OpenEMIS Concept Note – ECDE

Tracking and Monitoring Early Childhood Development and Education Data using an Open Education Management Information System (OpenEMIS)

March 2026

Tracking and Monitoring Early Childhood Development and Education (ECDE) Data using an OpenEMIS

Executive Summary

This concept note proposes the deployment of OpenEMIS to enable governments to track, monitor, and improve early childhood development and education (ECDE) outcomes through integrated, child-level data systems aligned with Sustainable Development Goal (SDG) 4.2.

OpenEMIS provides a government-owned, open-source Education Management Information System (EMIS) that supports the collection, management, and use of high-quality data across the education sector, including early childhood. By establishing longitudinal learner records from early childhood onward, OpenEMIS enables evidence-based decision-making, improved service delivery, and better outcomes for children.

The Challenge

Early childhood, defined as the period from birth to eight years old, is a critical phase of rapid development across social, emotional, cognitive, and physical domains. Ensuring that children are developmentally on track is essential for lifelong learning and wellbeing.

Despite global commitments under SDG 4.2—"By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education"—many countries face significant challenges in monitoring ECDE systems.

Key challenges include:

- Fragmented or non-existent data systems for early childhood
- Sometimes informal nature of ECDE centers present challenge to structured data collection
- Limited availability of developmentally on-track data
- Weak integration between education, health, nutrition, and social services
- Inadequate tools for tracking individual child development over time

These gaps constrain governments' ability to:

- Design effective policies
- Target vulnerable populations, ensuring no young learner is left behind
- Allocate resources efficiently
- Monitor progress toward national and global goals

Why Now

Growing global investment in early childhood development, combined with advances in digital public infrastructure, presents a timely opportunity to establish integrated ECDE data systems at scale. Governments increasingly require real-time, reliable data to inform policy and improve service delivery, particularly in support of SDG 4.2.

OpenEMIS Initiative

The OpenEMIS Initiative aims to deploy a high-quality Education Management Information System designed to collect and report data on schools, students, teachers, and staff. The system was conceived by UNESCO as a royalty-free solution that can be customized to meet the specific needs of member countries.

Now in its 15th year, the initiative is coordinated by Community Systems Foundation (CSF). OpenEMIS is well positioned to support national system strengthening while addressing the monitoring requirements of the Sustainable Development Goals.

OpenEMIS is deployed as a web-based application and is mobile responsive, enabling access via smartphones, tablets, laptops, and desktop computers. A suite of tools enhances the platform's capabilities in data collection, management, analysis, and resource planning.

Solution and Value Proposition

OpenEMIS offers a customizable, non-commercial platform that enables countries to strengthen ECDE systems through integrated, child-centered data.
Through OpenEMIS, governments can:

- Establish **unique learner identifiers** from early childhood
- Capture **holistic child data**, including demographic, health, nutrition, and developmental information
- Track **longitudinal learning trajectories** across education levels
- Generate **real-time indicators** aligned with national priorities and SDG 4.2
- Support **evidence-based decision-making** at all levels

OpenEMIS uniquely enables countries to build sustainable, government-owned systems without vendor lock-in, while supporting interoperability with other national systems.

Approach

The implementation of OpenEMIS for ECDE follows a results-oriented approach:
Inputs

- OpenEMIS platform and tools
- National customization and configuration
- Capacity building and training

System Functionality

- Individual learner records with unique IDs
- Data capture on enrollment, attendance, development, and context
- Dashboards, reports, and data portals

Outputs

- Real-time ECDE data and indicators
- Integrated datasets across institutions and learners

Outcomes

- Improved identification of children needing support
- Better planning and resource allocation
- Enhanced coordination across sectors

Impact

- Increased proportion of children entering primary school developmentally on track

System Functionality

OpenEMIS Core provides a robust solution to collect, manage, and use ECDE data.

At the individual level, each child enrolled in an ECDE program is assigned a unique ID, enabling the creation of comprehensive learner records. These records may include:

- Demographic background
- Health and nutrition data
- Participation and attendance patterns
- Behavioral observations
- Early learning and developmental milestones (e.g., fine motor skills)

These records support:

- Teachers in adapting learning activities and identifying children needing additional support
- Schools in planning resources, staffing, and inclusive strategies
- Ministries in analyzing trends and planning interventions

Importantly, learner records follow children as they transition from early childhood into primary and secondary education, creating a continuous education profile. Records can be integrated with other government systems such as health and social services.

OpenEMIS also supports the generation of transactional reports and dashboards, enabling the transformation of raw data into actionable insights through data portals and visualization tools.

Figure 1 - Student list

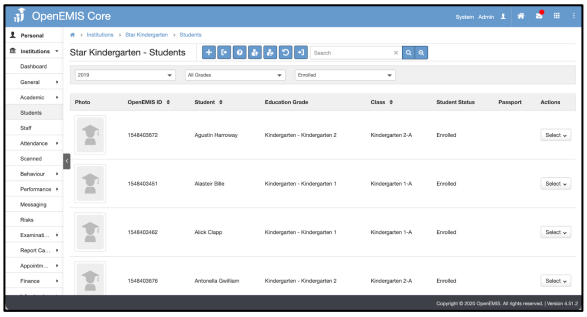


Figure 2 - Student Record

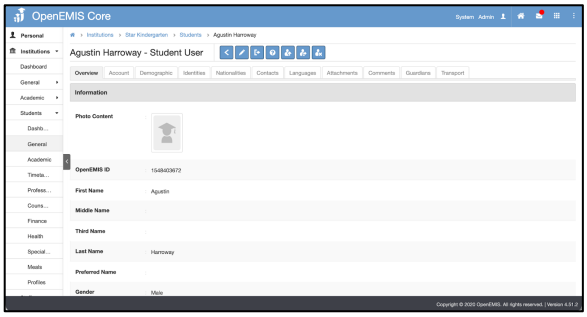


Figure 3 - Student Academic History

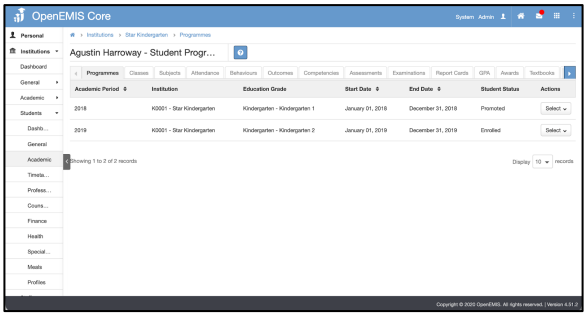


Figure 4 - Student Health Record

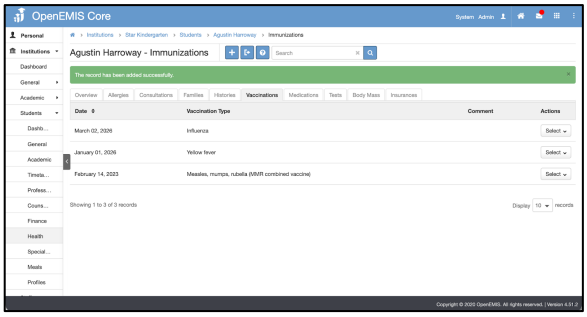


Figure 5 - Student Special Needs

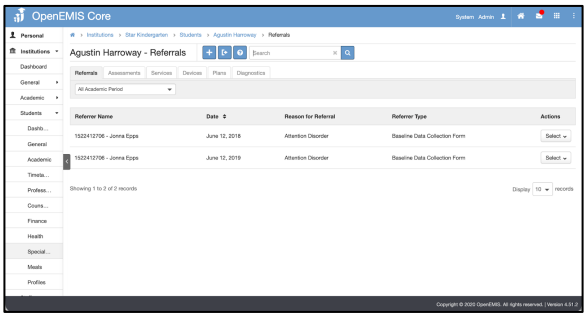


Figure 6 - Sample Report

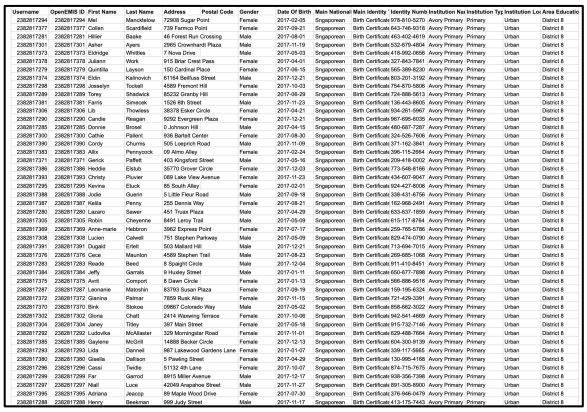
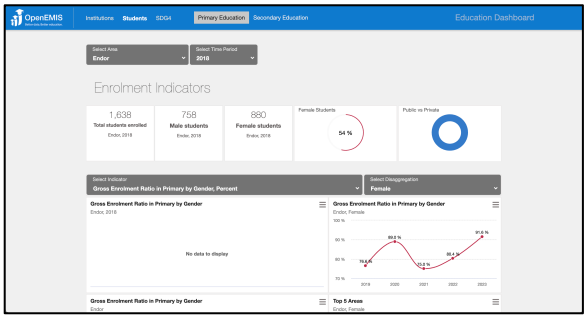


Figure 7 - Sample Data Portal

Figure 8 - Sample Dashboard



Use Cases

Teacher Level

- Identify children with developmental delays
- Adapt teaching approaches to individual needs

School Level

- Plan staffing and classroom resources
- Monitor attendance and participation patterns

District Level

- Target underserved or vulnerable populations
- Allocate resources based on real-time data

National Level

- Inform ECDE policy and planning
- Monitor progress toward SDG 4.2
- Coordinate interventions across sectors

Measurement Framework

OpenEMIS supports the collection and production of internationally aligned ECDE indicators, including:

Access and Participation

- Number of students in pre-primary institutions
- Gross enrolment ratio in pre-primary
- Participation rate in organized learning

Equity

- Percentage of students identified as vulnerable (e.g., disability)

System Capacity

- Number of pre-primary institutions
- Number of staff and qualified teaching staff

Transition and Outcomes

- Percentage of children aged 6–7 entering school who attended preschool

These indicators can be produced in near real time and disseminated through dashboards, reports, and interactive data portals to support decision-making at all levels.

Implementation and Support

To ensure sustainable implementation, OpenEMIS provides a comprehensive package of services, including:

- Policy and Planning Services
- Analytical Services
- Implementation Services
- Support Services
- Software Development Services
- Ad Hoc Services

In addition, the OpenEMIS Lab offers structured training programs (to build national capacity.

A dedicated Service Desk, supported by education experts and technicians, provides ongoing user support, complemented by an online knowledge base available through OpenEMIS Support.

Community Systems Foundation (CSF) provides technical support across all phases of implementation, emphasizing country ownership, capacity development, and long-term sustainability.

References

United Nations Educational, Scientific and Cultural Organization (UNESCO). Early Childhood Care and Education. https://en.unesco.org/themes/early-childhood-care-and-education

United Nations Children's Fund (UNICEF). Early Childhood Development. https://www.unicef.org/earlychildhood/

United Nations Educational, Scientific and Cultural Organization (UNESCO). Education Indicators Technical Guidelines 2009 (English, PDF). https://www.openemis.org/files/resources/Indicator_Technical_guidelines_en.pdf

OpenEMIS features hundreds of transactional data reports, including reports on institutions, students and all elements of data collected through the system. Here are some examples:

- Institutions_Institutions - All Areas Level - All Areas - All Institutions - 20260312T151144.xlsx
- Students_Students - 2026 - -- Select -- - -- Select -- - P1002 - Avory Primary School - March 12, 2026 to March 12, 2026 - 20260312T151914.xlsx

OpenEMIS software can transform raw data into indicators, to automate the production of sub-sector Key Performance Indicators. These indicators can be disseminated through reports, data portals and dashboards. Here are some examples:

- Schools' dashboard (*example, but without ECE schools included)*
- Students' dashboard (*example, but without ECE schools included*)
- WASH in Schools
- Textbooks (*example: could be any essential ECE equipment*)
- Interactive Data Portal