# Summary of Results by Strategic Objective

Strategic objective 1. HIS governance

CHISU continued to strengthen governance and HIS enabling environments in Burkina Faso, Haiti, Indonesia, Madagascar, Malawi, Mali, Niger, Serbia, and the Middle East and North Africa (MENA) region. At the global level, CHISU initiated work to catalyze implementation of the **World Health Organization's (WHO) routine health information systems (RHIS) Strategy** and provided **global HIS management and leadership** through contribution to USAID platforms and regional and global bodies and networks, and through leadership in the Health Data Collaborative (HDC) and Digital Health and Interoperability (DH&I) working groups. See Figure 1 for a summary of CHISU interventions in SO1.

FIGURE 1 - SUMMARY OF CHISU INTERVENTIONS IN SO1

HIS organization structure and functions **5%**

HIS leadership and coordination **42%**

HIS strategic planning **37%**

FY22 SO1 Interventions n = 19

M&E plan **5%**

Existence of HIS policies and legislation **11%**

By conducting the HIS stages of continuous improvement (SOCI) assessment with national stakeholders, CHISU is building capacity to identify gaps and strengths of the national HIS and is applying these insights to national strategic planning. The SOCI results were an important baseline measure of the status of the national HIS for the country and for project implementation. SOCI assessments started in FY21 and were completed with improvement plans and general reports in FY22 in Burkina Faso and Serbia. In FY22, SOCI assessments
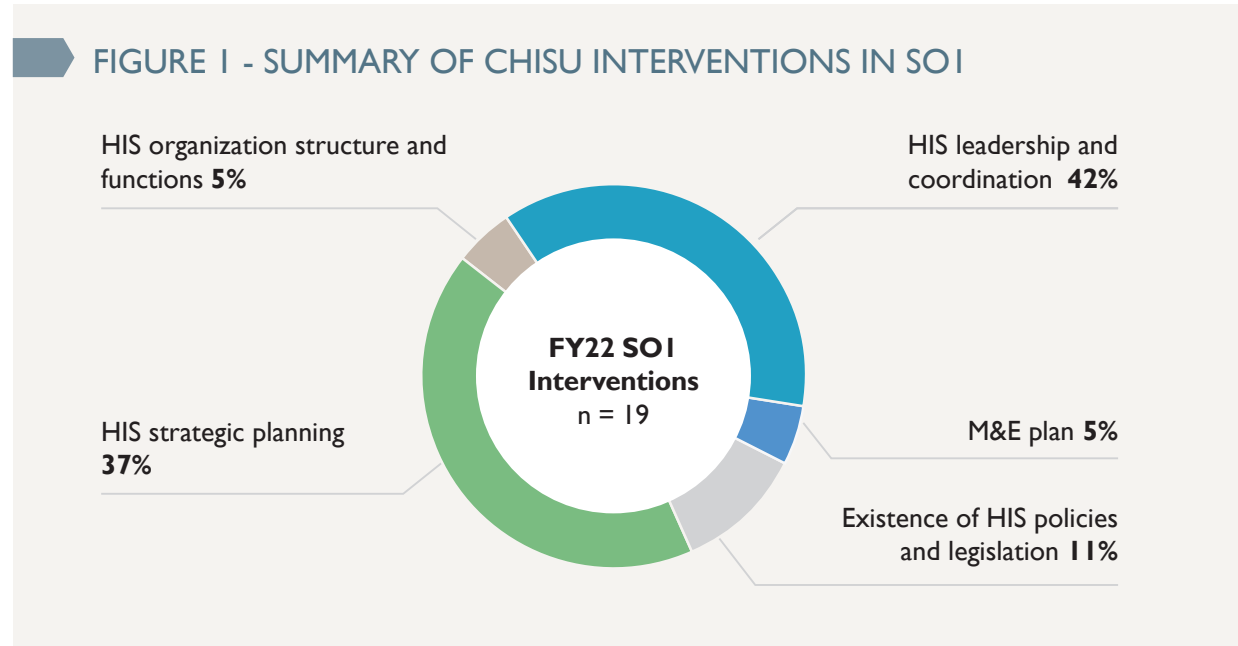
were conducted in Malawi and Niger and the results informed the new strategic planning process (Box 1). The SOCI toolkit was adapted for the Indonesian context, creating a macro- and micro-level digital maturity assessment tool that was tested with more than 80 stakeholder representatives. In collaboration with PMI Measure Malaria, coordination of the Madagascar SOCI assessment began, which will support the development of the country's next HIS Strategy 2023-2027.

CHISU supported HIS coordination bodies in several countries, which serve as key convening mechanisms, facilitate more effective use of resources, and reduce fragmentation in the HIS ecosystem. In **Burkina Faso**, CHISU's contributions to revitalizing the One Health technical secretariat and thematic commissions saw the One Health strategic plan validated. CHISU trained administrators on the One Health database and led the development of the joint investigation forms with

BOX 1. SOCI FINDINGS IN NIGER AND MALAWI

The SOCI toolkit measures the stage of maturity across five HIS domains. This informs the development of national strategic plans and targeted improvement plans to progress to stronger HIS.

Niger completed the SOCI assessment in 2022, with component scores ranging from emerging/ad hoc (1) to defined (3).

- HIS leadership and governance scored as defined (3), with higher measures on HIS strategy and organizational structures and functions. Strengthening of policies, legal and regulatory frameworks, and compliance (repeatable, 2) is a strong priority.
- HIS management and workforce development is weak, with a score of 2 (repeatable) for HIS workforce capacity and development and HIS financing, while the subcomponent HIS resource mobilization seems to be non-existent (0).
- Information communication technology (ICT) infrastructure scored poorly as repeatable (2) with highest concerns focused on internet connectivity and business continuity that are still at the emerging stages (1).
- HIS standards and interoperability overall scored 2 (repeatable), with the most urgent need focused on the lowest scores clustering in enterprise architecture, data exchange standards, and individual/ aggregate/ community data exchange (emerging/ad hoc, 1).
- Data quality scored defined (3) and overall data use remains weak (repeatable, 2), though some subcomponents did reach defined (3), including synthesis and communication, reporting and analytics features, and data collection alignment with workflow. Fostering data quality in all aspects, including developing a plan for data quality assurance, will improve data use by increasing trust that will lead to more data demand and use.

Malawi completed the SOCI assessment in 2022, with component scores ranging from repeatable (2) to managed (4).

- Leadership and governance scored 4 (managed) owing to the availability of relevant policies, strategies, and coordination mechanisms. Enforcement and adherence to policies were noted as challenges.
- HIS management and workforce scored 3 (defined) due to past and ongoing recruitment efforts to fill data management vacancies at the facility level. Human resources policies were weaker (repeatable, 2), with improvements needed in staff management and retention.
- HIS ICT infrastructure scored 2 (repeatable) as blueprints and processes are documented and some systems are functional. ICT inventory tracking, connectivity, and user capacity need to be strengthened to support data management.
- HIS standards and interoperability scored 3 (defined) owing to the availability of key interoperability components (i.e., the interoperability layer and master facility list). However, a clear roadmap is missing with enterprise architecture (repeatable, 2) and person data exchange (emerging/ad hoc, 1).
- HIS data quality and use scored 3 (defined) because tools are in place and SOPs implemented. However, these processes are not fully institutionalized and there is a need for comprehensive data quality assurance and data use plans.

BOX 2. IMPROVEMENTS IN HIS GOVERNANCE

- In Burkina Faso, CHISU supported development and finalization of the One Health thematic surveillance commission regulatory texts with clear definition of the responsibilities and composition aligned with international health regulations.[1]
- Also in Burkina Faso, the SOCI-informed HIS strategic plan 2021-2025 was developed and validated with CHISU's support.
- In Serbia, the SOCI-informed eHealth Strategy was finalized and adopted in February 2022 with publication on the MOH and Office for Information Technology and eGovernment websites. The accompanying action plan was adopted in May 2022, creating a road map for the next two years and defining activities to further digitize the health system.

CHISU supported the development of the Digital Health Policy in Malawi by participating in drafting workshops and virtual discussions with partners (Photo: CHISU Malawi)

1 World Health Organization. International Health Regulations, 3rd edition. Available at: https://www.who.int/publications/i/item/9789241580496

several ministries. In **Indonesia**, CHISU developed orientation materials and sensitized stakeholders within the Ministry of Health's (MOH) Center for Data and Information Technology (Pusdatin) on best practices for establishing an HIS technical working group (TWG), preliminarily defining problems to be solved, scope, and potential members of the TWG. In **Mali**, CHISU has been developing terms of reference (TOR) for TWGs focused on data quality and health emergency management. In **Malawi**, CHISU has been coordinating the monitoring and evaluation (M&E) TWGs of both the National Malaria Control Program and the MOH. In **Serbia**, CHISU supported the development of the SOCI-informed eHealth Strategy, adopted in February 2022, and a two-year eHealth Action Plan that defines activities in the process of further digitization of the health system, with responsibilities, timelines, and budgets. CHISU participated in regular coordination meetings for COVID-19 vaccination campaigns and supported COVID-19 data-sharing mechanisms in **Mali**.

To support data standardization through guidelines, policies, and regulations, CHISU in **Haiti** is supporting the Ministry of Public Health Protection (MSPP) in moving the Digital Health Policy Agenda forward. CHISU and USAID/Haiti met with the MSPP Unit of Evaluation and Programming (UEP) to gather feedback on the data security and patient confidentiality elements of the initial draft of the eHealth Policy. CHISU also supported development of the Digital Health Policy in **Malawi** by participating in three drafting workshops and two virtual discussions with WHO and other partners. CHISU **Indonesia** made significant progress on mapping and

BOX 3. IMPROVEMENTS IN SYSTEMS AND SOFTWARE

System enhancements. CHISU improved MS-Surveillance COVID-19 vaccination and testing capacity in Burkina Faso by introducing appointment scheduling software. CHISU developed a prototype of the electronic *passe sanitaire* in Haiti for COVID-19 vaccine recipients. CHISU also enhanced the national data web portal in Haiti called *Carte Sanitaire* to include COVID-19 Tracker data. CHISU supported the national launch of the Satu Sehat data integration platform by demonstrating interoperability of software applications covering more than 3,500 health facilities in East Java. CHISU finalized a Malagasy version of the HPHC questionnaire in Madagascar to accommodate a wider variety of respondents, especially from rural areas. CHISU strengthened the COVID-19 surveillance system in Mali by configuring a link to the vaccination system, enabling client follow up throughout notification, treatment, and vaccination.

Scale-up of systems. CHISU expanded use of Burkina Faso's ENDOS to health facility-level by training nearly 400 staff across 254 health facilities in seven health districts to collect and enter data directly into ENDOS, where previously district-level staff entered facility reports. CHISU also expanded use of Burkina Faso's One Health Event-Based Surveillance (EBS) to community level by training 1,530 community agents in four provinces to report on the occurrence of notifiable diseases and other events of public health importance.

Interoperability. CHISU improved interoperability in Burkina Faso by linking three new data systems to the ENDOS system. Community data collected using CommCare are sent to the UNICEF RapidPro tool via SMS and then integrated into ENDOS using the CHISU-supported interoperability layer. Data from mHealth, a mobile app for community health data, and NetSIG2, for public health supply chain and logistics management, were also linked to ENDOS.

Strategic objective 2. Systems and software

CHISU works with stakeholders in Burkina Faso, Haiti, Indonesia, Madagascar, Mali, and Niger to develop or enhance HIS to function at scale and respond to user needs, making high-quality data available to decision-makers. At the global level, CHISU also enhanced the electronic **high performing health care (HPHC) tool** with a Spanish language option, filter functionality, and subnational visualization. CHISU is developing a web-based **HIS SOCI tool** with dashboard visualization and consensus and gender scores. CHISU continued to develop an **artificial intelligence (AI)/machine learning (ML) knowledge hub** that includes an ML-powered newsfeed. See Figure 2 for a summary of CHISU interventions in SO2.

CHISU provides technical and financial support for system enhancements, optimization, and maintenance. In **Burkina Faso**, this included training administrators of the One Health system and developing joint investigation forms with contributions from several ministries. CHISU worked with the Directorate of HIS to clean the metadata in ENDOS (the national routine information system). CHISU reviewed and simplified COVID-19 forms in MS-Surveillance (MOH's One Health surveillance database). CHISU supported the installation of an application, BF-SANTE, which allows Burkinabe to make an appointment for COVID-19 PCR tests and download results and vaccination cards, which has resulted in a reduction of the turnaround time for results from 72 to 24 hours. In **Haiti**, CHISU provided troubleshooting for the COVID-19 Vaccination tracker
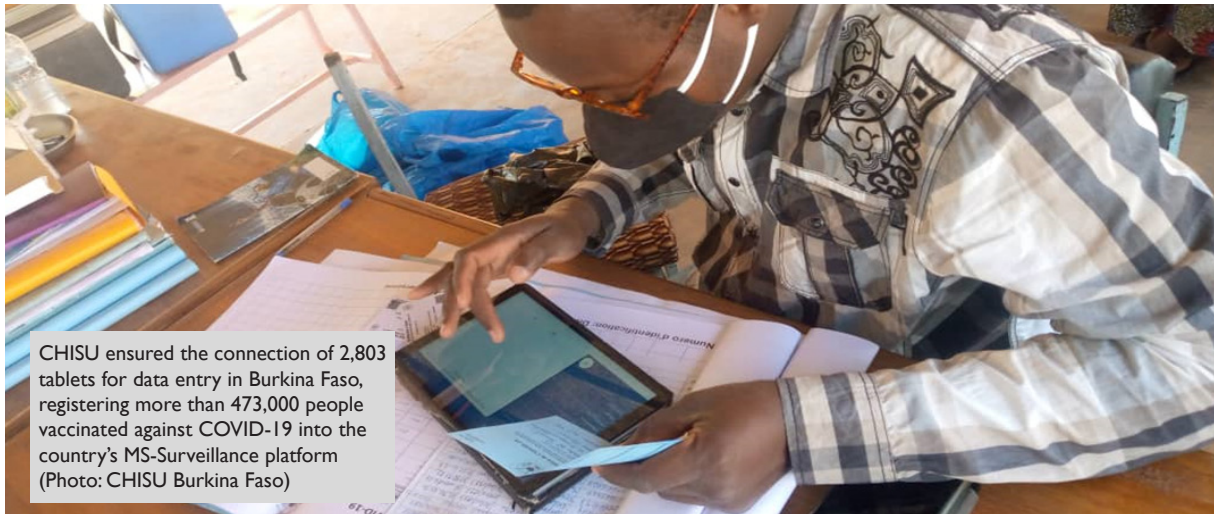
standardizing maternal and newborn health (MNH), tuberculosis (TB), and health financing data, working with stakeholders to identify the data sets, standardize the data, and develop the implementation guides for the Fast Healthcare Interoperability Resources (FHIR)

interoperability standard to integrate data into the Satu Sehat platform. The guides are expected to be launched in October 2022. The MOH also released the first guidance on electronic medical records, for which CHISU provided technical inputs.

CHISU ensured the connection of 2,803 tablets for data entry in Burkina Faso, registering more than 473,000 people vaccinated against COVID-19 into the country's MS-Surveillance platform (Photo: CHISU Burkina Faso)

FIGURE 2 - SUMMARY OF CHISU INTERVENTIONS IN SO2

Person data exchange **3%**

Networks and internet connectivity **11%**

Master facility list **3%**

ICT business infrastructure support **9%**

Hardware **9%**

Enterprise architecture **6%**

FY22 SO2 Interventions
n = 34

Terminology management **3%**

Aggregate date exchange **9%**

Business continuity and processes and policies **3%**

Data and exchange standards **6%**

Data set definitions **38%**

including manually rebuilding analytics tables to resolve missing values and resetting data types, and conducted requirements gathering for the initial design of an orphan and vulnerable children (OVC) management information system to centralize and standardize data collection and management. In **Madagascar**, CHISU supported HPHC tool adaptations and translation into Malagasy. In **Mali**, CHISU identified strengths, areas for improvement, and opportunities to support the national COVID-19 data management system in District Health Information Software version 2 (DHIS2).

To ensure reliable access to national systems, CHISU supports critical HIS ICT infrastructure. In **Burkina Faso**, CHISU provided internet connectivity for data entry in the One Health system at community level and for COVID-19 campaigns and procured ICT equipment to support data management. In **Haiti**, CHISU provided server and IT support for COVID-19 and TB trackers, *Système d'Information Sanitaire Unique* (SISNU), the national health management information system (HMIS), as well as internet connectivity for users accessing the trackers. In **Mali**, CHISU provided internet connectivity for central, regional, and health facility levels and conducted an ICT infrastructure assessment of all levels in four regions. In **Niger**, CHISU conducted an ICT infrastructure assessment of two regions and eight central-level directorates, clearly highlighting key gaps which can be addressed through different funding entities.

CHISU supports and reinforces HIS standards and core services, data exchange, and interoperability. In **Burkina Faso**, CHISU supported integration of aggregate data from other applications into ENDOS
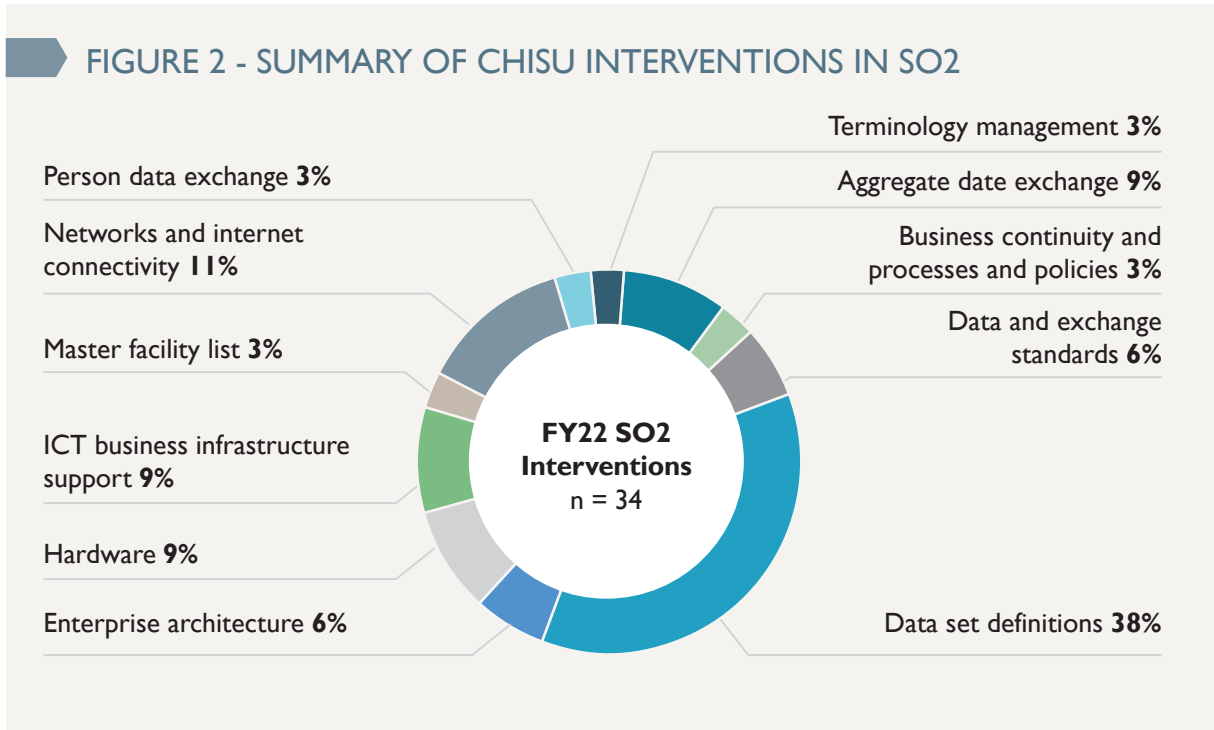
via the interoperability layer, as well as the interoperability between One Health and related COVID-19 applications. CHISU also participated in discussions on ICD-11 implementation in ENDOS through the Medical Certification of Causes of Death pilot at Ziniare Regional Hospital. CHISU led the workshop to develop application and administrator user guides for three COVID-19-related systems (MS-Surveillance, COVID INFO, and BF-SANTE). In **Indonesia**, CHISU is supporting interoperability for MNH, TB, and health financing systems in Satu Sehat to demonstrate how it can function as a data integration platform. CHISU also initiated discussions on the review of the existing enterprise architecture. In **Haiti**, CHISU provides support to integrate SISNU monitoring, evaluation, and surveillance interface (MESI) aggregate data with COVID-19 Tracker data in the national data web portal. CHISU also drafted a national health enterprise architecture and configured a prototype of the COVID-19 electronic health certificate, *passe sanitaire*, for vaccine recipients in Haiti. In **Mali**, CHISU initiated an interoperability maturity assessment.

Strategic objective 3. Data quality and use

CHISU continued work to increase demand and use of health data and information to address health priorities, gaps, and challenges in Burkina Faso, Ghana, Haiti, Indonesia, Malawi, Mali, Niger, Serbia, and the Eastern and Southern Caribbean Region (ESC) countries. CHISU is expanding the use of the **HPHC tool** with engagements with stakeholders in Ethiopia and Nigeria

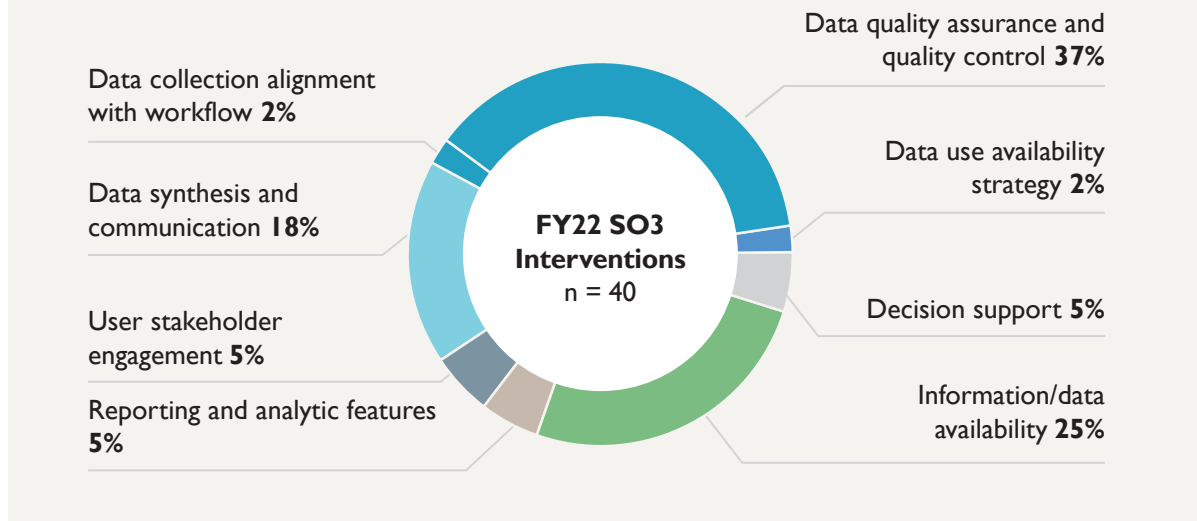## BOX 4. IMPROVEMENTS IN DATA QUALITY AND USE

Data use

- The One Health technical secretariat in Burkina Faso conducted a joint investigation of unexplained poultry mortality in two districts and reported on the One Health platform following the CHISU-developed TOR.
- Central and regional staff from the Ministries of Health, Animal Resources, and the Environment in Burkina Faso shared achievements and experiences in capacity building, data collection and processing, and data analysis and use on the One Health surveillance platform, with CHISU support.
- The national annual statistical reports for 2020 and 2021 in Haiti were developed, published, and disseminated at a launch event with CHISU support.
- Indonesia identified current and new data needs and developed dashboards for routine immunization, including disaggregation to the Puskesmas level.
- National decision makers in Mali use the CHISU-supported COVID-19 SitRep dashboard in the national DHIS2 with the help of a data analysis guide for COVID-19 decision support tools.
- CHISU developed a prototype to demonstrate how AI can be used to predict bed occupancy and allocation across health facilities in Serbia.

Data quality

- District managers in Burkina Faso are using the WHO DQR module in ENDOS to identify and correct missing, atypical, and inconsistent data with the help of a CHISU-supported user guide, training, and data review workshops.
- Health facility staff are entering monthly data in ENDOS in Burkina Faso as a result of CHISU's support for training and deployment, resulting in an increase of timeliness of reporting from 82 percent in August 2021 to 99 percent in February 2022.
- Four regions of Mali are using the WHO DQR module in the national DHIS2 to review the quality of COVID-19 data, resulting in an increase of completeness from <10 percent in May to over 90 percent at the end of September.

FIGURE 3 - SUMMARY OF CHISU INTERVENTIONS IN SO3

Data collection alignment with workflow **2%**

Data synthesis and communication **18%**

User stakeholder engagement **5%**

Reporting and analytic features **5%**

FY22 SO3 Interventions n = 40

Data quality assurance and quality control **37%**

Data use availability strategy **2%**

Decision support **5%**

Information/data availability **25%**

Central East, North, Southeast, and Southwest). After completing a data use needs assessment in **Indonesia**, CHISU identified a model for a data use capacity strengthening program at national and subnational levels. CHISU also conducted key informant interviews and hosted a data use capacity strengthening curriculum validation workshop to review findings of the needs assessment and validate the design of the curriculum. In **Serbia**, after drafting the data use needs assessment report, CHISU held a workshop to collect feedback from stakeholders on identified gaps in data use.

CHISU conducted data quality review (DQR) meetings in **Burkina Faso**, **Haiti**, **Mali**, and **Niger**, using the WHO DQR app in DHIS2 in all countries except Haiti, and conducted data quality assessments (DQA) in **Ghana** and **Malawi**. In **Mali**, CHISU supported the development of a DQA plan with special focus on COVID-19. CHISU supported data analysis for improved data quality in **Mali** and **Niger**. In **Niger**, CHISU analyzed data for Zinder and Maradi Regions, focusing on the data quality dimensions of completeness (of reports and data points) and timeliness. By sharing the findings from this analysis with stakeholders, CHISU saw improvement in data quality, and Directorate of Statistics staff are using it for other regional health directorates.

CHISU conducted data quality improvement training in **Ghana** for 96 people in the Greater Accra Region. District staff developed data quality improvement actions plans during the training with implementation starting shortly after. In **Malawi**, CHISU, NMCP, CMED,

for future tool use. CHISU conducted a review of **digital supportive supervision** frameworks, tools, and programs, and initiated development of the data quality annex of the revised WHO **Reproductive maternal, newborn, child and adolescent health (RMNCAH) Use of Facility Data Guidelines**. CHISU also initiated an activity focused on **community based information systems (CBIS) guidance in PMI countries** – classifying the components of 20 documents, as follows: information systems development; governance; data analysis; data use/quality; standards and interoperability; sharing and using; and data security, privacy, and confidentiality. See Figure 3 for a summary of CHISU interventions in SO3.

CHISU supported data use training, data review meetings, and data use needs assessments in many countries. CHISU trained regional health directors in **Burkina Faso** on the use of data in ENDOS and organized a national workshop to review data and share experiences on One Health surveillance implemented in the two intervention regions (Center West and Boucle du Mouhoun). CHISU led a training on malaria data analysis, interpretation, visualization, and use in the six districts of **Ghana** earmarked for malaria pre-elimination. In **Malawi**, CHISU supported the Central Monitoring and Evaluation Division (CMED) and the National Malaria Control Program (NMCP) in implementing integrated program data reviews in five zones (Central West,

and Digital Health Division (DHD) implemented malaria-specific facility-level data quality verification, staff mentorship, and data modification in the DHIS2. The intervention trained 72 district-level participants and covered 263 facilities in eight targeted districts. CHISU also supported integration of digital health records in **Indonesia** for example hospital information systems TB drug prescribing and dispensing reporting data. CHISU implemented supportive supervision activities in **Burkina Faso** and **Malawi** to improve the quality of data, its entry into electronic platforms, analysis, and preparation of reports. In **Mali**, CHISU developed a COVID-19 data analysis guide that helps key decision makers use customized decision support tools (dashboards). In **Indonesia**, CHISU supported the Satu Data Satu Dashboard; national- and puskesmas-level monitoring dashboards; Child Immunization Month; and polio drop and PCV immunization. In **Serbia**, CHISU developed a prototype to demonstrate how AI can be leveraged to predict bed occupancy and allocation needs across health facilities, which was well received by the government. CHISU was asked to subsequently focus on a different use case (waiting list optimization for scheduled imaging diagnostics services, specifically CT and MRI), which is considered higher priority to demonstrate the implementation of the national AI strategy and the effect of AI in data use for decision making by the government, and will be addressed in the next year.

In Indonesia, CHISU supported the development of the Satu Sehat platform, as well as national- and puskesmas-level monitoring dashboards (Photo: CHISU Indonesia)