country’s Strategic Development Plan 2011–2030 (SDP). The National Education Strategic Plan 2011–2030 (NESP) expands on the commitments made in the SDP and enacts the Education Law through educational policies, and guides the implementation of education reform. The NESP is aligned with the Millennium Development Goals and recognises the importance of equity in education. It also recognises the importance of improving the quality of education in Timor-Leste.

The Prime Minister’s Office has requested the Ministry of Education, Youth and Sport to develop a five-year strategic plan (2019–2024). The five-year plan envisages procurement, monitoring of student enrolment, infrastructure planning, and teacher training. This is a government plan developed in response to the SDG roadmap and the education programme of the Eighth Constitutional Government.

An Education Sector Analysis (ESA) was undertaken in 2017–2018, with funding support from the Global Partnership Education, with the World Bank as Grant Agent and UNICEF as the Coordinating Agency. The objective of the ESA was ‘to provide analyses to enable updating of the National Education Strategic Plan 2011–2030’. The ESA report does not explicitly refer to the EMIS in terms of the need for it to be reviewed – it somewhat assumes the functionality of the EMIS and uses EMIS data as an input for the sector analyses.

The ESA will be used to inform a review of the NESP and to plan the allocation of a loan to the Ministry of Education, Youth and Sport that will be used to implement a reviewed strategic plan for Education.

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46 The SDP is a comprehensive national plan that describes Timor-Leste’s development goals and aspirations. The goals are aligned with the Millennium Development Goals, the predecessor of the SDGs.
1.8 Timor-Leste and the SDGs

The Government of Timor-Leste adopted the 2030 Agenda for Sustainable Development in 2015, the year during which the SDGs were also adopted by the United Nations. The roadmap for implementation of the 2030 Agenda, developed by the Ministry of Education Timor-Leste, describes how Timor-Leste seeks to achieve sustainable development. The document aligns the SDGs with the goals of the SDP, and it describes the systems, policies, and institutional structures that are needed to move sustainable progress forward. The SDG roadmap emphasises the importance of equity in regard to ‘leaving no one behind’ and ‘reaching the furthest behind first’. It highlights the importance for line ministries to collect disaggregated data in order to monitor equity.

An SDG Working Group was established in 2015, tasked with harmonising the SDGs with the goals of the SDP. Line ministries are represented as members of the Working Group, which is chaired by the Prime Minister’s Office. The Working Group mapped the SDGs to the goals of the SDP and concluded that SDGs 1 to 15 (including SDG 4 on education) are coherent with the goals of the SDP.

The Ministry of Education, Youth and Sport, with support from UIS, is in the process of mapping the SDG education indicators against available data sources in Timor-Leste. The high-level map is shown in Annex E. Data concerning four of the education indicators are obtained using EMIS data, which include SDG 4.4.2, 4.5.1, 4.a.1, 4.b.1, and 4.c.1. The 43 education thematic indicators have not all been mapped to the EMIS yet; however, this process was continuing as at April 2019, in conjunction with UIS.

Timor-Leste is reported to have 56% of the indicators for SDG 4. Critical data that are missing relate to learning outcomes and quality of teaching (4.1.1), explained by the lack of internationally comparable learning assessments. In addition, there is little official administrative data on qualified teachers (4.c.1), and more data are required from the EMIS regarding the quality of Water, Sanitation, and Hygiene (WASH) in schools.

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51 Education is under SDG 4
52 4.2.2: Participation rate in organized learning (one year before the official primary entry age), by sex.
4.5.1: Parity indices (female/male, rural/urban, bottom/top wealth quintile, disability, indigenous, etc.) for all education indicators on this list that can be disaggregated. (Parity index: The indicator value of the likely more disadvantaged group divided by the indicator value of the other sub-population of interest (p. 33)).
4.a.1: Proportion of schools with access to electricity, internet, computers, infrastructure for disabilities, drinking water, single-sex sanitation, hand-washing.
4.b.1: Volume of official development assistance flows for scholarships by sector and type of study.
4.c.1: Proportion of teachers in pre-primary, first, lower-second, and upper-second who have received at least the minimum organised teacher training pre-service or in-service required for teaching in a country, by sex.
54 Source: C. Porter, email referenced on 12 April 2019.
1.9 EMIS in Timor-Leste

1.9.1 History of EMIS in the country

Development of the EMIS in Timor-Leste commenced in 2003, following the establishment of the Ministry of Education, Youth and Sport in 2002. Prior to 2003 it is likely that paper forms and Excel spreadsheets were used to record data; however, institutional memory on the situation prior to 2003 is not reliable. The reconstructed timeline of EMIS development in Timor-Leste is shown in the diagram below.

The main events include the following:

2003–2007 In 2003 the Ministry of Education, Youth and Sports commenced recording data on basic education, using Microsoft Access. In 2007 the database was expanded by collecting and storing education data for pre-secondary education.

2008–2013 A technical advisor, contracted by the World Bank, started the design of a new EMIS, with support from the Education Sector Support Programme (Fast Track Initiative). An SQL server was installed to locally host data and Microsoft ASP.NET was used to develop web-based data collection.

Standard operation procedures were developed for data collection and verification, and some quality assurance processes were put in place. All existing forms were reviewed and school principals and EMIS focal points participated in training to understand the system, the standard operation procedures and the questionnaires for EMIS. Previous data from 2008 were migrated to the new server. Data before 2008 were discarded, given the many issues affecting them.

Until 2010 data for non-formal education were collected with support from UNICEF. From 2010, data on non-formal education were no longer collected for the EMIS.

The technical advisor left the EMIS Department in early 2012, leaving behind a functioning system that could be self-managed by the EMIS Department in terms of data collection, data entry, and verification. At this time data collection covered the three cycles of basic education, and secondary education, and from 2011 it covered second chance education, including non-formal education. Data collection on non-formal education ended in 2013.
From 2008 until the present, UIS has supported the Ministry through various activities, including a situation analysis, the development of a school questionnaire, and training of some EMIS staff – and, more recently, support with mapping of EMIS data to global and thematic SDG indicators.

From 2009 until 2013, UNICEF supported the development, graphic design and publication of the Statistical Yearbook. The books include detailed statistical data on the education sector and key indicators. The Statistical Yearbook was published for five consecutive years.

2014

After the support from UNICEF to develop the Statistical Yearbook came to an end, the EMIS Department itself produced and published two Education Data Books, in 2014 and 2015. The books are the equivalent of the Statistical Yearbook and were published on the website of the Ministry of Education, Youth and Sport. UNICEF provided some technical support to verify the calculation of indicators. Since 2016, the EMIS Department has not published additional data books.

A consultant was hired in 2014, with support from UNICEF, to create an EMIS database for pre-school education. The consultant developed parallel software so that pre-school education data were stored separately from data for other levels of education. Consequently, pre-school students that progress to basic education must be recorded as new students.

In the same year, UNICEF contracted a consultant to support a situation assessment of the EMIS. The assessment included a review of the structure of the EMIS, the EMIS questionnaires, the data input and outputs, the facilities of the EMIS Department, and the capacity of the human resources. This assessment resulted in a number of recommendations. These recommendations have not yet been addressed.

2016

In 2016 the EMIS Department designed an annual school form that collects data on a range of areas, including the state of infrastructure, school facilities, health, and sanitation. As the SQL server could not be modified by EMIS staff, the Department created this database in Microsoft Access in order to record data.

2018

The consultants that had developed the SQL server returned in December 2018, following a request from the Ministry of Education, Youth and Sport to the World Bank. The consultants were assigned to review the hardware and software, to remove duplicated students, to review the pre-school education database, and to assess how pre-school education data can be migrated to the core database. The consultants drafted a report which is under review by the Ministry at the time of writing of the present report.

2019

As at 1 January 2019, contracts of all temporary Ministry staff ended, in order to review functions and contracting of new (or previous) staff through a merit-based recruitment process. This decision has had direct consequences for the EMIS Department: 20 out of 27 staff are no longer working in the Department.

1.9.2 Legal and policy framework for the EMIS

Article 44 of the Base Law for Education supports the collection, reporting, and use of education statistics, stating that ‘Educational statistics are fundamental instruments for forming educational policies and for planning and evaluating the educational system, and should be organized so as to guarantee their realization at an opportune time and in a universal manner.’

The NESP refers extensively to the EMIS, both as a source of data for monitoring of the NESP initiatives under each component, but also as a focus for development. The NESP refers to development of the EMIS in a number of sections throughout the document but the main section for EMIS development is detailed under Priority Programme 11, which sets out the main areas for reform of the EMIS. These include the following:

55  www.moe.gov.tl/pdf/LeiBaseEducacao.pdf (Portuguese)
a) The EMIS will comprehensively integrate all internal databases (education sub-sectors, human resources, teacher training, infrastructure, financial) and all relevant external databases, such as census, population relocation, poverty, national infrastructure development, and PMIS.

b) The EMIS will be geographically oriented so as to ‘see’ the information on maps, to assist micro-planning exercises.

c) The EMIS will be accessible and interactive, with all information accessible through one single interface.

d) The EMIS will be easy to use and customisable so any user can format what he or she wants to see at any time.

e) The EMIS will be expanded to include pre-school, secondary, recurrent, and higher education.

The NESP recognises many of the shortcomings in the EMIS as it was in 2011. However, one of the issues with the NESP having a duration of almost 20 years is that it rapidly falls out of date. Therefore, the information contained in the NESP concerning the EMIS is no longer valid and has been revised in later assessments.

Since the NESP was published, no specific policies or strategies have been developed in support of the EMIS or ICT. There are no manuals in support of the data collection cycle. The data collection forms themselves include some guidance for enumerators.

1.10 EMIS organisational structure and institutionalised processes

1.10.1 Overview of EMIS organisational structure and institutionalised processes

The proposed organisational structure under the Eighth Constitutional Governments directs that the EMIS Department is managed by the National Directorate of Planning and Inclusive Education. Until the structure is fully implemented, the EMIS Department is managed by DNPPMA.

Table 4. Staffing for the EMIS Department at each level of government

<table>
<thead>
<tr>
<th>Level</th>
<th>Permanent</th>
<th>Contractors</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>8</td>
<td>16</td>
<td>One Chief of Department, two supervisors, 21 data entry staff (of which five with a permanent contract)</td>
</tr>
<tr>
<td>Municipality</td>
<td>13</td>
<td>4</td>
<td>EMIS officials, overseeing data collection and verification</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

As noted, as at 1 January 2019 all contracts of temporary staff ended. Instead of 21 data entry staff, the EMIS Department now has five staff left to support data entry.

There is no EMIS focal point assigned at the school level. School directors and coordinators are assigned to oversee the data collection and verification in schools.

1.10.2 Institutionalised processes

The EMIS currently collects data in the sub-sectors of pre-school education, basic education, and secondary education. The different phases of the data cycle are similar for each sub-sector.

National Directorates of each sub-sector and Ministry of Education, Youth and Sport stakeholders are not consulted when making changes to the various forms prior to the collection of data. In fact, forms have not been reviewed since 2011, other than minor updates. The main reason being that the EMIS Department lacks the capacity to make changes to the SQL server database.
The data cycle comprises six core phases, as shown in the figure below:

**Figure 10. Phases of the data cycle**

1. **Review/ printing of forms**
2. **Training**
3. **Collection**
4. **Data entry**
5. **Tabulation**
6. **Verification**

The first three phases of review/printing, training, and collection of data are implemented as summarised in the figure below:

**Figure 11. Printing, training, and data collection**

1.10.3 Distribution of forms, training, and data collection

Following printing, national EMIS staff visit each municipality to give refresher training on the data collection. Participants of the training include the EMIS official from each municipality, and all school directors and coordinators from pre-schools, basic education schools, and secondary education schools. Following training, the school leaders bring the forms to their schools and instruct school administration staff and teachers on how to complete the forms.

The data collection starts and the school directors (and coordinators of pre-schools) check if all forms are completed before they are submitted to the EMIS official. In turn, the EMIS official makes sure all forms are completed, sorts the forms by school, and submits the packages to the EMIS Department. The EMIS Department then enters the data manually.

The second three phases of the data cycle are summarised in the diagram below.
When entering data, the SQL server flags suspected issues, such as duplicates. This happens if names and dates of birth appear to be the same for two students. Data entry staff are then instructed to compare the names of parents to assess if there is indeed a duplicate. If confirmed, the latest data entry of this student is kept and the older data entry is deleted from the server.

Other issues that emerge during data entry, such as missing data or unreadable forms, are reported to the data entry supervisors, who describe the issue on the respective forms for later action. After completion of the data entry, forms with suspected issues are printed and submitted to the EMIS official, who, in turn, ensures all schools receive the data for verification. School staff check the data and submit verified forms to the EMIS official. The EMIS official checks all forms and submits verified data to the EMIS Department, which further cleans the data.

After completion of verification and cleaning of the database, the Chief of the EMIS Department calculates the indicators, such as the NER and students who have dropped out, and publishes tabulations on the website of the Ministry of Education, Youth and Sport.

EMIS data are not disseminated in other ways, such as in hardcopy reports or softcopies.

### 1.11 EMIS funding

As noted, the EMIS Department is currently being managed by DNPPMA, until the new organisational structure is implemented. If all positions are filled, then the EMIS Department has a total of 31 staff working at the national and municipality offices (see Table 4). Staff salaries for all sanctioned positions are paid through the Ministry of Education Youth and Sport budget for goods and services.

The EMIS Department has no specified budget. Its operational budgets for goods and services is part of the overall budget of DNPPMA. Currently, the EMIS Department operates without financial support from external agencies.

Under the sub-programme *Institutional Management*, in 2019 $55,953\textsuperscript{57} was allocated to cover the costs of four items: quarterly monitoring reports submitted on time, which can provide evidence for planning; annual educational data report is finalised; annual review is conducted; and annual report endorsed. The budget does not further specify how this budget is divided or specified. There is no budget allocated to fund a development budget or technical support. In previous years, apart from 2018, during which the previous government did not pass the budget, the available budget was used predominantly to facilitate training in municipalities.

\textsuperscript{57} Under budget item 5100205: Planning, monitoring, evaluation, and statistics
1.12 Data collection and completeness in each sub-sector

The hardware and operating systems used for the EMIS are indicated in Annex F.

The collection process is cascaded from the central Ministry of Education, Youth and Sport down to municipality offices of education, to schools, including filial schools and pre-schools. There are 1,812 schools\(^{58}\) which means the same number of staff are responsible for the collection of individual student data. Considering that much of the data collection is in practice delegated to teachers, the real number of data collectors is much higher. Many of them have not attended any training\(^{59}\) and do not have access to manuals to support data completion or quality assurance. Data collectors often rely on school management officials (coordinators/directors or the deputy) who have attended training in municipality offices.

After all forms are completed, school directors check the forms, mostly for completeness rather than accuracy of responses. The following table shows the data collection cycle for each sub-sector of the education system. As noted, data are complete for the pre-primary to secondary sub-sectors but there are presently no centralised statistical data for the higher education, technical and vocational education and training, or non-formal education sub-sectors.

Table 5. Features and coverage of data collection

<table>
<thead>
<tr>
<th>Sub-sector</th>
<th>Standard data collection form?</th>
<th>Frequency of data collection</th>
<th>How are forms distributed?</th>
<th>How are the data transferred from the decentralised units to the centre?</th>
<th>Extent of coverage: public schools</th>
<th>Extent of coverage: private schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-primary</td>
<td>Yes</td>
<td>Once per year</td>
<td>Centralised</td>
<td>Field mission by central officers</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Basic education</td>
<td>Yes</td>
<td>Once per year</td>
<td>Centralised</td>
<td>Field mission by central officers</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Secondary</td>
<td>Yes</td>
<td>Once per year</td>
<td>Centralised</td>
<td>Field mission by central officers</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Higher education</td>
<td>No</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Tech/Voc. training</td>
<td>No</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Non-form. Education</td>
<td>No</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

\(^{58}\) EMIS 2018

\(^{59}\) As evidenced in interviews conducted with school staff on 20 March 2019.
The EMIS Department collects data using the following forms:

### Table 6. EMIS questionnaires, key data, and periodicity

<table>
<thead>
<tr>
<th>Form</th>
<th>Data collected by the form</th>
<th>Utilisation and periodicity</th>
<th>Completed by</th>
<th>Data volume annually</th>
</tr>
</thead>
</table>
| New student entry form              | • Person identification data: full name, place/date of birth, gender  
• Languages spoken  
• Names, work status, and level of education of parents  
• Data on disability using Washington Group items                                                   | Used for newly enrolled students                                                           | Teachers                | 57,000               |
| Students’ academic status information | The following codes are used to indicate the academic status of a student:  
• N - New entry  
• P - Promoted  
• R - Repeat  
• D - Dropout  
• E - Re-entry  
• M - Passed away  
• T - Transferred  
• U - Unknown  
Class and shift                                                                   | Used annually to update academic status of all students using codes, indicates the group / shift of the student | Teachers                | 350,000              |
| Teacher status information form     | Grade being taught, teaching subject                                                      | Used annually to update academic status of all students                                    | School administration   | 12,000               |
| Student transfer form (in and out)  | Used for individual students that change schools. Part 1 is used by the school the student leaves, Part 2 is used by the school where the student registers | Used for individual students that change schools                                          | School administration   |                      |
| Annual school form                  | Stock-take of amount and status of:  
• school infrastructure  
• school furniture and equipment  
• health and sanitation  
• number of students and teachers in the school                                        | Used annually for all schools                                                             | School administration   | 1,500                |

In addition, forms for collecting administrative unit information and school location information are completed for new schools or schools which have moved.

The data that are collected are used to publish education statistics and indicators, aggregated by variables such as municipalities (districts), school type, and gender. Individual data are not published. The information is publicly available through the website of the Ministry of Education, Youth and Sport,[60] where data are accessible as MS Excel spreadsheets. Refer to Annex H for a list of the reports produced from the EMIS.

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Policy and data gaps

Note: The number in between brackets against each heading in this section refers to the numbering of the research questions. These numbers are also referred to in Annex J and in Table 1, which set out the consolidated recommendations.

2.1 (1.01) Does the country have a strategic plan to strengthen the EMIS?

As noted in Section 1.9.2, the EMIS is not supported by a dedicated strategic plan or an EMIS policy. The NESP refers to the EMIS but the NESP was developed in 2011 and has not been updated since. The NESP provides very high-level objectives for the EMIS and does not provide a detailed situation analysis.

The NESP proposes the integration of the EMIS with a school-based management system, as well as the decentralisation of some EMIS activities to district\(^6\) offices and schools. The document also recognises the need for ICT capacity development of both EMIS staff and data users. The NESP plans for the procurement of ICT hardware, serving sector-wide ICT needs. The NESP does not plan the institutional and organisational structure for the EMIS, but it does emphasise the importance of aligning structures with the strategic directions outlined by the plan.

The NESP recognises the need to encourage the use of data for the purposes of M&E and policy development, and it recognises that more data are needed in order to achieve this. It proposes that data be published on a website and that sub-national offices of education have direct, customised access to any information that is needed. The NESP also proposes, at a micro-level, that data be made visible on a map through the use of the geographical coordinates of each school.

Despite strenuous efforts by the Government, the full implementation of the NESP has proven to be a challenge to date. The following table describes the two results areas and corresponding activities relevant to the EMIS that were to be implemented by the end of 2015. The extent to which the activities have been implemented by 2019 is briefly commented on in the third column ‘status’:

Table 7. Status of activities planned in the NESP

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Activity</th>
<th>Implementation status (2019)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result 11.3</td>
<td>The digital literacy of all Ministry of Education, Youth and Sport staff is developed, including the capacity of managers and relevant staff to use MIS.</td>
<td></td>
</tr>
<tr>
<td>11.3.4</td>
<td>Train all administrative staff in basic computer skills.</td>
<td>Some training on basic computers took place, but not for all EMIS staff and training did not include data analysis skills.</td>
</tr>
<tr>
<td>11.3.5</td>
<td>Design a training package on EMIS usage and customisation for managers of the Ministry.</td>
<td>Not achieved.</td>
</tr>
<tr>
<td>11.3.6</td>
<td>Ensure all senior and middle management are fully capable of using the EMIS.</td>
<td>Not achieved.</td>
</tr>
</tbody>
</table>

\(^6\) At the time the NESP was drafted the education sector included five sub-national regional offices of education, covering a total of 13 districts. This structure was abandoned in 2012, when regional offices were abandoned and 13 districts were renamed municipalities.
Since it was published in 2011, the NESP has not been reviewed. However, the programme of the current Government seeks to reinvigorate the implementation of the NESP by prioritising specific goals to be achieved by 2023. This includes the reform of the management and administration of the education system at all levels, including developing procedures and systems for M&E. 62

### 2.1.1 Recommendations (1.01)

The EMIS is not supported by a dedicated policy framework or a strategic plan. Implementation of many of the EMIS-related activities in the NESP has not been achieved. The planned review of the NESP and the planning of a loan for the Ministry through the Global Partnership for Education offers an opportunity to the Government to address the need to strengthen the procedures and systems for effective M&E.

1. **Recommendation 1.01.1:** The Ministry of Education, Youth and Sport should develop and implement a policy dedicated to the strengthening of the EMIS, data quality, and the use of data by the Ministry, in response to the Government’s programme to develop the procedures and systems for M&E.

2. **Recommendation 1.01.2:** Undertake a full analysis of the requirements of the EMIS development, which can be used to inform an EMIS strategic plan.

3. **Recommendation 1.01.3:** Develop an EMIS strategic plan that can align with the Government’s five-year ESP (2020–2024). The strategic plan should include a costed, phased approach to development of the EMIS in all sub-sectors, to address the current shortcomings.

4. **Recommendation 1.01.4:** Use the findings and recommendations from the present review as an action plan to inform the ESP 2020–2024.

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2.2 (1.02) Does the EMIS collect and analyse data that are necessary and sufficient to monitor and develop the national education policy framework and sector plan (ESP)?

2.2.1 Main findings

Every year the EMIS Department publishes final statistics approximately six months after the data collection starts in January. The Department publishes key indicators for student enrolment (NER / gross enrolment rate (GER)) and statistics on infrastructure, the staffing of schools, OOSC, dropouts, class size, student/teacher ratios, and the transition rate, aggregated by variables such as geographical area (municipality), type of school (private/public), education level, and gender. EMIS data do not include statistics on the expenditure and revenues of schools, such as the school grant; nor do they include data on learning achievements. Projected population figures, based on the 2015 Population Census Data from the General Directorate of Statistics, are used as a denominator to calculate key indicators such as G/NER and OOSC.

The EMIS Department publishes statistics on the website of the Ministry of Education, Youth and Sport, so that data and indicators can be publicly accessed by Ministry entities and stakeholders, and can be used for planning and M&E. Indicators are not described in a dictionary and Ministry entities are not consulted or informed regularly about the type of statistics that are available and how to use them.

The NESP indicates that the following data should be collected and analysed to monitor implementation of the NESP (There are no EMIS data on higher education and recurrent education). A ‘V’ indicates that the data are collected, an ‘X’ indicates that the data are not collected.
**Table 8. Data required for monitoring implementation of the NESP**

<table>
<thead>
<tr>
<th>Means of Verification (MoV)</th>
<th>PE</th>
<th>BE</th>
<th>SE</th>
<th>Social inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>Gender, disability,</td>
</tr>
<tr>
<td>Number of teachers</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>Gender only</td>
</tr>
<tr>
<td>EMIS for new and refurbished classrooms</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td></td>
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<tr>
<td>Data from the EMIS on furniture and infrastructure</td>
<td>V</td>
<td>V</td>
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<tr>
<td>Data from the EMIS on teacher qualifications</td>
<td>V</td>
<td>V</td>
<td>V</td>
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<tr>
<td>Data from the EMIS on teacher performance</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Data from the EMIS on student learning</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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</tbody>
</table>

The national programme-oriented budget for each education sub-sector should be aligned with the NESP. The annual programme includes indicators that are intended to be used to monitor budget expenditure. In the vast majority of the budget lines, ‘activity reports’ are mentioned as a means of verification for monitoring the implementation of programme activities. The monitoring of the implementation of the annual programmatic budget is not supported by data derived from the EMIS. The Ministry itself does not produce annual implementation reports against budget expenditure. Instead, the activity reports against budget expenditure are sent to the Planning, Monitoring and Evaluation Unit (UPMA) of the Prime Minister’s Office.

An ESA was carried out in 2017 and 2018. EMIS data were instrumental in informing development of the ESA. The ESA report includes in-depth analyses of each education sub-sector and uses both population data and EMIS data for this purpose. The ESA analysis will be used to inform a five-year ESP (2020–2024), which is to be developed during 2019, with funding support from the Global Partnership for Education. The ESP development represents an opportunity to reassess the EMIS development strategy in light of the changing requirements since 2011.

Disaggregation of EMIS data used for monitoring is generally limited to gender and municipality. Although the EMIS Department collects and publishes data on in-school-children and OOSC, the individual student data on disability, mother tongue, and socioeconomic status of parents (work status, academic background) are not systematically used by the Ministry to monitor the implementation of strategic plans, or for equity analysis to better understand who are left behind. However, these data are used for special reports, such as for the OOSC Country Study for Timor-Leste produced by the Ministry of Education, Youth and Sport with the support of UNICEF.

The lack of extensive use of indicators for monitoring the implementation of strategic plans is partly explained by the low level of awareness of how to use the data that are collected, as well as the insufficient understanding of education indicators. The EMIS Department has acknowledged that the accuracy of some of the individual data is poor, particularly data on disability status, which leads to reluctance on the part of the Department to encourage the use of related indicators.

The intention to enhance the utilisation of data for planning and M&E is evident, and is formulated by the Government as one of the goals of the NESP: ‘The entire planning, funding and procurement process is of quality, and implement steps to monitor its effectiveness, using education data and population data as a key planning, monitoring and evaluation tool.’

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63 UPMA: Unidade de Planeamento, Monitorização e Avaliação.
67 P. Gomes, interviewed on 1 April 2019.
The NESP and several consequent reviews reported the lack of capacity among Ministry staff to use data for monitoring and policy development. Some training interventions have taken place since the NESP was launched, however these have been mostly incidental, ad hoc training courses, not a systemic capacity development approach to encourage data-driven decision-making.

The EMIS Department has some capacity to analyse and report data but other departments report limited capacity to do so or are not aware of the available data. Capacity development of National Directorates, municipality offices, and, in time, school directors, is needed for them to increasingly undertake effective planning and M&E that is driven by data.

### 2.2.2 Recommendations (1.02)

Use of the EMIS in sector analysis and planning is generally undertaken sector-wide, and at the national level, with strong assistance from development partners. Although the EMIS collects data that can be used by the Ministry of Education, Youth and Sport to monitor implementation of its programmes, the Ministry has yet to develop the internal mechanisms and capacity for effective and periodic monitoring.

1. **Recommendation 1.02.1:** The Ministry should establish a senior M&E unit in the Ministry, tasked with analysing data and facilitating data-driven monitoring and reporting by the Ministry, and with developing in-service training packages for managers at national, municipality, and school level. This unit should ensure departments use data for monitoring equitable access, implementation of action plans, informing policy development, and planning procurement. This unit could be an individual data specialist, based in the Minister’s Cabinet and capable of providing capacity development support to senior Ministry staff. The unit should partly substitute for and expand the current data output activities conducted by the EMIS Department.

2. **Recommendation 1.02.2:** The ESP 2020–2024 should be used to support development of the EMIS, enhancing the relevance of data for improved monitoring of the implementation of the strategic framework and developing the requirements to use EMIS data for monitoring plans, education policies, and SDG indicators.

3. **Recommendation 1.02.3:** The M&E unit / data specialist should facilitate continuous professional development of General and National Directors and Municipality Education Offices regarding the interpretation of EMIS data and utilisation of data for decision-making.

4. **Recommendation 1.02.4:** A local management training institution should be tasked with developing management training modules on using the EMIS for education planning, administration, and other functions. This may be done in conjunction with a recognised training institution, such as the UNESCO International Institute for Education Planning. Management should be required to participate in regular in-service training to improve information use.

5. **Recommendation 1.02.5:** Issue a Ministerial Decree mandating the use of EMIS data and explaining the conditions under which EMIS use is mandated.

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2.3 (1.03) Does the EMIS collect and analyse data required for the monitoring of SDG targets and indicators?

2.3.1 Main findings

Supported by UIS, the Ministry of Education, Youth and Sport has commenced analysis of EMIS data to monitor the SDG targets and indicators. This initiative is led by the Office of the Prime Minister. The National SDG Roadmap mapped SDG targets to the Millennium Development Goals referred to in the SDP and NESP 2011–2030; however, this did not include targets for individual SDG indicators.

There is an intention to increase the use of EMIS data for monitoring SDG indicators. Timor-Leste is one of the countries that is undertaking an SDG Voluntary National Review in 2019, which covers SDG 4. The Government’s SDG Working Group is preparing a cross-ministerial template, which each sector ministry can use to record the data that are required to monitor the SDG indicators. One of the sheets is dedicated to the Ministry of Education, Youth and Sport: it lists the global targets of SDG 4 and two additional targets responding to SDG 8 (inclusive and sustainable economic growth) and SDG 12 (Sustainable consumption).

However, the template does not include consideration of the 43 thematic indicators for the SDGs, only the 11 core indicators. Further, the template has not been completed and a date for finalisation has not been established. The Government has issued a directive (in February 2016) mandating that the SDGs should be reflected in annual plans and budget.

2.3.2 Recommendations (1.03)

As in the case of monitoring strategic plans and policy development, there is insufficient capacity in the National Directorates to drive the use of EMIS data for monitoring SDG indicators or for fully integrating the SDG indicators into plans. The previously proposed M&E unit / data specialist, could be tasked with the continued mapping of the EMIS data to the SDG indicators, including thematic and national indicators. If that recommendation is not feasible and the current structure will be maintained, then the National Directorate of Planning requires intensive technical support to start monitoring against the SDG indicators. It is also acknowledged that many SDG 4 indicators can only be calculated using household survey data. It is therefore important that the Ministry works closely with the General Directorate of Statistics.

1. **Recommendation 1.03.1:** The National Directorate of Planning and Inclusive Education should be supported by a data analysis unit (refer to Recommendation 1.02.1 and Consolidated Recommendation #4 in Table 1) to develop a plan to progressively use data to monitor the SDG indicators.

2. **Recommendation 1.03.2:** Complete the mapping of EMIS data to global and thematic SDG indicators and collect additional data, enabling monitoring against national indicators that are considered relevant to the Ministry.
2.4 (1.04) To what extent does the EMIS capture data and information in ways that allow for equity analysis?

2.4.1 Main findings

The EMIS collects individual data on gender, religion, mother tongue, disability, and socioeconomic background of parents, including work status and education background. This happens once at the point the student enters the EMIS, which should correlate to the first year of enrolment.

Measuring disability

School directors and coordinators are responsible for collecting data on disability when a child enrols in a school. In practice, this task is often delegated to thousands of teachers, who have received no training on the completion of EMIS forms. They measure disability through a methodology of self-reporting by parents or other family: teachers use the Washington Group questions to ask the family of the child if the child has any disabilities, including learning difficulties. The vast majority of teachers have not been trained to assess hearing problems, visual impairment, or other symptoms of a disability. Therefore, the data on disabilities may not be reliable. An interviewed school director could indicate the number of children with disabilities in his school, but these numbers were based on observations by school staff, not using the Washington Group questions in the EMIS form.70

The National Department for Inclusive Education has therefore created its own checklist on disability, which is completed by its own staff who have a better capacity to make an accurate judgement. One director explained that they wish to see the EMIS form updated so that the form includes detailed indicators that are easier to measure by a teacher.71 The same director indicated the importance of Grade 1 teachers attending the annual EMIS training, as those are the teachers that conduct the assessment of disability and other disparity variables when a new student enters the system.

Identification of vulnerable children

Some household data are collected through the new student entry form. As in the case of disability, these data are recorded using a methodology of self-reporting. Parents are asked to verbally provide information on their work status and their education background. School staff indicated that parents are sometimes reluctant to provide (accurate) information on their work status.72

The methodology of self-reporting on student characteristics such as disability and socioeconomic factors does not result in highly accurate data. This is a reason for the EMIS Department to be cautious in conducting equity analysis.73 In addition, and as noted earlier, many departments within the Ministry of Education, Youth and Sport are not aware of the type of data that are recorded by the EMIS.

Individual data concerning vulnerable children are not used for targeting support. The methodologies for collecting data about vulnerable children and disability are not robust enough to allow for reliable use of the data. Because of suspected (and confirmed) issues around the quality of data, in particular the data’s accuracy, the EMIS Department does not publish statistics on equity analysis. The only variables that are used for periodic, disaggregated reporting in accordance with SDG 4.5 (disparities), are gender and municipality.74 The remaining variables are not published:75 The EMIS Department can provide data on disparities on request.76

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71 J. Monteiro, interviewed on 13 March 2019.
73 As reported in interviews with the EMIS Department.
74 The census data can be disaggregated to smaller geographical units, such as sukos, aldeias, schools, and students; however, they are not made available at such levels except via special request.
75 Not on the website of the Ministry, nor in the statistics that were published in the Statistical Year Books or Education Data Books.
76 One example was described under Section 3.2 of a case where indicators on children with disabilities were presented during a cross-
2.4.2 Recommendations

Individual data are collected that, in theory, can be used for equity analysis. However, this does not occur in practice because of suspected accuracy issues. At the same time, collecting, entering, and verification of individual student data puts a significant burden on the EMIS Department. It is questionable whether, unless the methodology for data collections changes and the capacity of data collectors is developed to the extent that they can conduct professional assessment, the EMIS should continue to collect all individual student data.

1. Recommendation 1.04.1: Use the results of an audit of the quality of data (see Recommendation under Section 3.6) to inform a review of all items in EMIS forms and maintain items that generate data of sufficient quality to be used for equity analysis.

2. Recommendation 1.04.2: Data collectors (including teachers) should be properly trained on the collection of individual student data, in particular the use of the Washington Group methodology, if the data on disability are to be reliable. A review should be undertaken of the complexity and appropriateness of the methodology and consideration should be given to including the detailed responses in the EMIS for consideration by administrators.

3. Recommendation 1.04.3: A survey should be undertaken of vulnerable children, including those with disabilities, to assess the accuracy of EMIS data and to make recommendations to improve the accuracy of the recording of data.

4. Recommendation 1.04.4: Review the methodology for the assessment of disability status, including the formulation of questions and professional development of school staff conducting the assessment.

5. Recommendation 1.04.5: Review the methodology for collecting information about the socioeconomic status of children to ensure more accurate data are reported through the EMIS.

6. Recommendation 1.05.6: Publish data disaggregated by sukos, aldeias, and schools for required indicators.

2.5 (1.05) How, if at all, does the EMIS address issues around OOSC (including children at risk of dropping out)?

2.5.1 Main findings

The OOSC indicator is published annually on the website of the Ministry of Education, Youth and Sport. The denominator that is used to calculate the indicator is the Population Census Data from 2015, using projections for the year of reporting. Data are not shared beyond the Ministry’s website unless there is a specific request.

OOSC data are disaggregated by age group (per year), gender, and municipality. Data are not disaggregated by disability, academic background of parents, or work status of parents. The EMIS Department does not collect data on children that are at risk of dropping out. Because data are aggregated by municipality, it is difficult to track OOSC down to administrative levels of sukos or aldeias. One of the leading non-governmental organisations indicated awareness of data on OOSC, but the organisation would only be able to use data if disaggregated down to village (aldeia) level.77

The following table presents aggregated data on OOSC in 2017 and 2018, by age between six and 17 years. The denominator that was used to calculate the indicators is the 2015 Population Census. The percentage of OOSC who are six years of age has doubled between 2017 and 2018. For children aged seven, the percentage has dropped by a factor of four during the same years. These are remarkable discrepancies and figures that may be indicative of issues around the accuracy of data (refer to Section 2.6).

77 N. Seibel and A. Neraw, interviewed on 14 March 2019.
UNICEF and the Ministry of Education, Youth and Sport conducted a country study on OOSC as part of the Global Initiative on OOSC. The report was published in 2017 and provides in-depth analyses of the magnitude, location, and characteristics of OOSC. It used various data sources, including the EMIS (2011–2015), the National Population Census (2010), and data from the Household Income and Expenditure Survey (2011). The study investigated OOSC from pre-primary to lower secondary level, both at risk of dropping out of school and those children who were OOSC.

The report describes barriers causing children to be out-of-school, distinguishing between barriers that are of an institutional, social, financial, and technical nature. The report formulated 12 recommendations, which are to ‘serve as a good reference for the sector analysis, to feed into a revised education sector policy aimed at addressing the problem of exclusion in education and supporting children in school but at risk of dropping out.’

The report concluded that the Government’s systems for monitoring and assessing OOSC are weak, and that some disadvantaged groups of children are invisible to current data collection efforts, such as street children or other undocumented children. The report also suggests developing the institutional arrangements and technical capacity of the Ministry to address the needs of excluded children. The report notes that improving and increasing the use of EMIS data to monitoring mechanisms affecting children’s timely access and transitions in education can help improve retention.

The OOSC report was used as a reference for the ESA. However, the report has not yet resulted in changes on how OOSC are reported on or identified. The publication of the report may have resulted in an increased awareness of OOSC; however, further action is needed to address the recommendations.

### 2.5.2 Recommendations (1.05)

1. **Recommendation 1.05.1:** The EMIS Department should review the data for children who are not accommodated in OOSC figures and determine methods for ensuring these children are identified and included.

2. **Recommendation 1.05.2:** Children at risk of dropping out should be identified by the EMIS based on attendance and other factors that have yet to be defined by the Ministry of Education, Youth and Sport. These children should be targeted for special assistance. Alternatively, the Ministry should consider setting up a system that allows the identification of children at risk of dropping out, through the monitoring of attendance and other indicators at the school level.

3. **Recommendation 1.05.3:** Other departments require training on the use of OOSC data for planning education. In particular, non-formal education programmes need to be aware of OOSC and the magnitude and location of those children being left behind. The provision of programmes such as primary and middle school equivalency should be assessed based on the types of OOSC. This requires the accurate use of OOSC data.

4. **Recommendation 1.05.4:** Develop tools and methodologies to identify children that are not at school, disaggregated by suko level, as a step towards schools using OOSC data as a tool to resolve barriers around OOSC.

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Table 9. OOSC by age for 2017 and 2018

<table>
<thead>
<tr>
<th>Age</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>14.3%</td>
<td>10.29%</td>
<td>4.26%</td>
<td>1.94%</td>
<td>0.00%</td>
<td>10.09%</td>
<td>11.16%</td>
<td>9.03%</td>
<td>14.59%</td>
<td>18.93%</td>
<td>25.53%</td>
<td>29.63%</td>
</tr>
<tr>
<td>2018</td>
<td>29.8%</td>
<td>2.58%</td>
<td>7.99%</td>
<td>3.93%</td>
<td>2.64%</td>
<td>0.00%</td>
<td>12.73%</td>
<td>13.08%</td>
<td>11.26%</td>
<td>18.03%</td>
<td>23.30%</td>
<td>33.43%</td>
</tr>
</tbody>
</table>


80 Idem., p. 67.
5. **Recommendation 1.05.5:** Share relevant OOSC data and indicators with schools, as a quality assurance measure and as a first step towards using data to make improvements at the school level so schools and communities are aware of OOSC issues.

2.6 (1.06) **What are the various aspects that contribute to the quality of the EMIS?**

2.6.1 **Main findings**

An important prerequisite for using EMIS data is that the data are of good quality in terms of coverage, completeness, relevance, accuracy, and timeliness.

The EMIS Department collects relevant individual student data that can potentially be used for equity analysis and supporting disadvantaged groups. The country-wide coverage of all public and private schools illustrates another positive aspect of the quality of the EMIS data. Given the considerable volume of data that are collected and verified, a six-months data cycle for finalising annual data is reasonable, given the current systems, methodologies, and human resources. Furthermore, the data are entered and managed centrally at the national level. There is no capacity for stakeholders at the lower levels of government or schools to engage with the individual student data. This severely limits the capacity to verify and quality assure data in an efficient manner. As result, the data collection and verification cycle is completed around the time (July) when the directorates submit annual budgetary plans. Several Ministry of Education, Youth and Sport officials, including the Director of Finance, indicated that they have to use data from the previous year for annual budgetary planning.81

Policies, manuals, and (international) standards can help ensure data meet quality standards. However, the EMIS Department has not documented any requirements for the EMIS data to meet quality standards, and nor has the Ministry of Education, Youth and Sport. There is also no legal framework to describe compliance areas.

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81 M. Monteiro, interviewed on 18 March 2019; M.V. da Costa, interviewed on 14 March 2019; F. Paixote, interviewed on 14 March 2019
Even though EMIS data are referred to in programmes and used for sector analyses, the lack of a policy concerning the transparency and quality of EMIS data has resulted in a general sense of uncertainty as to what extent the EMIS data can be trusted in terms of accuracy. In addition, some reports, such as the ESA report and the report on the OOSC Initiative, have flagged cases of suspected quality issues around data.

There are no systems in place to assess the accuracy of data. The EMIS Department does not triangulate EMIS data with that obtained from other data sources, such as household surveys, nor are physical data verification checks undertaken in a structured way.

Quality issues particularly surface when data are disaggregated. The OOSC indicator presented in the previous Table 9 is a national figure on OOSC, not disaggregated by gender or municipality. When disaggregated OOSC figures are used, data anomalies are significant, such as the number of municipalities with male OOSC but no female OOSC (refer to Annex I). In the municipality of Manufahi, for instance, the OOSC percentage for males is 16.05% and for females it is 0.00%, which is unlikely, and the aggregated average is 0.00%. An advisor to the Minister’s Cabinet indicated that the Minister is a strong supporter of using data for improved decision-making. However, the respondent indicated that there are uncertainties around the accuracy of the data. An audit of the quality of the EMIS data could provide better insight into the level of accuracy of the data.

Duplicated student records present within the EMIS are also an issue. Student, teachers, and schools receive a unique and permanent identification number upon entering the system. This helps detect duplicate registrations and it could eventually enable the tracking of individual students, teacher management, school rationalisation etc. However, the EMIS database contains duplicate students. A recent review of the EMIS resulted in the removal of a significant number of duplicated students and teachers. It is not clear how many more duplicates exist in the database.

The system automatically flags suspected duplicated data entries when two students carry identical names and have the same date of birth. In these instances, data entry staff are instructed to compare different entries under the same name. They do so by checking the full name of both parents. If a duplicated entry is confirmed, the oldest data entry is deleted from the database and the latest one is kept. This is not infallible: the system does not tolerate typing mistakes, sometimes forms are not readable, and data verification does not always result in appropriate corrections.

There are several reasons for duplicated students. One cause is that parents do not always know the date of birth of their child. Parents are reported to give responses like ‘born during the dry season’ or ‘born during the wet season’, without being able to indicate in which year the child was born. Thus, when one student is recorded twice under the same name but with a different date of birth, the system does not detect this as a duplicated student. In another case, teachers record the age of the student according to the parents, but the child appears much younger than the reported age. The EMIS Department flags these issues of over-aged children; however, during the verification process the teacher feels s/he is not in a position to challenge the responses from the parents. One of the possible remedies would be for parents to bring the birth certificate of the child, when their child enrols.

Another quality issue arises when students migrate to a different school or leave a school without registering at a new school. Following undocumented guidelines, the school the student departs is required to complete the first part of the student transfer form. When the former school then is asked to complete the annual student form, it registers the student simply as being ‘transferred’ (code T). Until these students are registered at a new school, their previous schools continue to record the student as being in transfer, whereas the reality is that these students may have dropped out from school. In that case the EMIS cannot detect these OOSC. There are also reported cases of schools that do not complete the transfer form but continue to report the missing student as repeating the class, resulting in over-aged students that in reality are no longer enrolled. If these students did

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82 As reported by departments of Ministry of Education, Youth and Sport interviewed for this research. Many Ministry staff openly questioned the quality of the EMIS data but were not able to verify their claims with evidence.
83 D. Katzman, interviewed on 12 March 2019.
84 K. Saeed, interviewed on 3 April 2019.
migrate to a new school without having used the student transfer form, then a new school uses the new student entry form. Only if the full name, date of birth, and the full name of the parents are exactly identical is the EMIS able to detect this duplicated student. Similarly, when a student drops out, but returns the next academic year, it is reported that schools report the student as being a new student. Sometimes parents register one child at different schools, each school registering the child as a new student. Schools do not comply with undocumented regulations, which puts great pressure on the verification process and the capacity of the EMIS Department to detect duplicated students.

Furthermore, the EMIS collects information on the parents’ education level at only one point in time, when a new student enrols. The EMIS does not record any changes if parents find or change jobs or complete additional courses during the academic life-span of a student. This also applies to the collection of data on student characteristics, such as disabilities. In other words: data on the work status and educational background of parents of students that are currently in Grade 10 were recorded 10 years ago and have not been updated since. However, when a younger sibling enters the EMIS database, then background information of the same parents is recorded again, without making an update of the records of the same parents under the previously enrolled, older siblings.

2.6.2 Recommendations (1.06)

Despite issues around the accuracy of data, methods for identifying and tracking individual children are quite robust in comparison to other countries. However, the accuracy of much of the data appears to be an issue and the lack of access to data for sub-national and school-level stakeholders limits the capacity to verify and quality-check data. A recent study on data in basic education reported on similar issues and recommends an audit of the data quality. The results of a review or audit can be used to provide direction to a strategic review of the EMIS and can help the Ministry of Education, Youth and Sport to prioritise the collection and utilisation of data that do meet quality standards.

1. **Recommendation 1.06.1:** The Ministry of Education, Youth and Sport should conduct an audit of the quality of the EMIS data, including the formulas used to calculate indicators, to assess the data’s accuracy.

2. **Recommendation 1.06.2:** The results of the audit should inform a wider review of the EMIS, to help the Ministry develop a policy framework for quality aspects, and to prioritise the collection of data that do meet standards. Data quality guidelines should be developed for the EMIS, to help ensure data quality. The guidelines may also result in changes to regulations concerning management and verification of data.

3. **Recommendation 1.06.3:** School inspectors should conduct spot-checks in schools to monitor whether schools are providing accurate data, and to help verify the accuracy of data. Issues relating to EMIS data should be recorded upon the completion of the inspection of a school. This can help identify schools that are providing poor data.

4. **Recommendation 1.06.4:** Feedback loops should be reviewed for comments on bad data. This should encourage the use of data by helping to strengthen the perception that poor data can be assessed and corrected by those tasked with using the data.

5. **Recommendation 1.06.5:** Direct access to the EMIS should be granted to schools and municipalities to help manage and verify individual student data. This will help improve the accuracy and timeliness of data.

6. **Recommendation 1.06.6:** Build in additional validation checks, to prevent inaccurate data entries.

86 Idem.
2.7 (1.07) What are the (data) quality assurance processes in place and how effective are they?

2.7.1 Main findings

Individual student data are collected, which in itself is a data quality assurance process. Efforts are made to ensure students are uniquely identified by providing an EMIS identification number at the point of time when the EMIS Department registers a new student. Parents have to bring proof of the date of birth of the child, such as a birth certificate or the Democratic Republic of Timor-Leste (RDTL) certificate. These data are not stored in the EMIS. However, if parents fail to bring documentation, schools will still enrol the child. The age is then verbally provided by parents or caretakers.

There are data quality assurance processes detailed in the section above which concern student transfers and uniquely identifying students. These processes help ensure that data accuracy is maintained but, as noted above, there are some issues which can result in poor quality data.

In the broader context, quality assurance processes supporting the collection, verification, and utilisation of EMIS data are not well documented. Until 2013, it was common practice for different departments of the Ministry of Education, Youth and Sport to collect duplicate data on teachers and schools, mainly for procurement processes. This practice came to an end in 2013, when the Vice-Minister (the current Minister of Education) issued a dispatch instructing all Ministry entities to solely utilise EMIS (or PMIS) data as a source for planning and evaluation. The dispatch instructed departments to collaborate with the EMIS Department to help enhance the quality of data by reporting any issues regarding the data to the EMIS Department. Since then, Ministry entities have indeed exclusively used EMIS data and have abandoned the practice of collecting parallel data.

Other than this instrument, Ministry departments, municipality offices and schools are not legally mandated to provide accurate data in a timely manner to the EMIS Department. There are no warning systems or penalties for schools not meeting compliance areas. The absence of legislation is likely contributing to issues of data incompleteness and poor timeliness.

At the sub-national level, municipality offices have a designated staff member (the EMIS official), who is responsible for checking the coverage and accuracy of data, and ensuring that new data are submitted on time to the EMIS Department. Similarly, each school director or coordinator of filial- and pre-schools is responsible for submitting and checking complete, accurate, and timely data. However, these roles and responsibilities are not documented but rather they are verbally explained on an annual basis when the EMIS Department distributes the EMIS forms to help support school directors and coordinators. All school directors and pre-school coordinators are invited to attend training on completion of EMIS forms and there is no discrimination between private and public schools. In some cases, directors of central basic education schools delegate participation to an administrative staff member of the schools (Gabinete Apoio Tekniku). Following training, school directors of basic education schools are expected to pass the training on to the coordinators of filial schools and relevant administrative staff that are responsible for the completion of data. However, this cascaded training is not supported by manuals or guidelines.

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89 2013 Ministerial despatch to all National Directors on the utilisation of data, referenced on 18 March 2019.
2.7.2 Recommendations (1.07)

The absence of any manuals or guidelines regarding the collection and verification of data, and the absence of documented description of roles and responsibilities, makes it difficult to identify the shortcomings of the methodologies. It also makes it difficult to hold staff to account for implementing the tasks and meeting the standards.

1. **Recommendation 1.07.1**: The Ministry of Education, Youth and Sport should review and further develop the regulating framework of the EMIS Department and document all organisational processes of each step of the data collection and verification cycle.

2. **Recommendation 1.07.2**: The Ministry should issue a policy (as part of the EMIS policy) mandating the timely submission of education data required from the EMIS from all public and private institutions.

3. **Recommendation 1.07.3**: Legislation concerning the submission of false, misleading, or late data should be enacted for the Ministry. Penalties should be imposed for the submission of late or misleading data.

4. **Recommendation 1.07.4**: Develop guiding manuals, practically explaining the role and responsibility of each person in the data submission and data verification process.

2.8 (1.08) How does the EMIS protect the data privacy of students and teachers?

2.8.1 Main findings

The privacy of individuals’ data is protected based on what various respondents called ‘common sense’. Individual data from teachers, students, and parents cannot be accessed through the website of the Ministry of Education, Youth and Sport. Only data collectors (school staff), EMIS officials in municipality offices, and data entry staff are exposed to individual data when entering data into the system. The Chief of the EMIS Department is the only member of staff that can directly access the SQL Database containing the individual student data.

However, the protection of data privacy is not regulated by legislation and there is no mandate for the access and use of EMIS data by Ministry entities and stakeholders.

The EMIS database itself has its own local server, protected by the SQL Database security. An upgrade of the application hosting is needed by July 2019, when support from Microsoft for this version of the application comes to an end.

2.8.2 Recommendations (1.08)

Despite data on individuals being collected, there is no legislation, regulation, or policy to govern the use of individual data. Not only does this not protect the rights of individuals but it also may hamper researchers and other data users who may need to access data on individuals. At present there are no guidelines governing such access and use.

1. **Recommendation 1.08.1**: Develop and enact legislation regarding the rights of individuals to data privacy concerning EMIS data.

2. **Recommendation 1.08.2**: Develop guidelines concerning access to and use of individual data, including criteria to ensure the anonymity of individuals.

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2.9 (1.09) How does the EMIS interact, if at all, with other administrative data systems (e.g. health, social welfare, civil registry, labour)?

2.9.1 Main findings

The NESP indicates that the PMIS should be integrated into the main EMIS database; however, presently this is not the case. The EMIS operates as a stand-alone system and there is no interaction with other administrative data systems, such as the PMIS (managed by the Public Service Commission) and Free Balance (Ministry of Finance), used to monitor public expenditure.91

Each student has a unique EMIS number and that number is only used for the EMIS, not by other systems such as the civil registry (or vice versa). The EMIS also collects data on teachers and staff that are not paid by the state. These staff are excluded from the PMIS database.

Changes to the PMIS, managed by the Government’s Komisaun Funsau Publika,92 require excessive use of paperwork to ensure synchronisation and alignment of data between the PMIS and the EMIS. These processes, if followed at all, cause duplication or triplication of paperwork, and repetition of data entry and verification, resulting in conflicting information.

A previous diagnosis of the systems, reported on in 2015, resulted in a recommendation to develop an EMIS-PMIS system that fully synchronises data on teachers and staff, or to develop an EMIS that makes use of the Komisaun Funsau Publika’s PMIS portal.93 The report also recommended that data should be fully consolidated prior to the integration of the databases. The recommendations have not yet been addressed.

At present there are no other linkages or interactions between the EMIS and systems in other ministries. The EMIS uses its own coding standards for students, which are not used in other databases and data are not shared in any way.

91 M. Monteiro, interviewed on 18 March 2019.
92 Public Commissioner
2.9.2 Recommendations (1.09)

1. **Recommendation 1.09.1:** Integrate PMIS databases on teachers as part of the EMIS so that data are fully and automatically aligned.

2. **Recommendation 1.09.2:** If the Government establishes a civil registry the EMIS should align its student data with the registry.\(^94\) This would provide a database of all children in the country who are registered, and would enable more accurate tracking of individual children and identification of OOSC.

3. **Recommendation 1.09.3:** Government coding standards should be developed. Dialogue should commence between sectors regarding the use of a unique national code for individuals in the different sectorial databases. Ideally, a civil registry should form the basis for the unique code. Databases should be aligned on the coding system. Coding systems for other entities common to multiple government systems, such as institutions, assets, and regions, should be developed. This would ultimately enable the sharing of data between systems and the identification of children who are not gaining access to essential services, such as vaccination, education, and child welfare services. While such alignment may take many years, the process should be started.

4. **Recommendation 1.09.4:** Use the recommendations from the 2015 Management Strengthening Report (World Bank) to integrate PMIS and EMIS data and conduct an audit of the accuracy of data in both databases.

Implementing these recommendations will help the Ministry of Education, Youth and Sport to integrate and align different datasets, in order to consolidate data and to reduce duplication, triplication, and paper trails. In the longer term, it will help the wider government monitor the reach of multiple government services.

2.10 (1.10) How is the EMIS managed and where is it situated in the data architecture or statistical systems of the country?

2.10.1 Main findings

The EMIS is managed by the Department of EMIS, which reports to DNPPMA. DNPPMA is responsible for the M&E of the NESP.

DNPPMA reports to UPMA concerning implementation of the annual action plans. UPMA is a unit located under the Prime Minister’s Office.

UPMA also collects statistical data from ministries as part of its coordinating role to support the activities of the Working Group on the SDGs. A template has been prepared for all ministries to indicate whether ministries can provide data against the SDGs indicators.

In addition, DNPPMA submits data to the National Statistics Office, under the Ministry of Finance.

One issue that results from this arrangement is that the EMIS Department lacks authority to enforce data regulations, as it is seen as a sub-unit under DNPPMA.

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\(^94\) The Government of Timor-Leste has not established a civil registry. A UN-supported project to provide a unique ID for Timorese is in the early stages of development.
2.10.2 Recommendations (1.10)

1. **Recommendation 1.10.1**: DNPPMA should continue the mapping of education data to the SDG indicators and targets.

2. **Recommendation 1.10.2**: Legislation or policy should be developed and passed giving authority to the EMIS Department concerning relevant statistical matters and standards for the Ministry of Education, Youth and Sport.

2.11 (1.11) Are sufficient resources (human and financial) available for the EMIS?

2.11.1 Main findings

**Human resources**

The current centralised data entry process is labour-intensive, resulting from high volume of collected data annually. It normally takes approximately six months for the EMIS Department to collect, enter, verify, and clean all the data. It needs to be noted that this deadline is unlikely to be met in 2019, because of the significant reduction of staff in the EMIS Department: instead of the previous 21 data operators, the EMIS Department now has five permanent data operators left. The reduction is being partly resolved by providing an opportunity to university students to do an internship. However, these are untrained resources that are based in the Department for a short period of time only.

Should a review of the EMIS result in decentralised data entry using updated IT solutions a full functional review of the EMIS Department will be needed to assess where human resources are needed. The recommended full requirements analysis (Recommendation 1.01.2) should therefore include a needs assessment in respect of human resources.

**Financial resources**

The availability of financial resources has been sufficient to sustain current operations, mainly covering the costs of the annual training in municipalities, and the printing and distribution of EMIS forms. However, the present budget does not accommodate recurrent training of staff at the school level. Further, if the system is made more applicable to school use then there will likely be a requirement to assign a school focal point for the EMIS, and to ensure that person is properly trained.

There are no financial resources for the maintenance of ICT equipment, the replacement of furniture, archiving of EMIS forms, etc. There is also no budget for the development of the EMIS (see subsequent section). Similar to the previous remark, should the processes change, then the allocation of financial resources should also be reviewed.

2.11.2 Recommendations (1.11)

1. **Recommendation 1.11.1**: Assess the annual training requirements of staff at school and municipal levels to ensure professional development needs can be regularly addressed.

2. **Recommendation 1.11.2**: Use the full requirements analysis (Recommendation 1.01.2) to specify the annual operational budget of the EMIS.

3. **Recommendation 1.11.3**: Undertake a cost-effectiveness study regarding the possibility of utilising local service providers for hosting the EMIS and for development of the EMIS.
2.12 (1.12) Is there an annual budget allocation to improve the EMIS?

2.12.1 Main findings

As noted, the EMIS Department has no specified budget. Its operational budgets for goods and services is part of the overall budget of the DNPPMA.

The sub-programme Institutional Management’s budget for 2019 of $55,95395 only includes operational costs for collecting and reporting data. There is no development budget allocated for the EMIS. There is presently no financial support from external agencies.

The NESP 2011–2030 indicates a budget to implement the objectives allocated to the EMIS; however, the budget is not specified for just the EMIS, it also covers results activities for ICT development under Priority Programme 11. In addition, a detailed budget is not included in the NESP: approximately $292,000 was allocated for all of ICT development annually. The NESP states that ‘Costs will initially focus on ICT infrastructure to link the components of the education sector and expansion of EMIS to all the educational sub-sectors, the development of GIS and the integration of other related databases (payroll, census, financial, human resources and other).’

There appears to be no fixed recurrent budget for the maintenance of ICT equipment. Many systems that are used are outdated, with several broken computers and printers, and outdated software. A detailed assessment of the ICT equipment was conducted in 2014 but there have been no improvements since. A recent review of the systems revealed that many of the items of ICT equipment are broken and supporting software is out of date – to the point that it poses data security issues (refer to Annex F).

95 Under budget item 5100205: Planning, monitoring, evaluation and statistics.
2.12.2 Recommendations (1.12)

1. **Recommendation 1.12.1:** As noted in Recommendation 1.1.1, a strategic plan for the EMIS should be developed, to align with the (proposed) ESP 2020–2024. The plan should specify the annual development and operational budget required and specify how this will change over time as innovations are undertaken, such as decentralisation of data entry. This should help engage partners and foster required funding for the EMIS. The plan should also include the budget required by each department for training on, and to be able to adjust to changes in, the EMIS.

2. **Recommendation 1.12.2:** Closely linked to the recommendation above, the EMIS Department should specify annually the operational and development budget required, as separate from DNPPMA.

3. **Recommendation 1.12.3:** The operational budget for the EMIS should include an allocation for upgrading or the replacement of hardware used for the EMIS, internet connectivity (if applicable), and recurrent training for staff at all levels in the access to and use of the system.

2.13 (1.13) Do parents and teachers have access to EMIS data and do these data result in improved pedagogical outcomes?

2.13.1 Main findings

EMIS data are not shared with municipality offices or schools, other than a set of EMIS forms to be used for verification purposes. The only way that municipality staff, school staff, and parents can access data is through the website of the Ministry of Education, Youth and Sport. In practice, this is highly unlikely given the limited awareness of the website. Furthermore, the indicators on the website are described in English, which most parents and teachers cannot understand, and the indicators are not narrated. In addition, statistics are not presented in such a way that parents can access individual data of their children or school data.

2.13.2 Recommendations (1.13)

The data in the EMIS should be relevant and accessible to actors at the municipal and school level. This is essential to ensure increased use of the EMIS data, which will lead to increased accuracy and completeness of data. The methods by which schools can access EMIS data should be increased. Schools should receive EMIS data in a form which helps them to undertake school planning and to facilitate student management.

1. **Recommendation 1.13.1:** The EMIS Department should publish a description of indicators and disaggregation of data in one of Timor-Leste’s two official languages, as a first, minor step to facilitate access to and use of EMIS data.

2. **Recommendation 1.13.2:** The Ministry of Education, Youth and Sport should annually share relevant EMIS data and indicators with municipality offices and schools in order to facilitate access to data. Data should be shared in a format that has meaning to school heads, administrators, teachers, and communities.

3. **Recommendation 1.13.3:** Review the planning and monitoring requirements for municipalities and develop reports from the EMIS which reflect planning needs. Monitor the use of EMIS reports in planning and monitoring.

4. **Recommendation 1.13.4:** Develop a school portal to the system that will enable schools that are able to access school data and replace manual student record-keeping with electronic student record-keeping.

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97 Replacement or upgrading costs for hardware are typically 15% to 20% of the total cost of the hardware for any organisation.

5. **Recommendation 1.13.6:** Develop and pilot a student report card from the EMIS to enable schools which can access the EMIS directly to generate student report cards.

6. **Recommendation 1.13.7:** Develop a school report card that is linked to school development planning. The school report card should be published on the Ministry website annually and be searchable for each school. The report card should indicate progress towards national goals, such as reducing dropout and the provision of adequate facilities. There are many examples of such report cards but it is important that the report cards are applicable to school planning in Timor-Leste.

### 2.14 (1.14) What were the key drivers, processes, challenges, and costs of the transition from aggregate data systems to individual child systems?

#### 2.14.1 Main findings

Individual student data have been collected since the current EMIS was established in 2008. There is insufficient institutional memory to recount the period of transition to individual student data. There appear to be no documents detailing the transition.
Review of EMIS that track individual student data: Timor-Leste
Data analysis and utilisation

3.1 (2.01) To what extent are the EMIS data accessible to intended ministries and the public?

3.1.1 Main findings

EMIS data are accessible through the website of the Ministry of Education, Youth and Sport, in fixed spreadsheets, aggregated at municipality level. As noted, the indicators and levels of aggregation are described in the English language.

Several respondents from the Ministry, including Chiefs of Departments and National Directors, are not aware of the accessibility of EMIS data through the Ministry’s website. Respondents indicated that they receive EMIS data, but only by submitting a request to DNPPMA. Since the website publishes data and indicators aggregated by municipality, Ministry departments cannot use the spreadsheets for the planning of the allocation of resources to the school level, including the planning of budgets for the school grants and school feeding programme.

EMIS data can be accessed by the public, examples include UIS and organisations supporting the implementation of education programmes, such as HANDS, ALMA, and HATUTAN. Since 2016 UNICEF has supported the Ministry of Education, Youth and Sport with the development of a two-page SDG 4 country profile, mostly using EMIS data.

EMIS data are not shared with municipality education offices. The EMIS official that was interviewed showed how he created a parallel dataset, based on the submission of unverified data from schools in January and February. The official enters all data in Excel in order to meet requests for data from other sections in the Ministry, the local municipality administration, or from visiting (national) organisations.

3.1.2 Recommendations (2.01)

1. **Recommendation 2.01.1:** EMIS data required by schools, the public, and municipalities should be printed in hardcopy format or available on media in Excel spreadsheets and analytical documents annually for distribution to communities and consumption by municipalities. This should be done until such time as municipalities and communities are able to reliably and cost-affordably access the internet.

2. **Recommendation 2.01.2:** EMIS data access and use should be surveyed annually at municipal, school, and public level, and changes to the distribution of hardcopy data should be adjusted based on the survey results.

3. **Recommendation 2.01.3:** A communication strategy to engage the media and other outlets in the receipt and publishing of EMIS data should be developed. The media can play a strong role in ensuring the public have access to information on their local schools.

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99 HANDS (Halimar Aprende no Deskobre Susesu) is a Ministry-led pre-school education programme, supported by the New Zealand Government.

100 ALMA (Apoio, Lideransa liu hosí Mentoria no Aprendizajen) is a primary education programme, supported by the Australian Government.

101 HATUTAN (Hahán ne’ëbe Atu fo Tului ho Nutrisaun no Edukasaun) is a programme implemented by CARE International and supported by the United States Agency for International Development, to continue to support nutrition for education.

102 A. de Araujo Modasi, interviewed on 20 March 2019.
4. **Recommendation 2.01.4:** As part of the full requirements analysis, assess internet connectivity solutions at the sub-national level as well as at the school level, at least for central schools for basic education, and in the long term for all schools.

5. **Recommendation 2.01.5:** Develop a partnership with one of the private telecommunication companies and negotiate an affordable internet access solution.

6. **Recommendation 2.01.6:** Develop an interface so that directorates, municipality offices, and schools can access disaggregated data, enhancing data relevance for micro-level planning.

7. **Recommendation 2.01.7:** Translate the EMIS website into Portuguese and widely share the URL to encourage use.

8. **Recommendation 2.01.8:** Develop in-service training modules for municipal- and national-level planners and administrators to help train them to be more effective in utilising EMIS data for decision-making.

Implementing these recommendations will result in enhanced access to EMIS data, while disaggregation of data will increase the relevance of the data for use, a prerequisite for departments, municipality offices, and schools to start using EMIS data for making school improvements and supporting vulnerable groups.

### 3.2 (2.02) How are the EMIS data interpreted, analysed, presented, and consumed for decision-making and policy implementation?

#### 3.2.1 Main findings

EMIS data are interpreted and analysed every year, following completion of the data collection and verification. The EMIS Department then shares the dataset with DNPPMA. The EMIS Department calculates key indicators, such as the NER, GER, and publishes these on the website. These indicators are aggregated by municipality level and a few disparity indicators, including gender.

Until 2015, the EMIS Department produced the annual Education Data Books, the successor of the Statistical Year Book, development of which was technically and financially supported by UNICEF from 2008 until 2013. The Data Books included detailed analyses, aggregated by municipality level. The Books were not widely disseminated. There is an intention to start producing these year-books again in 2019, indicated in the annual budget plan of DNPPMA.

Data are not analysed to the extent that key indicators can be compared between disadvantaged groups, such as children with disabilities. The Director of DNPPMA does not conduct further analyses and indicated that external expertise is hired if complex analyses are needed.

Upon receiving EMS data, DNPPMA further shares data, on request from other Ministry departments or external stakeholders. Examples include UIS, which supports the Ministry with the monitoring of global education indicators. DNPPMA also reports data to the National Statistics Office and UPMA.

Directorates use data primarily for the planning of allocation of resources, such as school grants, the budget for the school feeding programme, the procurement of school furniture, and infrastructure planning. Data are not frequently used by the Ministry of Education, Youth and Sport to conduct in-depth analyses of the education sector, to monitor plans, or to inform policy. Interviewed senior Ministry staff (Director-Generals and senior advisors) identified a lack of capacity at the Ministry as the main constraint on a more extensive use of data. An interviewed advisor emphasised the need to develop basic analytical skills among decision makers, so they can interpret indicators and use them to inform policy development.

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103 Refer to Section 1.11.

104 A. de Jesus, interviewed on 13 March 2019.


106 A. de Jesus and A. Pires, interviewed on 13 March 2019.

As an illustrative case, some senior decision makers at the Ministry were not aware that the EMIS Department collects data on disability. One Chief of Department indicated a general awareness that the EMIS collects a lot of data but is not aware of the type of data that are available. The EMIS Department itself also underlines the importance for Directors to be better informed about the data and indicators, as a prerequisite for using data. The Chief of the EMIS Department suggested that an annual seminar to disseminate and explain indicators will increase awareness of the data, as an important step for the Ministry to increase the use of data. The National Department for Inclusive Education explained that it is aware of the individual EMIS data on disability, but that it has little confidence in the accuracy of these data and therefore does not use the data for decision-making and policy development.

Development partners supporting education programmes such as ALMA and HANDS use EMIS data to populate digital pre-school inspection forms and classroom observation forms. When using these forms, pre-school inspectors report on irregularities of data, such as teachers that appear not to be in the EMIS database, schools that have changed their names, etc.

3.2.2 Recommendations (2.02)

1. **Recommendation 2.02.1:** The EMIS Department should hold an annual presentation of data and indicators for Ministry departments, including a capacity development component on how to interpret and use indicators for decision-making – in particular, preparing annual workplans and budgets.

2. **Recommendation 2.02.2:** Develop an interface that lets departments, municipality offices, and schools directly access disaggregated data by school (refer to Recommendation 2.01.6), including school, WASH, state of classrooms, access to water, etc.

3. **Recommendation 2.02.3:** Create a feedback loop with the interface, enabling departments to contribute to data verification, resulting in enhanced accuracy, timeliness, and credibility of the EMIS data.

4. **Recommendation 2.02.4:** The interface (refer to Recommendation 2.01.6) should present data and indicators in a format that facilitates understanding, including charts and explanatory diagrams.

As noted above (Recommendation 2.01.8), in-service training modules for education managers and administrators at municipal level and national level should be developed and implemented.

The Ministry is increasingly becoming aware of the potential of accurate data for decision-making. The proposed recommendations will help the Ministry to develop its technical capacity to capitalise on this increased awareness. It is important that the proposed data specialist/capacity development specialist facilitates this learning process by taking small steps, by developing in-service learning packages, on-the-job support, and developing interventions that make it impossible for departments not to use data for decision-making.

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109  P. Gomes, interviewed on 11 March 2019.
110  J. Monteiro, interviewed on 13 March 2019.
3.3 (2.03) How are the EMIS data used to improve/influence the implementation of sub-national education plans at district and school levels?

3.3.1 Main findings
Planning activities in the sector are highly centralised and the capacity to use data for decision-making at municipality levels and schools is limited. Furthermore, access to EMIS data at sub-national level is limited, for reasons that were observed earlier, and there is no evidence that municipalities use individual school data through the EMIS to help identify school planning resourcing needs and to monitor plans. There is also no evidence that EMIS data are used to improve and influence the implementation of sub-national education plans or school plans.

3.3.2 Recommendations (2.03)
Other recommendations in this report call for the review of municipality reporting requirements and for the implementation of improved methods of distributing information to municipality offices. Considering the limited experience of processing data and information throughout the Ministry of Education, Youth and Sports, the utilisation of data for sub-national planning should be encouraged by preparing information that is tailored to the needs and capacity levels of sub-national actors.

1. **Recommendation 2.03.1:** Municipality offices and schools should receive an annual report containing official and relevant data, presented in a way that intended users of the information can understand, as a first step towards improving the implementation of plans.

2. **Recommendation 2.03.2:** The reports that municipality offices receive should let schools and municipality offices compare some performance indicators between Municipalities. These could be teacher/student ratios, average class sizes, key indicators related to school infrastructure, OOSC, etc.

3. **Recommendation 2.03.3:** Enhance the access to individual school data by developing a school portal, and develop the capacity of Education Directors to start using data and indicators as an input for school development planning.

4. **Recommendation 2.03.4:** Support equipment materials (ICT) and capacity building for education municipality staff on the access to data, the analysis, and the use for decision-making

3.4 (2.04) How does the EMIS facilitate daily transactions for operational requirements?

3.4.1 Main findings
**Student transfers**
Schools are instructed to use a student transfer form when a student migrates from one school to another. If schools comply with the procedure the EMIS official receives a completed transfer form that includes two parts: the first part is completed by the school that the student has left, and the student must bring the half-completed form to the new school, which completes the second part of the form. In this way, duplication of students (e.g. new registration of the same person) can be avoided. The EMIS official receives the completed form and forwards it to the EMIS Department, which updates the system.

However, in practice, actors do not always comply with these procedures. Parents do not consistently notify the school when they move to a new place, and there are cases where schools keep the student in the system in order to maintain the student numbers.

Data are updated to the EMIS annually, so student transfers are not recorded in the EMIS until the end of the
academic year, and then data are only accessible centrally through the EMIS Department.

**Teacher transfers**

State-paid teachers are managed by the PMIS. If a teacher is transferred, municipality offices notify relevant directorates including Primary Education, Basic Education, Secondary Education, which, in turn, notify the Directorate of Human Resources. The Department of PMIS under the Directorate makes the necessary changes to the PMIS. However, these changes are not always forwarded to the EMIS Department. The EMIS Department, as observed earlier, also keeps a record of state-paid teachers. These updates will not take place until the data on teachers are collected using the annual teacher form at the start of the school year.

**Schools**

Similar to the transfer of teachers, the EMIS Department is notified by the National Directorates if a new school needs to be added to the database. The EMIS Department then provides the school with a unique (EMIS) number.

### 3.4.2 Recommendations (2.04)

Previous recommendations call for piloting the decentralisation of data management to schools or municipalities (where feasible). With the correct procedures in place, this would enable closer to real-time data management of student data.

1. **Recommendation 2.04.0:** The previously recommended integration of the EMIS and PMIS databases would generate uniform, consolidated data on state-paid teachers throughout the Ministry of Education, Youth and Sport. The processes for reporting on teacher transfers, and possibly additional variables, must be reviewed so that it is clear how different systems can be updated automatically and how departments use consolidated data.

2. **Recommendation 2.04.1:** Schools should follow set procedures to report on student transfers. This will help reduce the duplication of students. Quality assurance mechanisms, including guiding manuals and legislation, need to be developed in order to ensure schools comply with the procedures. Student transfers should be entered into the EMIS as they occur.

### 3.5 (2.05) How does the EMIS operate with various systems and functions, e.g. student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards)?

#### 3.5.1 Main findings

Data on the academic status of students is updated once every year. There is no real-time monitoring of students, such as monitoring of student attendance or monitoring of student achievements other than students being promoted to subsequent grades or having completed a school level. Attendance and individual grade scores are not recorded and there are no early warning mechanisms for identifying potential dropouts utilising EMIS. Consequently, there are no feedback loops provided for individual students. Participants at the validation workshop reported the absence of a coordinating line between the Ministry of Education, Youth and Sport and municipality offices and schools to facilitate feedback loops.
3.5.2 Recommendations (2.05)

1. **Recommendation 2.05.1:** Investigate whether a review of the EMIS can result in monitoring school attendance and student achievements. Alternatively, school inspectors can monitor student attendance by conducting headcounts, the results of which can be compared with the official EMIS student enrolment numbers.

2. **Recommendation 2.05.2:** Develop a pilot project to monitor attendance and academic achievement for pupils and to provide early warning for potential dropouts.

3. **Recommendation 2.05.3:** Develop coordination mechanisms between the Ministry, municipality offices, and schools, including communication mechanisms, such as emails or WhatsApp, or alternative solutions.

3.6 (2.06) How is the EMIS used, if at all, to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers)?

3.6.1 Main findings

EMIS data are used centrally for the allocation of resources, infrastructure planning, the procurement of school furniture, and assessment of school grants (including the school feeding programme). Directorates request DNPPMA to provide data on the number of schools and students so that resource allocation can be planned school by school. Most allocation of resources is based on student numbers, which, as elaborated previously, are based on individually recorded student data.

The Departments of School Social Action, Basic Education, and Finance (Budget Plan) use the number of schools, teachers, and students to ensure the distribution and allocation of resources is done in an equitable way. Similarly, the Directorate of Infrastructure uses the EMIS data to plan the construction of classrooms and school buildings. Although the data themselves are sufficient, directorates expressed the importance of receiving (verified) data at an earlier stage so that updated numbers can be used for annual action planning. Normally, the EMIS Department finalises the verification in June, only shortly before the Ministry of Education, Youth and Sport has to submit its annual budget plan in July.

3.6.2 Recommendations (2.06)

1. **Recommendation 2.06.1:** The previously recommended school-level data entry should result in a shorter data collection and verification cycle. This would help departments to submit their annual budgetary plans in a timely fashion, and better aligned with the Government’s annual budgetary planning cycle.
3.7 (2.07) What are some key requirements and issues to consider in order to ensure better collection, analysis, and utilisation of the EMIS data?

3.7.1 Main findings

**Improving the collection of data**

The decentralisation of data entry to the central basic education level will enhance the timeliness of data and open up the door to real-time monitoring of data, including monitoring of student attendance and teacher absenteeism. The decentralisation of data entry will enable the EMIS Department to monitor and verify the collection of data, resulting in enhanced accuracy and timely submission of data. The decentralisation and digitalisation of data collection will help transform the EMIS, from the current, static system towards an evolving and dynamic system that can respond to changing needs for data from the Ministry of Education, Youth and Sport. It will also help engage actors at the school and municipal level in the EMIS, which will help improve the timeliness and quality of the EMIS data.

**Improving the analysis of data**

Currently, the Ministry has no data specialist who is tasked with conducting in-depth analyses and responding to emerging needs for information within the Ministry. The EMIS Department conducts such analyses; however, its main responsibility should be to collect, verify, and clean data.

**Improving the utilisation of data**

Similar to the analysis of data, the utilisation of data will increase if a data specialist with capacity development skills can work alongside decision makers in the Ministry of Education, Youth and Sport to expand the utilisation beyond the planning for the allocation of resources. Such a specialist can provide in-service training and explain how indicators can be used for decision-making, policy development, annual action planning, and for targeted interventions that enhance equitable access to schools and support vulnerable groups. This unit (a person or small organisational unit) can be tasked with preparing in-service training packages for Director-Generals, National and Municipality Directors, as well as Chiefs of Department. The unit can also prepare visual reports tailored to the information needs of directorates, that can help them monitor the performance of schools, compare performance between municipalities, and use the information as a foundation to support municipality offices with the management of schools.

In conclusion, the Ministry of Education, Youth and Sport requires a data and capacity development expert who can link the information needs of the Ministry and the data that are collected.

3.7.2 Recommendations (2.07)

Previous recommendations address many of the issues concerning decentralisation, data analysis, and use.

1. **Recommendation 2.07.1:** The Ministry of Education, Youth and Sport should recruit a data and capacity development specialist who can drive the development of the EMIS, and the analysis and utilisation of data.
Review of EMIS that track individual student data: Timor-Leste
Annex A

Bibliography


UIS (2016a) ‘Country readiness to monitor SDG 4 education targets: Regional survey for the Arab States’, UIS.

UIS (2016b) ‘Country readiness to monitor SDG 4 education targets: Regional survey for the Asia and Pacific region’, UIS.


### Annex B

**Persons interviewed**

The following persons were consulted as part of this research.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Department/institution/organisation</th>
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<tbody>
<tr>
<td>Mr Antoninho Pires</td>
<td>Director General of Planning, Policy and Partnership</td>
<td>Ministry of Education, Youth and Sport</td>
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<tr>
<td>Mr Cidalio Leite</td>
<td>Director General of Recurrent, Primary and Basic Education</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Evaristo Maria de Jesus</td>
<td>Inspector General of Education</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Mauricio dos Reis Martins</td>
<td>Deputy Inspector General</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Antonio de Jesus</td>
<td>National Director of Policy, Planning, Monitoring and Evaluation</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Manuel Gomes de Araujo</td>
<td>National Director of Secondary Education</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Manuel Monteiru</td>
<td>National Director of Finance</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>Department/institution/organisation</td>
</tr>
<tr>
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</tr>
<tr>
<td>Mr Paulino Gomes</td>
<td>Chief of EMIS Department</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Fernando Paixote</td>
<td>Chief of PMIS Department</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Marito Vicente da Costa</td>
<td>Chief of Department of Basic Education</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Hermenegildo M. Gomes</td>
<td>Chief of Legal Cabinet</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Jose Monteiro</td>
<td>Chief of Inclusive Education Department</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mrs Delia Borges</td>
<td>Supervisor Data Entry</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Afonso Soares</td>
<td>Former Director of Planning, Monitoring and Evaluation</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Simao do Rosario</td>
<td>Former Chief of EMIS Department</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Titu Conceicao</td>
<td>Former Data Entry Specialist</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Justino Marin</td>
<td>Advisor to the Minister</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mrs Debbie Katzman</td>
<td>Advisor to the Minister</td>
<td>Ministry of Education, Youth and Sport</td>
</tr>
<tr>
<td>Mr Zilto de Oliveira</td>
<td>Director of Education Office</td>
<td>Municipality Education Office, Liquica</td>
</tr>
<tr>
<td>Mr Alberto de Araujo Modasi</td>
<td>EMIS focal point</td>
<td>Municipality Education Office, Liquica</td>
</tr>
<tr>
<td>Mr Geraldo Ribeiro Soares</td>
<td>School Director</td>
<td>Cassait Basic Education School</td>
</tr>
<tr>
<td>Mr Cesar Melito Martins</td>
<td>National Statistics Office</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>Mrs Leotes Helin</td>
<td>Chief of Education</td>
<td>UNICEF Timor-Leste</td>
</tr>
<tr>
<td>Mr Vicente T. Lopes</td>
<td>Education Officer</td>
<td>UNICEF Timor-Leste</td>
</tr>
<tr>
<td>Mr Joao da Costa</td>
<td>M&amp;E Officer</td>
<td>UNICEF Timor-Leste</td>
</tr>
<tr>
<td>Mr Javier Luque</td>
<td>Senior Education Specialist</td>
<td>World Bank</td>
</tr>
<tr>
<td>Mrs Adelaide G.N. De Camoes</td>
<td>Education Specialist</td>
<td>World Bank</td>
</tr>
<tr>
<td>Mrs Nicole Seibel</td>
<td>Chief of Party</td>
<td>CARE International</td>
</tr>
<tr>
<td>Mrs Agnes Neraw</td>
<td>Lafaek Management Advisor</td>
<td>CARE International</td>
</tr>
<tr>
<td>Mr David Letichevsky</td>
<td>Senior Education Specialist</td>
<td>Catalpa International</td>
</tr>
<tr>
<td>Mr Kashif Saeed</td>
<td>Former technical advisor to EMIS</td>
<td>World Bank</td>
</tr>
</tbody>
</table>
Annex C

Organisational structure in relation to EMIS (Eighth Constitutional Government)

Figure 13. Organisational structure of the Ministry of Education, Youth and Sport

Minister
Vice-Minister

General Inspectorate of Education

General Directorate
Administration and Finance
- National Directorate Human Resources
- National Directorate Finance and Administration
- National Directorate Procurement
- National Directorate School Social Services
- National Directorate IT, Logistics, Inventory

General Directorate
Planning, Policy, Inclusivity
- National Directorate Planning and Inclusive Educ.
- National Directorate Infrastructure
- National Directorate Electronic and Library

General Directorate
Pre-school, Basic and Non-formal Ed.
- National Directorate Pre-school Education
- National Directorate Basic Education
- National Directorate Non-formal Education

General Directorate
Secondary Education
- National Directorate General Sec. Education
- National Directorate Technical / Vocational

INFORDEPE
Teacher Training

Cabinet of legal advisory
Printing centre
Unidade Curriculum Nacional
Cabinet Protocol and Cooperation

Municipality Education Offices

National Commission for Education
School Director Advisory Board
Coordination Board

National Directorate
Human Resources

National Directorate
Finance and Administration

National Directorate
Procurement

National Directorate
School Social Services

National Directorate
IT, Logistics, Inventory

National Directorate
Planning and Inclusive Educ.

National Directorate
Infrastructure

National Directorate
Electronic and Library

National Directorate
Pre-school Education

National Directorate
Basic Education

National Directorate
Non-formal Education

General Inspectorate of Education
A research rubric is provided below to enable scaled comparisons between countries along different research themes and is presented below.

Table 10. Rubric for summary comparison of the review

<table>
<thead>
<tr>
<th>SN</th>
<th>Research question</th>
<th>Latent</th>
<th>Emerging</th>
<th>Established</th>
<th>Advanced</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Strategic areas: policy and data gaps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.01</td>
<td>Does the country have a strategic plan to strengthen the EMIS?</td>
<td>No strategic plan currently exists.</td>
<td>A strategic plan exists, produced in 2011, but implementation is not monitored. The EMIS lacks a dedicated strategy.</td>
<td>Strategic plans exist and are being followed but there are areas of quality, coordination, or implementation requiring improvement.</td>
<td>Strategic plans exist and guide the EMIS.</td>
<td>None</td>
</tr>
<tr>
<td>1.02</td>
<td>Does the EMIS collect and analyse data that are necessary and sufficient to monitor and develop the national education policy framework and sector plan?</td>
<td>The EMIS does not collect and analyse data for monitoring and development of the national education policy framework and sector plan.</td>
<td>The EMIS collects and analyses data that has the potential to be used for monitoring the strategic plan. However, limited capacity to utilise data prevents this from happening. There are data gaps (e.g. non-formal education) and quality issues (e.g. accuracy).</td>
<td>The EMIS does collect and analyse data for most monitoring and development of the national education policy framework and sector plan but there are some gaps and issues (quality, sector etc.).</td>
<td>The EMIS does collect and analyse data for all monitoring and development of the national education policy framework and sector plan, and facilitates timely and quality monitoring and analysis.</td>
<td>None</td>
</tr>
<tr>
<td>1.03</td>
<td>Does the EMIS collect and analyse data required for the monitoring of SDG targets and indicators?</td>
<td>The EMIS does not collect and analyse data for the SDG targets and indicators and there is presently no mapping.</td>
<td>The EMIS does collect relevant data but the Ministry itself does not analyse data for the SDG targets. Mapping of data to indicators is in the process of being carried out.</td>
<td>The EMIS does collect and analyse data for most SDG targets for which the EMIS can provide information and indicators, and there is mapping and a plan to ensure full coverage.</td>
<td>The EMIS does collect and analyse data for all SDG targets for which EMIS can provide information and indicators, and there is presently mapping.</td>
<td>None</td>
</tr>
<tr>
<td>SN</td>
<td>Research question</td>
<td>Latent</td>
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<td>Established</td>
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<tr>
<td>1.04</td>
<td>To what extent does the EMIS capture data and information in ways that allow for equity analysis, such as enrolment/attendance of children with disabilities, children from ethnic minority communities, and children from poor households?</td>
<td>The EMIS does not disaggregate by equity parameters: regional, ethnicity, wealth, gender, disability, language etc.</td>
<td>The EMIS has data that can be disaggregated by equity parameters, including gender, socioeconomic background, disability status, and mother tongue.</td>
<td>The EMIS does disaggregate by most parameters of equity parameters: regional, ethnicity, wealth, gender, disability, language etc.</td>
<td>The EMIS does disaggregate by all parameters of equity parameters: regional, ethnicity, wealth, gender, disability, language etc.</td>
<td>None</td>
</tr>
<tr>
<td>1.05</td>
<td>How, if at all, does the EMIS address issues around OOSC (including children at risk of dropping out)?</td>
<td>The EMIS is not used to address issues of OOSC or those at risk of dropping out.</td>
<td>The EMIS can be used to address issues of OOSC or those at risk of dropping out; however, there are no mechanisms in the Ministry to act upon findings and reports.</td>
<td>The EMIS is used to address issues of OOSC or those at risk of dropping out but there are some gaps, disaggregation, and quality issues.</td>
<td>The EMIS is used to address issues of OOSC or those at risk of dropping out, on a regular basis.</td>
<td>None</td>
</tr>
<tr>
<td>1.06</td>
<td>What are the various aspects that contribute to the quality of the EMIS?</td>
<td>EMIS data fitness for analysis – relevance, accuracy, completeness, recency, and cleanliness – are poor.</td>
<td>EMIS data fitness for analysis – relevance, accuracy, completeness, recency, and cleanliness – have significant issues.</td>
<td>EMIS data are highly relevant and likely complete and have good coverage but there are suspected and confirmed accuracy issues that need to be investigated and resolved.</td>
<td>EMIS data fitness for analysis – relevance, accuracy, completeness, recency, and cleanliness – is good.</td>
<td>None</td>
</tr>
<tr>
<td>SN</td>
<td>Research question</td>
<td>Latent</td>
<td>Emerging</td>
<td>Established</td>
<td>Advanced</td>
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<tr>
<td>1.07</td>
<td>What quality assurance processes are in place and how effective are they?</td>
<td>Some verification takes place, but there are few validation mechanisms in the software or otherwise. There is an absence of a systematic methodology for verification and guiding manuals and teachers are not trained to undertake verification.</td>
<td>Some quality control processes – such as validation, triangulation, and verification – but applied inconsistently.</td>
<td>Good quality control processes are implemented, such as validation, triangulation, and verification, and are applied consistently and transparently.</td>
<td>Good quality control processes are implemented, such as validation, triangulation, and verification, and are applied consistently and transparently.</td>
<td>None</td>
</tr>
<tr>
<td>1.08</td>
<td>How does the EMIS protect the data privacy of students and teachers?</td>
<td>There are no policies or legislation concerning the protection of privacy of data or utilisation of data. Protection is based on ‘common sense’.</td>
<td>There are policies or legislation concerning privacy but they are not enforced for data on individuals.</td>
<td>There are policies or legislation concerning privacy which are usually enforced for data on individuals; however, this hampers necessary data analysis and publication.</td>
<td>There are policies or legislation concerning privacy which are enforced for data on individuals, and this does not affect required analysis and publication.</td>
<td>None</td>
</tr>
<tr>
<td>1.09</td>
<td>How does the EMIS interact, if at all, with other administrative data systems (e.g. health, social welfare, civil registry, labour)?</td>
<td>The EMIS stands alone and does not derive any information from any other systems, other than inconsistent paper trails from the PMIS.</td>
<td>EMIS interoperability with other data systems is limited. There are no standards which govern information on entities such as individuals and assets.</td>
<td>The EMIS has some interoperability with other systems based on common data standards for entities such as individuals and assets.</td>
<td>Interoperability between the EMIS and other government data systems is extensive and based on common data standards.</td>
<td>None</td>
</tr>
<tr>
<td>1.10</td>
<td>How is the EMIS managed and where is it situated in the data architecture or statistical systems of the country?</td>
<td>The EMIS is centralised and isolated in an EMIS department or equivalent. Some aggregated data and indicators are publicly accessible through the Ministry’s website.</td>
<td>Centrally hosted and some access granted to national stakeholders but limited access outside the central Ministry of Education, Youth and Sport.</td>
<td>Access and data management at the provincial and district levels.</td>
<td>Fully decentralised for data entry and management at the school level.</td>
<td>None</td>
</tr>
</tbody>
</table>
### SN | Research question | Latent | Emerging | Established | Advanced | Comment
---|---|---|---|---|---|---
### 1.11 | Are sufficient resources (human and financial) available for the EMIS? | The EMIS is allocated insufficient resources for training and is allocated small funds for data verification. | The EMIS is operational but lacks funds for development or some aspects of operation, which impacts on its operation. | The EMIS is well resourced but there are some areas which could have improved resources development or some aspects of operation. | The EMIS is well resourced, with adequate funds for operation and further development to address any issues. | None
### 1.12 | Is there an annual budget allocation to improve the EMIS? | There is no budget allocation (development budget) for the improvement of the EMIS. | There is a budget allocated but it is insufficient to ensure the required development and/or is applied inconsistently. | A budget is allocated and ensures most improvements to the EMIS that are required are undertaken. | A budget is allocated consistently through a systematic process of analysis of requirements and costing on an annual basis. | None
### 1.13 | ADDED Do parents and teachers have access to EMIS data and do these data result in improved pedagogical outcomes? | Parents and teachers have no access to EMIS data and there is little evidence that the EMIS data contributes to pedagogical outcomes. | Parents and teachers have access to EMIS data through the school to a limited extent, such as through raw examination results for key exam points. | Parents and teachers have good access to EMIS data through electronic report cards or school report cards or other means. They are aware of how to access and interpret this information. | Parents and teachers have extensive access to EMIS data and are able to feedback comments. The EMIS facilitates communication between teachers and parents and students. | Internet capacity at schools and municipal offices is weak or non-existent.
### 1.14 | ADDED What were the key drivers, processes, challenges, and costs of the transition from aggregate data systems to individual child systems? | The processes were not recorded and institutional knowledge is no longer available. | There were some barriers to transition. There may have been some challenges to funding and many issues were encountered but were overcome during transition. | There were few barriers to transition. Transition was planned and budgeted; however, there were still some challenges encountered during transition. | Transition was carefully planned, budgeted and capacity developed appropriately. Very few issues were encountered and these were managed with contingency planning or rapid action. | None
<table>
<thead>
<tr>
<th>SN</th>
<th>Research question</th>
<th>Latent</th>
<th>Emerging</th>
<th>Established</th>
<th>Advanced</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>Strategic area: data analysis and utilisation</td>
<td></td>
<td></td>
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<tr>
<td>2.01</td>
<td>To what extent are the EMIS data accessible to intended ministries and the public?</td>
<td>EMIS data are inaccessible to external stakeholders and are only published in aggregate regional or national figures.</td>
<td>Some aggregated data and indicators are available on the Ministry’s website. The website is not in an official language and is barely used. Data are mostly shared on request.</td>
<td>The public and other stakeholders have access to EMIS data at regional, national, and individual institution levels in most sectors.</td>
<td>The public and other stakeholders have access to EMIS data at regional, national, and individual institution level in all sectors and in formats which help inform stakeholders as to the progress of individual institutions.</td>
<td>None</td>
</tr>
<tr>
<td>2.02</td>
<td>How are the EMIS data interpreted, analysed, presented, and consumed for decision-making and policy implementation?</td>
<td>EMIS data are only published in raw or aggregate format. They are not analysed. Their use in policy implementation is limited.</td>
<td>EMIS data are analysed and presented as indicators and figures to municipal level but are not used extensively at all levels of government.</td>
<td>EMIS data are analysed and narrated and used extensively in policy implementation at all levels of government.</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>2.03</td>
<td>How are the EMIS data used to improve/influence implementation of sub-national education plans at district and school levels?</td>
<td>EMIS data are not used for sub-national planning or in schools other than central planning of resource allocation.</td>
<td>EMIS data are used for some sub-national planning but not in schools.</td>
<td>EMIS data are used for sub-national planning and in schools.</td>
<td>EMIS data are used extensively in sub-national planning and in schools, including school development planning and access by the school committee or equivalent.</td>
<td>None</td>
</tr>
<tr>
<td>2.04</td>
<td>How does the EMIS facilitate daily transactions for operational requirements?</td>
<td>The EMIS is not used for daily transactions and operational requirements: it simply reports statistics.</td>
<td>The EMIS is used for some non-routine transactions in response to data requests from Ministry departments and stakeholders.</td>
<td>The EMIS encompasses operational systems, such as a human resources information system, and they are integrated with the EMIS and used often.</td>
<td>The EMIS ecosystem of systems is well integrated and contains little data redundancy, and operational systems are used extensively.</td>
<td>None</td>
</tr>
<tr>
<td>SN</td>
<td>Research question</td>
<td>Latent</td>
<td>Emerging</td>
<td>Established</td>
<td>Advanced</td>
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<tr>
<td>2.05</td>
<td>How does the EMIS operate with various systems and functions, e.g. student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards)?</td>
<td>The EMIS does not operate with system and functions such as student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards).</td>
<td>The EMIS has limited operation with system functions, e.g. student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards).</td>
<td>The EMIS has good operation with system functions, e.g. student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards).</td>
<td>The EMIS has extensive operation with system functions, e.g. student tracking (students’ movement, transition, transfer etc.), real-time monitoring (attendance, academic progress etc.), early warning (dropout prevention, learning improvement etc.), and automated reporting with data visualisation, feedback loops (e.g. school report cards).</td>
<td>EMIS data are input or updated annually and not continuously.</td>
</tr>
<tr>
<td>2.06</td>
<td>How is the EMIS used, if at all, to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers)?</td>
<td>The EMIS is not used to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers etc.).</td>
<td>The EMIS is sometimes used to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers etc.) through non-routine analysis.</td>
<td>The EMIS is often used to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers etc.) through non-routine analysis and routine use.</td>
<td>The EMIS is used extensively to help ensure equitable distribution and allocation of resources (e.g. school grants, teachers etc.) through non-routine analysis and routine use.</td>
<td>The EMIS is not used to track grant allocation.</td>
</tr>
<tr>
<td>2.07</td>
<td>What are some key requirements and issues to consider in order to ensure better collection, analysis, and utilisation of the EMIS data?</td>
<td>Extensive requirements to consider improving the EMIS. Foremost is ensuring access to the EMIS and EMIS data at municipal or even school level.</td>
<td>Some requirements to consider in order to improve the EMIS, particularly at district and school levels.</td>
<td>A few requirements to consider to improve the EMIS but the EMIS is used at all levels.</td>
<td>The EMIS is optimally deployed. Data are presented in an appropriate format and used routinely at all levels.</td>
<td>3G access is pervasive and reasonably cost-effective throughout Timor-Leste and could facilitate decentralisation of EMIS access and use.</td>
</tr>
</tbody>
</table>
SDG 4 is the most relevant SDG for the education sector. SDG 4 is formulated as follows: ‘To ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. By 2030.’

This goal is achieved when 10 targets are met. Seven targets are direct outcome targets and the final three targets contribute to achieving outcome targets:

### Table 11. 10 targets of SDG 4

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Type of target</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>Free, equitable, and quality primary and secondary education for all girls and boys by 2030</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.2</td>
<td>Quality early childhood development, care, and pre-primary education</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.3</td>
<td>Quality technical and vocational education and training and tertiary education</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.4</td>
<td>Technical and vocational skills</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.5</td>
<td>Equal access to all levels of education and training for the vulnerable</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.6</td>
<td>Youth and adult literacy and numeracy</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.7</td>
<td>Knowledge and skills needed to promote sustainable development</td>
<td>Outcome target</td>
</tr>
<tr>
<td>4.a</td>
<td>School environment</td>
<td>Means to achieve outcome</td>
</tr>
<tr>
<td>4.4</td>
<td>Scholarships</td>
<td>Means to achieve outcome</td>
</tr>
<tr>
<td>4.c</td>
<td>Qualified teachers</td>
<td>Means to achieve outcome</td>
</tr>
</tbody>
</table>

Targets are needed to measure if the goal of SDG 4 has been achieved, and indicators are needed to monitor progress towards achieving a target. For SDG 4, 11 global indicators were formulated; these indicators, which are set out in the table below, are used to monitor the progress towards achieving SDG 4 targets. (The table also explains which data sources can be used as a source to measure progress towards achieving the SDG 4 targets. Sections in bold font in the third column explicitly or implicitly refer to the EMIS as a source of data to monitor the SDG 4 indicators.)

### Table 12. Global indicators under SDG 4

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.1</td>
<td>Proportion of children/young people with at least a minimum proficiency level (MPL) in reading and mathematics, by sex (at Grades 2 or 3; at end of first and at the end of lower secondary education)</td>
<td>Cross-national learning assessments: PASEC, PIRLS, PISA, SEA-PLM, etc.</td>
</tr>
<tr>
<td>4.2.1</td>
<td>Proportion of children under five years who are on track in health, learning, and psychological well-being, by sex. So they are ready for primary education</td>
<td>Various measures, e.g. MICS ECD Index etc.</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Participation rate in organised learning (one year before the official primary entry age), by sex</td>
<td>Enrolment data (EMIS), national statistical offices, household surveys</td>
</tr>
<tr>
<td>4.3.1</td>
<td>Participation rate of youth and adults in formal and non-formal education and training in the previous months, by sex</td>
<td>International Labour Organization School-to-Work Transition Survey (SWTS), etc.</td>
</tr>
<tr>
<td>4.4.1</td>
<td>Proportion of youth and adults with ICT skills, by type of skills</td>
<td>Eurostat / ITU</td>
</tr>
</tbody>
</table>
Some SDGs are mentioned in the Ministry’s 2019 budget plan, including SDG 4 (Education), SDG 5 (Gender Equality), and SDG 16 (Peace, Justice and Strong Institutions.) Targets and global indicators are not explicitly referred to in policy and strategic documentation.

<table>
<thead>
<tr>
<th>Reference to target</th>
<th>Description</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5.1</td>
<td>Parity indices (female/male, rural/urban, bottom/top wealth quintile, disability, indigenous, etc.) for all education indicators on this list that can be disaggregated. (Parity index: the indicator value of the likely more disadvantaged group divided by the indicator value of the other sub-population of interest (p. 33))</td>
<td>Disaggregated data. Parity indices should be between 0.97 and 1.03</td>
</tr>
<tr>
<td>4.6.1</td>
<td>Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex</td>
<td>Programme for the International Assessment of Adult Competencies (PIAAC), Literacy Assessment and Monitoring Programme (LAMP)</td>
</tr>
<tr>
<td>4.7.1</td>
<td>Extent to which global citizenship education and education for sustainable development, including gender equality and human rights, are mainstreamed in policies, curriculum, teacher education.</td>
<td>Annual UNESCO questionnaire</td>
</tr>
<tr>
<td>4.a.1</td>
<td>Proportion of schools with access to electricity, internet, computers, infrastructure for disabilities, drinking water, single-sex sanitation, and hand-washing</td>
<td>Administrative data from schools</td>
</tr>
<tr>
<td>4.b.1</td>
<td>Volume of official development assistance flows for scholarships by sector and type of study</td>
<td>Administrative data</td>
</tr>
</tbody>
</table>
| 4.c.1               | Proportion of teacher in pre-primary, lower secondary, upper secondary who received at least the minimum organised teacher training pre-service or in-service required for teaching in a country, by sex | Administrative data from schools and other organised learning centres
## Hardware and operating systems used for the EMIS

### Table 13. Hardware and software used for the EMIS

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Operating system</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMIS server</td>
<td>• Server processor: Intel® Xeon® CPU E5405 @2.00GHz with 4GB RAM and 72 GB HDD. Operating system: Windows Standard Server 2007. &lt;br&gt;• SQL Server: 2008 (SP1) – 10.0.2531.0 (64 bit)</td>
<td>Windows Standard Server 2007</td>
<td>1</td>
</tr>
<tr>
<td>Pre-school server</td>
<td>• Server processor: Intel® Xeon® CPU E5-25600 @2.00GHz with 16GB RAM and 2 TB HDD. &lt;br&gt;• SQL Server: 2008 RTM – 10.0.1600.22 (64 bit)</td>
<td>Windows Server 2008 R2 Standard</td>
<td>1</td>
</tr>
<tr>
<td>Laptop</td>
<td>HP i5 – 3230 M CPU @2.60GHz with 4GB RAM and 512 GB HDD / OS: Windows 8</td>
<td>Windows 8</td>
<td>1</td>
</tr>
<tr>
<td>Laptop</td>
<td>HP i5 – 2410 M CPU @2.30GHz with 2GB RAM and 512 GB HDD / OS: Windows 7 Pro</td>
<td>Windows 7 Pro</td>
<td>1</td>
</tr>
<tr>
<td>National work-stations (1)</td>
<td>Lenovo Pentium 3.40GHz with 2GB RAM and 80 GB HDD / OS: Windows 7</td>
<td>Windows 7</td>
<td>2</td>
</tr>
<tr>
<td>National work-stations (2)</td>
<td>HP Quad G8400 @2.66GHz with 2 GB (some 1 GB) RAM / OS: Windows 7</td>
<td>Windows 7</td>
<td>3</td>
</tr>
<tr>
<td>National work-stations (3)</td>
<td>HP i5-4570 3.26GHz with 4GB RAM and 512 GB HDD / OS: Windows 7</td>
<td>Windows 7</td>
<td>4</td>
</tr>
<tr>
<td>National work-stations (4)</td>
<td>Dell Core Quad Q8400 2.66 GHz with 2GB RAM and 60GB HDD / OS: Windows 7</td>
<td>Windows 7</td>
<td>6</td>
</tr>
<tr>
<td>Municipality work-stations</td>
<td>A total of 13 work-stations, of which nine use MS Office 10 and four work-stations run on MS Office 2007</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Printers</td>
<td>One functioning printer (the rest are broken). No photocopier machine</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
Annex G

Excel spreadsheets available from the EMIS

The following information can be downloaded as MS Excel outputs for each year between 2011 and 2018:

Table 14. EMIS data tabulations

<table>
<thead>
<tr>
<th>Reference</th>
<th>Data published annually by the EMIS Department until 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Number of students (district-wise by education level, by school type, and by gender)</td>
</tr>
<tr>
<td>1</td>
<td>Number of students (district-wise by grade, by school type, and by gender)</td>
</tr>
<tr>
<td>2</td>
<td>Number of students (district-wise by grade, by age, and by gender)</td>
</tr>
<tr>
<td>3</td>
<td>GER (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>4</td>
<td>NER (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>5</td>
<td>OOSC rate (district-wise by school level and by gender)</td>
</tr>
<tr>
<td>6</td>
<td>Net intake rate (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>7</td>
<td>Apparent intake rate (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>8</td>
<td>Average class size (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>9</td>
<td>Pupil–teacher ratio (district-wise by primary, Basic Education, pre-secondary, and secondary)</td>
</tr>
<tr>
<td>10</td>
<td>Promotion rate (district-wise by grade, by school type, and by gender)</td>
</tr>
<tr>
<td>11</td>
<td>Transition rate (district-wise by school type and by gender)</td>
</tr>
<tr>
<td>12</td>
<td>Percentage of repeaters by grade (district-wise by grade, by school type, and by gender)</td>
</tr>
<tr>
<td>13</td>
<td>Percentage of repeaters by school level (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>14</td>
<td>Repetition rate by grade (district-wise by grade, by school type, and by gender)</td>
</tr>
<tr>
<td>15</td>
<td>Repetition rate by school level (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>16</td>
<td>Dropout rate by grade (district-wise by grade, by school type, and by gender)</td>
</tr>
<tr>
<td>17</td>
<td>Dropout rate by school level (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>18</td>
<td>Actual number of schools (basic education or secondary education)</td>
</tr>
<tr>
<td>19</td>
<td>Number of schools (multi-count) by school level (primary, pre-secondary, secondary)</td>
</tr>
<tr>
<td>20</td>
<td>Number of teachers (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>21</td>
<td>Number of teachers by qualification (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>22</td>
<td>Number of teachers by teaching years (district-wise by school level, by school type, and by gender)</td>
</tr>
<tr>
<td>23</td>
<td>Number of teachers by age (district-wise by school level, by school type, and by gender)</td>
</tr>
</tbody>
</table>
Annex H  Data collection and reporting

Figure 14. Data collection process (as specified in 2015)

Figure 15. EMIS data reporting (as specified in 2015)

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Report Name</th>
<th>Year</th>
<th>English</th>
<th>Tetum</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2010</td>
<td>Published</td>
<td>Paper Printed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011</td>
<td>Published</td>
<td>Published</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2012</td>
<td>Published</td>
<td>Under Process</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2013</td>
<td>Under Process</td>
<td>Not Yet Started</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Web-uploaded</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2014</td>
<td>Under Process</td>
<td>Web-uploaded</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td>Not Yet Started</td>
<td>Web-uploaded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leaftet</td>
<td>2013</td>
<td>Design Completed, Print stopped</td>
<td>Paper Printed</td>
<td></td>
</tr>
<tr>
<td>Data Provision to External Institutions</td>
<td>SEAMEO Annual Education Data</td>
<td>2010-2014</td>
<td>Under Process</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UNESCO UIS Annual School Data</td>
<td>2010-2013</td>
<td>Completed</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2014</td>
<td>Under Process</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any other daily provision to International Partners etc.</td>
<td>2010-2014</td>
<td>On-Going</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Any other daily provision to the other ministries</td>
<td>2010-2014</td>
<td>On-Going</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td>Data Provision to Internal Ministry</td>
<td>Educational Data for MoE Budgeting</td>
<td>2010-2015</td>
<td>-</td>
<td>On-Going</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educational Data for Carta Educativa</td>
<td>2014</td>
<td>-</td>
<td>Completed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educational Data for School Facility</td>
<td>2010-2014</td>
<td>On-Going</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educational Data for multi-language mapping</td>
<td>2014</td>
<td>Completed</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educational Data for pre-school accreditation system</td>
<td>2014</td>
<td>Completed</td>
<td>Electric data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Daily various requests from all other departments in MoE</td>
<td>2010-2014</td>
<td>On-Going</td>
<td>Electric data</td>
<td></td>
</tr>
</tbody>
</table>
Example of anomalies in data: OOSC disaggregated by municipality and gender

The following table presents data that were used to calculate the national OOSC indicator, now disaggregated by municipality and gender:

Table 15. OOSC aged nine disaggregated by municipality and gender, 2018 (Source: EMIS 2018)

<table>
<thead>
<tr>
<th>District</th>
<th>Male (%)</th>
<th>Female (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aileu</td>
<td>15.21%</td>
<td>10.41%</td>
<td>12.88%</td>
</tr>
<tr>
<td>Ainaro</td>
<td>6.95%</td>
<td>2.44%</td>
<td>4.87%</td>
</tr>
<tr>
<td>Baucau</td>
<td>11.04%</td>
<td>0.00%</td>
<td>4.12%</td>
</tr>
<tr>
<td>Bobonaro</td>
<td>3.68%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Cova Lima</td>
<td>5.70%</td>
<td>0.00%</td>
<td>1.49%</td>
</tr>
<tr>
<td>Dili</td>
<td>13.33%</td>
<td>6.53%</td>
<td>10.14%</td>
</tr>
<tr>
<td>Ermera</td>
<td>3.85%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Lautem</td>
<td>9.76%</td>
<td>0.00%</td>
<td>3.58%</td>
</tr>
<tr>
<td>Liquica</td>
<td>9.42%</td>
<td>11.92%</td>
<td>10.61%</td>
</tr>
<tr>
<td>Manatuto</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Manufahi</td>
<td>16.05%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Oecusse</td>
<td>10.63%</td>
<td>0.00%</td>
<td>4.08%</td>
</tr>
<tr>
<td>Viqueque</td>
<td>7.35%</td>
<td>0.00%</td>
<td>1.85%</td>
</tr>
<tr>
<td>National</td>
<td>8.97%</td>
<td>0.00%</td>
<td>3.93%</td>
</tr>
</tbody>
</table>
## Annex J

### Full description of recommendations

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Recommendation</th>
<th>Reference in report</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should develop and implement a policy dedicated to the strengthening of the EMIS, data quality, and the use of data by the Ministry, in response to the Government’s programme to develop the procedures and systems for M&amp;E.</td>
<td>1.01.1</td>
</tr>
<tr>
<td>2</td>
<td>Enabling environment</td>
<td>Undertake a full requirements analysis of EMIS development which can be used to inform an EMIS strategic plan.</td>
<td>1.01.2</td>
</tr>
<tr>
<td>3</td>
<td>Enabling environment</td>
<td>Develop an EMIS strategic plan that can align with the Government’s five-year Strategic Plan (2020–2024). The strategic plan should include a costed, phased approach to the development of the EMIS in all sub-sectors to address the current shortcomings.</td>
<td>1.01.3</td>
</tr>
<tr>
<td>4</td>
<td>Enabling environment</td>
<td>Use the findings and recommendations from this review as an action plan to inform the ESP 2020–2024.</td>
<td>1.01.4</td>
</tr>
<tr>
<td>5</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should establish a senior M&amp;E unit in the Ministry, tasked with analysing data and facilitating data-driven monitoring and reporting by the Ministry, and with developing in-service training packages for managers at national, municipality, and school level. This unit should ensure departments use data for monitoring equitable access, implementation of action plans, informing policy development, and planning procurement. This unit could be an individual data specialist, based in the Minister’s Cabinet and capable of providing capacity development support to senior Ministry staff. The unit should partly substitute for and expand the current data output activities conducted by the EMIS Department.</td>
<td>1.02.1</td>
</tr>
<tr>
<td>6</td>
<td>Enabling environment</td>
<td>The ESP 2020–2024 should be used to support development of the EMIS, enhancing the relevance of data for improved monitoring of the implementation of the strategic framework and developing the requirements to use EMIS data for monitoring plans, education policies, and SDG indicators.</td>
<td>1.02.2</td>
</tr>
<tr>
<td>7</td>
<td>Data analysis and use</td>
<td>The M&amp;E unit/data specialist should facilitate continuous professional development of General and National Directors and Municipality Education Offices regarding the interpretation of EMIS data and utilisation of data for decision-making.</td>
<td>1.02.3</td>
</tr>
<tr>
<td>8</td>
<td>Data analysis and use</td>
<td>A local management training government institution should be tasked with developing management training modules for using the EMIS for education planning, administration, and other functions. This may be done in conjunction with a recognised training institution such as UNESCO’s International Institute for Education Planning. Management should be required to participate in regular in-service training to improve information use.</td>
<td>1.02.4</td>
</tr>
<tr>
<td>9</td>
<td>Enabling environment</td>
<td>Issue a Ministerial Decree mandating the use of EMIS data and explaining the conditions under which EMIS use is mandated.</td>
<td>1.02.5</td>
</tr>
<tr>
<td>10</td>
<td>Enabling environment</td>
<td>The National Directorate of Planning and Inclusive Education should be supported to develop a plan to progressively use data to monitor the SDG indicators.</td>
<td>1.03.1</td>
</tr>
<tr>
<td>#</td>
<td>Category</td>
<td>Recommendation</td>
<td>Reference in report</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>11</td>
<td>System, integrity, decentralisation</td>
<td>Complete the mapping of EMIS data to global and thematic SDG indicators and collect additional data, enabling monitoring against national indicators that are considered relevant to the Ministry of Education, Youth and Sport.</td>
<td>1.03.2</td>
</tr>
<tr>
<td>12</td>
<td>System, integrity, decentralisation</td>
<td>The results of an audit of the quality of data (see recommendation under Section 3.6) should be used to inform a review of all items contained in EMIS forms, and to maintain items that generate data of sufficient quality to be used for equity analysis.</td>
<td>1.04.1</td>
</tr>
<tr>
<td>13</td>
<td>System, integrity, decentralisation</td>
<td>Data collectors (including teachers) should be properly trained on the collection of individual student data, in particular the use of the Washington Group methodology if the data on disability are to be reliable. A review should be undertaken of the complexity and appropriateness of the methodology and consideration should be given to including the detailed responses in the EMIS for administrative review.</td>
<td>1.04.2</td>
</tr>
<tr>
<td>14</td>
<td>System, integrity, decentralisation</td>
<td>A survey should be undertaken of disabled and vulnerable children to assess the accuracy of EMIS data and to make recommendations to improve the accuracy of the recording of data.</td>
<td>1.04.3</td>
</tr>
<tr>
<td>15</td>
<td>System, integrity, decentralisation</td>
<td>Review the methodology for the assessment of disability status, including formulation of questions and professional development of school staff conducting the assessment.</td>
<td>1.04.4</td>
</tr>
<tr>
<td>16</td>
<td>System, integrity, decentralisation</td>
<td>Review the methodology for collecting information about the socioeconomic status of children to ensure more accurate data are reported through the EMIS.</td>
<td>1.04.5</td>
</tr>
<tr>
<td>17</td>
<td>Data analysis and use</td>
<td>Publish data disaggregated by sukos, aldeias, and schools for required disaggregated data and calculated indicators.</td>
<td>1.04.6</td>
</tr>
<tr>
<td>18</td>
<td>Enabling environment</td>
<td>The EMIS Department should review the data for children who are not accommodated in OOSC figures and determine methods for ensuring these children are identified and included.</td>
<td>1.05.1</td>
</tr>
<tr>
<td>19</td>
<td>System, integrity, decentralisation</td>
<td>Children at risk of dropping out should be identified by the EMIS based on attendance and other factors. These children should be targeted for special assistance. Alternatively, the Ministry of Education, Youth and Sport should consider setting up a system that allows the identification of children at risk of dropping out through monitoring of attendance and other indicators at the school level.</td>
<td>1.05.2</td>
</tr>
<tr>
<td>20</td>
<td>Data analysis and use</td>
<td>Other departments require training in the use of OOSC data for planning education. In particular, non-formal education programmes need to be aware of OOSC and the magnitude and location of those children being left behind. The provision of programmes such as primary and middle school equivalency should be assessed based on the types of OOSC. This requires the accurate use of OOSC data.</td>
<td>1.05.3</td>
</tr>
<tr>
<td>21</td>
<td>System, integrity, decentralisation</td>
<td>Develop tools and methodologies to identify children that are not at school, disaggregated by suko level, as a step towards schools using OOSC data as a tool to resolve barriers around OOSC.</td>
<td>1.05.4</td>
</tr>
<tr>
<td>22</td>
<td>Data analysis and use</td>
<td>Share relevant OOSC data and indicators with schools, as a quality assurance measure and as a first step towards using data to make improvements at the school level so schools and communities are aware of OOSC issues.</td>
<td>1.05.5</td>
</tr>
<tr>
<td>#</td>
<td>Category</td>
<td>Recommendation</td>
<td>Reference in report</td>
</tr>
<tr>
<td>----</td>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>23</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should conduct an audit of the quality of the EMIS data, including the formulas used to calculate indicators, to assess the data accuracy.</td>
<td>1.06.1</td>
</tr>
<tr>
<td>24</td>
<td>Enabling environment</td>
<td>That results of the audit should inform a wider review of the EMIS, helping the Ministry of Education, Youth and Sport to develop a policy framework for quality aspects, and to prioritise the collection of data that do meet standards. Data quality guidelines should be developed for the EMIS to help ensure data quality. The guidelines may also result in changes to regulations concerning the management and verification of data.</td>
<td>1.06.2</td>
</tr>
<tr>
<td>25</td>
<td>System, integrity, decentralisation</td>
<td>School inspectors should conduct spot-checks in schools to monitor whether schools provide accurate data and to help verify the accuracy of data. Issues relating to EMIS data should be recorded upon completion of the inspection of a school. This can help identify schools that are providing poor data.</td>
<td>1.06.3</td>
</tr>
<tr>
<td>26</td>
<td>System, integrity, decentralisation</td>
<td>Feedback loops should be reviewed for commenting on bad data. This should encourage the use of data by helping to strengthen the perception that poor data can be assessed and corrected by those tasked with using the data.</td>
<td>1.06.4</td>
</tr>
<tr>
<td>27</td>
<td>System, integrity, decentralisation</td>
<td>Direct access to the EMIS should be granted to schools and municipalities to help manage and verify individual student data. This will help improve the accuracy and timeliness of data.</td>
<td>1.06.5</td>
</tr>
<tr>
<td>28</td>
<td>System, integrity, decentralisation</td>
<td>Build in additional validation checks, to prevent inaccurate data entries.</td>
<td>1.06.6</td>
</tr>
<tr>
<td>29</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should review and further develop the regulating framework of the EMIS Department and document all organisational processes at each step of the data collection and verification cycle.</td>
<td>1.07.1</td>
</tr>
<tr>
<td>30</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should issue a policy (as part of the EMIS policy) mandating the timely submission of education data required from the EMIS from all public and private institutions.</td>
<td>1.07.2</td>
</tr>
<tr>
<td>31</td>
<td>Enabling environment</td>
<td>Legislation concerning the submission of false, misleading, or late data should be enacted for the Ministry of Education, Youth and Sport. Penalties should be imposed for the submission of late or misleading data.</td>
<td>1.07.3</td>
</tr>
<tr>
<td>32</td>
<td>System, integrity, decentralisation</td>
<td>Develop guiding manuals that practically explain the role and responsibility of each person in the data submission and data verification process.</td>
<td>1.07.5</td>
</tr>
<tr>
<td>33</td>
<td>Enabling environment</td>
<td>Develop and enact legislation regarding the rights of individuals to data privacy concerning EMIS data.</td>
<td>1.08.1</td>
</tr>
<tr>
<td>34</td>
<td>Enabling environment</td>
<td>Develop guidelines concerning access to and use of individual data, including criteria to ensure the anonymity of individuals.</td>
<td>1.08.2</td>
</tr>
<tr>
<td>35</td>
<td>System, integrity, decentralisation</td>
<td>Integrate PMIS databases on teachers as part of the EMIS so that data are fully and automatically aligned.</td>
<td>1.09.1</td>
</tr>
<tr>
<td>36</td>
<td>System, integrity, decentralisation</td>
<td>The EMIS should align its student data with a civil registry. This would provide a database of all children in the country who are registered and would enable more accurate tracking of individual children and identification of OOSC.</td>
<td>1.09.2</td>
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<td>37</td>
<td>Enabling environment</td>
<td>Government coding standards should be developed. Dialogue should commence between sectors regarding the use of a unique national code for individuals in the different sectorial databases. Ideally, a civil registry should form the basis for the unique code. Databases should be aligned on the coding system. Coding systems for other entities common to multiple government systems, such as institutions, assets, and regions, should be developed. This would ultimately enable the sharing of data between systems and the identification of children who are not gaining access to essential services, such as vaccination, education, and child welfare services. While such alignment may take many years, the process should be started.</td>
<td>1.09.3</td>
</tr>
<tr>
<td>38</td>
<td>System, integrity, decentralisation</td>
<td>Use the recommendations from the 2015 Management Strengthening Report (World Bank) to integrate PMIS and EMIS data and conduct, an audit of the accuracy of data in both databases.</td>
<td>1.09.4</td>
</tr>
<tr>
<td>39</td>
<td>System, integrity, decentralisation</td>
<td>DNPPMA should continue the mapping of education data to the SDG indicators and targets.</td>
<td>1.10.1</td>
</tr>
<tr>
<td>40</td>
<td>Enabling environment</td>
<td>Legislation or policy should be developed and passed giving authority to the EMIS Department concerning relevant statistical matters and standards for the Ministry of Education, Youth and Sport.</td>
<td>1.10.2</td>
</tr>
<tr>
<td>41</td>
<td>Data analysis and use</td>
<td>Assess the annual training requirements of staff at school and municipal levels to ensure professional development needs can be regularly addressed.</td>
<td>1.11.2</td>
</tr>
<tr>
<td>42</td>
<td>Enabling environment</td>
<td>Use the full requirements analysis (Recommendation 1.01.2) to specify the annual operational budget of the EMIS.</td>
<td>1.11.3</td>
</tr>
<tr>
<td>43</td>
<td>Enabling environment</td>
<td>Undertake a cost-effectiveness study in regard to the possibility of utilising local service providers for hosting the EMIS and development of the EMIS.</td>
<td>1.11.4</td>
</tr>
<tr>
<td>44</td>
<td>Enabling environment</td>
<td>As noted in Recommendation 1.1.1, a strategic plan for the EMIS should be developed to align with the (proposed) revised national ESP (2020–2024). The plan should specify the annual development and operational budget required, and specify how this will change over time as innovations are undertaken, such as decentralisation of data entry. This should help engage partners and foster the required funding for the EMIS. The plan should also include the budget required by each department for training and to adjust to changes in the EMIS.</td>
<td>1.12.1</td>
</tr>
<tr>
<td>45</td>
<td>Enabling environment</td>
<td>Closely linked to Recommendation 1.12.1, the EMIS Department should specify annually the operational and development budget required, as separate from DNPPMA.</td>
<td>1.12.2</td>
</tr>
<tr>
<td>46</td>
<td>Enabling environment</td>
<td>The operational budget for the EMIS should include an allocation for upgrading or replacement of hardware used for the EMIS, internet connectivity (if applicable), and recurrent training for staff at all levels in regard to access to and use of the system.</td>
<td>1.12.3</td>
</tr>
<tr>
<td>47</td>
<td>Data analysis and use</td>
<td>The EMIS Department should publish a description of indicators and disaggregation of data in one of Timor-Leste’s two official languages, as a first, minor, step to facilitate access to and use of EMIS data.</td>
<td>1.13.1</td>
</tr>
<tr>
<td>48</td>
<td>Data analysis and use</td>
<td>The Ministry of Education, Youth and Sport should annually share relevant EMIS data and indicators with municipality offices and schools in order to facilitate access to data. Data should be shared in a format that has meaning to school heads, administrators, teachers, and communities.</td>
<td>1.13.2</td>
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<tr>
<td>49</td>
<td>Data analysis and use</td>
<td>Review the planning and monitoring requirements for municipalities and develop reports from the EMIS which reflect planning needs. Monitor the use of EMIS data in planning and monitoring.</td>
<td>1.13.3</td>
</tr>
<tr>
<td>50</td>
<td>System, integrity, decentralisation</td>
<td>Develop a school portal to the system which will enable schools that are able to to access school data and replace manual student record-keeping with electronic student record-keeping.</td>
<td>1.13.4</td>
</tr>
<tr>
<td>51</td>
<td>System, integrity, decentralisation</td>
<td>Develop and pilot a student report card from the EMIS to enable schools which can access the EMIS directly to generate student report cards.</td>
<td>1.13.6</td>
</tr>
<tr>
<td>52</td>
<td>System, integrity, decentralisation</td>
<td>Develop a school report card that is linked to school development planning. The school report card should be published on the website of the Ministry of Education, Youth and Sport annually, and should be searchable for each school. The report card can indicate progress towards national goals, such as reducing dropout and the provision of adequate facilities. There are many examples of such report cards but it is important that the report cards are applicable to school planning in Timor-Leste.</td>
<td>1.13.7</td>
</tr>
<tr>
<td>53</td>
<td>Data analysis and use</td>
<td>EMIS data required for schools, the public, and municipalities should be printed in hardcopy format or available on media in Excel spreadsheets and analytical documents annually, for distribution to communities and consumption by municipalities. This should be done until such time as municipalities and communities are able to reliably and cost-affordably access the internet.</td>
<td>2.01.1</td>
</tr>
<tr>
<td>54</td>
<td>Data analysis and use</td>
<td>EMIS data access and use should be surveyed annually at municipal, school, and public levels, and changes to the distribution of hardcopy data should be adjusted based on the survey results.</td>
<td>2.01.2</td>
</tr>
<tr>
<td>55</td>
<td>Data analysis and use</td>
<td>A communication strategy should be developed to engage the media and other outlets in the receipt and publishing of EMIS data. The media can play a strong role in ensuring the public has access to information on their local schools.</td>
<td>2.01.3</td>
</tr>
<tr>
<td>56</td>
<td>Enabling environment</td>
<td>As part of the full requirements analysis, assess internet connectivity solutions at sub-national level, as well as at school level, at least at the central schools for basic education, and in the long term for all schools.</td>
<td>2.01.4</td>
</tr>
<tr>
<td>57</td>
<td>Enabling environment</td>
<td>Develop a partnership with one of the private telecommunication companies and negotiate an affordable internet access solution.</td>
<td>2.01.5</td>
</tr>
<tr>
<td>58</td>
<td>System, integrity, decentralisation</td>
<td>Develop an interface so that directorates, municipality offices, and schools can access disaggregated data, to enhance data relevance for micro-level planning.</td>
<td>2.01.6</td>
</tr>
<tr>
<td>59</td>
<td>System, integrity, decentralisation</td>
<td>Translate the EMIS website into Portuguese and widely share the URL to encourage use.</td>
<td>2.01.7</td>
</tr>
<tr>
<td>60</td>
<td>Data analysis and use</td>
<td>Develop in-service training modules for municipal and national-level planners and administrators to help train them to be more effective in utilising EMIS data for decision-making.</td>
<td>2.01.8</td>
</tr>
<tr>
<td>61</td>
<td>Data analysis and use</td>
<td>The EMIS Department should hold a quarterly or annual presentation of data and indicators for Ministry departments, including a capacity development component on how to interpret and use indicators for decision-making – in particular, preparing annual workplans and budgets.</td>
<td>2.02.1</td>
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<tr>
<td>62</td>
<td>System, integrity, decentralisation</td>
<td>Develop an interface that lets departments, municipality offices, and schools directly access disaggregated data by school (refer to Recommendation 2.01.6), including school, WASH, state of classrooms, access to water, etc.</td>
<td>2.02.2</td>
</tr>
<tr>
<td>63</td>
<td>System, integrity, decentralisation</td>
<td>Create a feedback loop with the interface, enabling departments to contribute to data verification, resulting in enhanced accuracy, timeliness, and credibility of the EMIS data.</td>
<td>2.02.3</td>
</tr>
<tr>
<td>64</td>
<td>Data analysis and use</td>
<td>The interface (refer to Recommendation 2.01.6) should present data and indicators in a format that facilitates understanding, including charts and explanatory diagrams.</td>
<td>2.02.3</td>
</tr>
<tr>
<td>65</td>
<td>Data analysis and use</td>
<td>Municipality offices and schools should receive an annual report with official and relevant data, presented in a way that intended users of the information can understand, as a first step towards improving the implementation of plans.</td>
<td>2.03.1</td>
</tr>
<tr>
<td>66</td>
<td>Data analysis and use</td>
<td>The reports that municipality offices receive should allow schools and municipality offices to compare some performance indicators between municipalities. These could be teacher / student ratios, average class sizes, key indicators related to school infrastructure, OOSC, etc.</td>
<td>2.03.2</td>
</tr>
<tr>
<td>67</td>
<td>Data analysis and use</td>
<td>Enhance the access to individual school data by developing a school portal and develop the capacity of Basic Education Directors to start using data and indicators as an input for school development planning.</td>
<td>2.03.3</td>
</tr>
<tr>
<td>68</td>
<td>System, integrity, decentralisation</td>
<td>The previously recommended integration of EMIS and PMIS databases would generate uniform, consolidated data on state-paid teachers throughout the Ministry of Education, Youth and Sport. The processes to report on teacher transfers, and possibly additional variables, must be reviewed so that it is clear how different systems can be updated automatically and how departments use consolidated data.</td>
<td>2.04.0</td>
</tr>
<tr>
<td>69</td>
<td>System, integrity, decentralisation</td>
<td>Schools should follow specific procedures to report on student transfers. This will help reduce the duplication of students. Quality assurance, including guiding manuals and legislation, should be developed to ensure schools better comply with the procedures. Student transfers should be entered into the EMIS as they occur.</td>
<td>2.04.1</td>
</tr>
<tr>
<td>70</td>
<td>System, integrity, decentralisation</td>
<td>Investigate whether a review of the EMIS can result in monitoring school attendance and student achievements. Alternatively, school inspectors can monitor student attendance by conducting headcounts, the results of which can be compared with the official EMIS student enrolment numbers.</td>
<td>2.05.1</td>
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<tr>
<td>71</td>
<td>System, integrity, decentralisation</td>
<td>Develop a pilot project to monitor the attendance and academic achievement of pupils and to provide early warning for potential dropouts.</td>
<td>2.05.2</td>
</tr>
<tr>
<td>72</td>
<td>Enabling environment</td>
<td>Develop coordination mechanisms between the Ministry of Education, Youth and Sport, municipality offices, and schools, including communication mechanisms such as emails and WhatsApp, or alternative solutions.</td>
<td>2.05.3</td>
</tr>
<tr>
<td>73</td>
<td>Enabling environment</td>
<td>The Ministry of Education, Youth and Sport should recruit a data and capacity development specialist who can drive the development of the EMIS, and the analysis and utilisation of data.</td>
<td>2.07.1</td>
</tr>
</tbody>
</table>