

Strategic Information

A key challenge to the prevention, care, and treatment of HIV and other infectious diseases is constrained strategic information. Inadequate data hampers access to and use of information for improved delivery of critical health services and care, adversely affect evidence-based programmatic decision-making, and impair tracking of progress against health targets. Systems that support strategic information are vital to increase program effectiveness and efficiency, enable the use of data for decision-making, inform policies, mobilize resources, and monitor and validate program outcomes toward epidemic control and quality patient care.

Strategic information is high-quality, reliable evidence and data that have been effectively collected and used to improve all levels of health programs and, ultimately, patient care.

In order to meet, and exceed, global targets and accelerate epidemic control, countries need accurate and reliable strategic information at every level of the health system. Critical elements include integrated and strengthened health information systems (HIS), effective monitoring and evaluation (M&E) and disease surveillance systems, and solid implementation science that guides continual programmatic improvements and scale-up.

I-TECH CAPACITY

For nearly two decades, the International Training and Education Center for Health (I-TECH) has worked with ministries of health, non-governmental organizations, medical facilities, and other implementing partners to strengthen national health systems and national government responses to HIV and other infectious diseases. With its network of in-country offices, as well as the Digital Initiatives Group at I-TECH (DIGI), I-TECH unites an expansive network of academic and global expertise related to HIS, disease surveillance, M&E, and implementation science. Layering research with practice, building capacity, and developing national standards for data transfer and system operability, I-TECH promotes a culture of using data for decision making.

Providing Health Planners and Workers with Data for Decision Making

DIGI, I-TECH's team of digital health experts, builds on 15 years of experience designing, developing, implementing, and evaluating HIS around the world to help Ministries of Health (MOH) and their collaborators to improve health outcomes. Through DIGI, I-TECH develops and deploys systems and provides technical assistance and training on electronic medical records, laboratory information systems (LIS), disease surveillance, national eHealth architecture design, national standards for data transfer and system interoperability, and data use for improved clinical service delivery and high-level policymaking. For more information on DIGI's work, see the I-TECH **Health Information Systems** technical brief and **DIGI Projects & Products**.

Health information systems (HIS) are systems designed to manage health care data. These systems are numerous, ranging from electronic medical records (EMR) systems to mHealth, which is the practice of medicine and public health supported by mobile devices.

Strengthening Data Systems to Improve Program Performance

I-TECH's team of M&E specialists work to ensure the efficacy of training and programmatic interventions by applying their expertise in cost analysis, data collection, and measurement to rigorous evaluations of these interventions. Monitoring ongoing projects and programs allows for midstream corrections; key findings are communicated to managers and leaders to improve programmatic decision making. Results are disseminated through publication, when appropriate.

With monitoring, specialists routinely gather information for tracking progress against plans and design ways to correct discrepancies. Evaluation focuses on specific questions related to effectiveness and impact in order to influence future programs or services.[†]

[†]A UNICEF Guide for Monitoring and Evaluation, 1991

Linkage to care following HIV counseling and testing (HCT) remains low in **South Africa**. A review of community-based HIV testing programs noted that follow-up through a peer or counselor improved rates of linkage. The aim of the HIV self-screening for men study was to reach high-risk men, reporting HIV-negative or unknown status in the high burden area of City of Johannesburg District, Gauteng Province, through distribution of HIV self-screening (HIVSS) and provision of assisted linkage to care by community health workers (CHWs). The goal was to demonstrate the feasibility and assess the operational elements and utility of HIVSS distribution and assisted linkage by ward-based primary health care outreach team CHWs and outreach team leaders (OTLs) for increasing uptake of HIV testing and treatment initiation among undiagnosed HIV-positive men in South Africa.

I-TECH's M&E team in **Ukraine** support sites in implementing a national index testing program, assuring quality and measuring program outputs. The M&E team utilizes various data sources for this purpose, including an HIV Health Management Information System (HIV MIS), the data from which is triangulated with paper-based index testing case files and an index testing register, where sites enter data from point of care. The team also conducts monthly site visit reports to review progress; forms for adverse event reporting and investigation; records on in-service trainings of doctors, nurses, and other staff working on HIV testing and linkage to care; and quarterly Data Quality Assessment (DQA) reports for each of the 39 focus sites.

At the invitation of the Mozambican Ministry of Health, I-TECH provided technical assistance to improve the quality of education for *Técnicos de Medicina Geral* (TMGs), a cadre of mid-level clinicians. The TMG Scope of Practice was updated to reflect the realities of the practice environment and epidemiological patterns in **Mozambique**. Together, representatives from the MOH and I-TECH undertook a curriculum revision process to increase emphasis on clinical skills, standardize content and methodology between instructors and institutions, and integrate HIV and AIDS content. In September 2014, I-TECH finished a three-year assessment to determine the impact of the revised pre-service curriculum on the clinical competencies and knowledge levels of TMs, compared to those graduating from the existing pre-service curriculum.



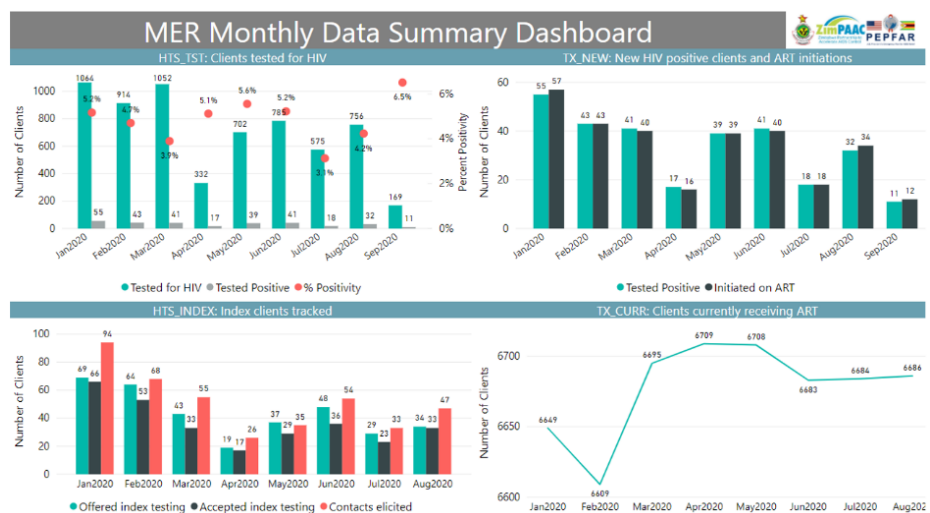
In **Botswana**, to monitor HIV testing services within health facilities across the country, I-TECH developed a real-time, SMS-based reporting system for rapid detection of key service delivery challenges such as stockouts and hotspots, as well as a tablet-based system to capture client-level data and support reporting. The team also rolled out and transitioned the national patient-level tuberculosis health information system to increase efficiency in identification, care, and treatment of patients.

Since 2013, the ZAZIC consortium—which includes I-TECH’s network partner in **Zimbabwe**, the Zimbabwe Training, Technical Assistance, and Education Center for Health (Zim-TTECH)—has supported the Zimbabwe Ministry of Health and Child Care (MOHCC) to implement a high-quality, integrated voluntary medical male circumcision (VMMC) program in 13 districts. With the aim of significantly lowering global HIV rates, prevention programs like VMMC make every effort to achieve ambitious targets at an increasingly reduced cost. This has the potential to threaten VMMC program quality. Two measures of program quality are follow-up and adverse event (AE) rates. To inform further VMMC program improvement, ZAZIC conducted a quality assurance (QA) activity to assess if pressure to do more with less influenced program quality.¹ Key informants noted three areas of diminished adherence to VMMC safety standards: 1) For pre- and post-operative counseling, MC teams may combine individual and group sessions to reach more people, potentially reducing client understanding of critical wound care instruction; 2) Key infection control practices may be compromised (handwashing, scrubbing techniques, and preoperative client preparation) to speed MC procedures; 3) Pressure for client numbers may reduce prioritization of patient follow-up, while client-perceived stigma may reduce care-seeking. Although AEs appear well managed, delays in AE identification and lack of consistent AE reporting compromise program quality.

I-TECH has implemented **large-scale SI training programs** to build HIS-related competencies among health program managers, IT personnel, software developers, and facility-level HCWs. For example, I-TECH’s HIS training program in **Kenya** used a champion mentor model and built capacity for ongoing training delivery and user support with county health management teams and PEPFAR service delivery partners. I-TECH’s M&E team also established, trained, and mentored the District M&E Officer cadre in **Botswana** and facility, district, and national M&E staff in **Malawi**.

Zim-TTECH also developed ZDIP, a robust data collection and visualization system for HIV care and treatment indicators and reporting to funders. ZDIP was developed through a close collaboration with DIGI and with support from outside consults. The system uses tablet-based data collection tools and dashboards to track and inform progress. Objectives of ZDIP were to create an M&E system that would decentralize data entry; reduce manual data manipulation; and improve the dissemination of data to facilitate use. The system now holds five months’ worth of accurate data.

ZDIP Dashboard Data Visualization



¹ Feldacker C, Murenje V, Makunike-Chikwinya B, Hove J, Munyaradzi T, Marongwe P, Balachandra S, Mandisarisa J, Holec M, Xaba S, Sidile-Chitimbi V, Tshimanga M, Barnhart S. Balancing competing priorities: Quantity versus quality within a routine, voluntary medical male circumcision program operating at scale in Zimbabwe. PLoS One. 2020 Oct 13;15(10):e0240425. doi: 10.1371/journal.pone.0240425.

Conducting Research to Inform Effective Program Implementation

I-TECH has world-renowned capacity in implementation science, capitalizing on its strength to train students and health care professionals to identify, analyze, and interpret data focusing on closing the “know-do” gap. Specifically, I-TECH leverages ongoing curricula and models in place throughout the University of Washington Department of Global Health (DGH) centers including 1) formal implementation science methodologic short courses with a follow-on twinned mentorship model and 2) data analysis workshops that focus on hands-on data analysis, interpretation, and action planning for program and policy makers. Existing online coursework offerings from DGH cover topics ranging from strengthening field epidemiology and surveillance to certificates in data visualization and implementation science.

Disease surveillance is the ongoing, systematic collection and analysis of data and information to prevent and control a disease, usually an infectious disease.

For example, ***Online Fundamentals of Implementation Science*** is an interactive, online course that enables students to use a systematic, scientific approach to find out “what works” and convey this information with greater speed, fidelity, quality, and efficiency to those who need it. Students learn how to translate scientific research and data into on-the-ground policies and programs.

From 2014 to 2016, the I-TECH Laboratory Systems Strengthening team recruited four laboratory technicians in **Cambodia** to be mentors and trained them in mentoring skills, laboratory quality management practices, and international standard organization (ISO) 15189 requirements for medical laboratories.² Separately, they trained staff from 12 referral hospital laboratories in laboratory quality management systems implementation using the laboratory quality stepwise implementation (LQSI) tool. The study concluded that on-site mentoring of laboratories using a detailed action plan in the local language allows staff to learn the concepts of a quality management system, on the job and without disruption to laboratory service provision.

In 2017, I-TECH conducted a randomized controlled trial (RCT) using two-way texting (2wT) for post-operative follow up in **Zimbabwe**’s voluntary medical male circumcision (VMMC) program.³ Using 2wT, I-TECH’s approach reduced in-person visits by 85%, increased identification of complications, and cut follow-up costs, suggesting that 2wT could make a dramatic difference in VMMC programs operating at scale. Additionally, both patients and providers found the approach highly usable and acceptable. Based on the results, I-TECH will scale-up 2wT in Malawi and South Africa.

To promote HIV antiretroviral therapy (ART) outcomes in **Haiti**, I-TECH developed a culturally relevant intervention (InfoPlus Adherence) that combines an EMR alert identifying patients at elevated risk of treatment failure and provider-delivered brief problem-solving counseling.⁴ I-TECH conducted a quasi-experimental mixed-methods study among 146 patients at two large ART clinics in Haiti with 728 historical controls. We conducted quantitative assessments of patients at baseline and intervention completion (6 months) as well as focus groups with health workers and exit interviews with patients. Qualitative data affirmed acceptability of the

² Perrone LA, Voerung V, Sek S, Song S, Vong N, Tous C, Flandin JF, Confer D, Costa A, Martin R. Implementation research: a mentoring programme to improve laboratory quality in Cambodia. *Bull World Health Organ.* 2016;94:743–751. doi: <http://dx.doi.org/10.2471/BLT.15.163824>

³ Feldacker C, Holeman I, Murenje V, Xaba S, Korir M, Wambua B, Makunike-Chikwinya B, Holec M, Barnhart S, Tshimanga M. Usability and acceptability of a two-way texting intervention for post-operative follow-up for voluntary medical male circumcision in Zimbabwe. *PLoS One.* 2020 Jun 16;15(6):e0233234. doi: 10.1371/journal.pone.0233234.

⁴ Puttkammer N, Simoni JM, Sandifer T, et al. An EMR-Based Alert with Brief Provider-Led ART Adherence Counseling: Promising Results of the InfoPlus Adherence Pilot Study Among Haitian Adults with HIV Initiating ART. *AIDS Behav.* 2020; [published online ahead of print, 2020 Jul 26]. doi:10.1007/s10461-020-02945-8

intervention, although providers reported some challenges consistently implementing it. Future research is needed to demonstrate efficacy and explore optimal implementation strategies.

Improving Data Quality

In **Namibia**, I-TECH is leading efforts on the improvement of data quality and use of data to improve clinical decision-making. This includes working at the site level to build awareness and buy-in for data quality and use among site-level management and HCWs.

Routine Data Quality Assessments (RDQAs) were developed to measure and improve facility-level electronic medical record (EMR) data quality. In **Kenya**, I-TECH assessed if RDQAs were associated with improvements in data quality in the I-TECH-developed KenyaEMR, an HIV care and treatment EMR used at 341 facilities in Kenya.⁵ RDQAs assess data quality by comparing information recorded in paper records to KenyaEMR. RDQAs are conducted during a one-day site visit, where approximately 100 records are randomly selected and 24 data elements are reviewed to assess data completeness and concordance. I-TECH's findings were that RDQAs can be implemented on a large scale and used to identify EMR data quality problems. RDQAs were associated with meaningful improvements in data quality and could be adapted for implementation in other settings.

In partnership with CDC, I-TECH network partner in **Haiti**, CHARESS, helps the Haitian MSPP to implement the national care improvement program, HealthQual, by training providers on quality improvement concepts and using data from the EMR, iSanté, for clinical decision making and improved care. CHARESS mentors are coaches for the implementation of quality improvement projects in the 20 sites where CHARESS also provides technical assistance.

I-TECH's 2017 *Health Information Management and Applied Epidemiology (HIMAE)* course was a training (10 self-paced learning modules, available in eLearning and workbook format) designed to increase the capacity of clinic and public health personnel to generate and utilize facility-level data for national HIV, STI, and tuberculosis indicators.

I-TECH has coordinated and provided assurance of **national data quality improvement initiatives** in **Botswana**, focused on 95-95-95 targets. This included developing national, district, and site-based CQI collaboratives, facilitating best practices forums, and supporting the implementation of new evidence-based policy initiatives.



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February 2021

⁵ Muthee V, Bochner AF, Osterman A, Liku N, Akhwale W, Kwach J, Prachi M, Wamicwe J, Odhiambo J, Onyango F, Puttkammer N. The impact of routine data quality assessments on electronic medical record data quality in Kenya. PLoS One. 2018 Apr 18;13(4). doi: 10.1371/journal.pone.0195362