

Annex D: Case Study on the Health Network Quality Improvement System (HNQIS)

This case study is part of the USAID-funded Human Resources for Health in 2030 (HRH2030) Program's [Enhanced Supervision Approaches: Phase I Landscape Analysis Report](#). It was developed based on the cited literature, as well as key informant interviews conducted by phone in November 2018 with Population Services International staff in Kenya and Cambodia and through exploration of the Health Network Quality Improvement System application demo, downloaded from [Google Play](#). It has been reformatted and edited.

Introduction

To enhance supervision for private and public sector providers, Population Services International (PSI) developed the Health Network Quality Improvement System (HNQIS). HNQIS was designed to address health system challenges and constraints related to monitoring and improvement of quality of care in LMICs, in particular across networks of private providers, such as social franchises or private outlets, and community-based health workers. It is an electronic tablet-based application used to improve quality of health services and effectively reach health impact at scale.

The HNQIS is composed of four modules that support healthcare supervisors to: (1) **plan** supervision visits, using a prioritization matrix that presents facility-specific quality scores and patient volume, (2) **assess** providers' quality of care against clinical standards, (3) **improve** providers' quality of care through tailored feedback, and (4) **monitor** quality improvements over time. HNQIS was developed to link with HMIS data from the District Health Information Software 2 (DHIS2) which is free and open-source. HNQIS assists teams to assess quality of care of providers' services to measure provider proficiencies in respective skills, and to highlight and monitor identified areas for improvement.

CONTEXT

Macro-Level Factors

In many LMIC health systems, while data are abundantly produced, there is limited interoperability and use to inform health worker performance support. Governments have invested in DHIS2, but the robustness, completeness, and timeliness of DHIS2 data remains limited in many contexts. Further, the application or use of available health systems data across multiple data streams has not reached its full potential. Private sector networks struggle to ensure compliance from individual providers.

Micro- & Individual Level

At the workplace or facility level, "key constraints for monitoring and improving quality of care in lower and middle-income countries include the lack of enforcement of standards of clinical procedures, lack of or delayed performance feedback, and poor use of monitoring data to prioritize supervision visits where they are most needed¹. Per

TABLE 6. HNQIS IMPLEMENTATION BY COUNTRY, HEALTH AREA, AND CONTEXT

COUNTRY	YEAR STARTED	HEALTH PROGRAM AREAS			PUBLIC / PRIVATE	# OF FACILITIES SUPERVISED*
		MALARIA	FP	OTHER*		
Angola	2018	X	X	PAC, WEA	Both	30
Benin	2018	X	X	CC, PAC, WEA	Private	60
Burundi	2018	X	X	HIV, PAC	Private	228
Cambodia	2016	X	X	WEA	Private	1,433
Cameroon	2018	X	X	CC, HIV, HT	Private	300
DRC	2017	X	X	IMCI	Private	189
Kenya	2015	X	X	CC, HIV, HT, IMCI, MNH, VMMC, Newborn resuscitation, TB, WEA	Private	327
Laos	2017	X	X		Private	276
Madagascar	2017	X	X	PAC	Private	392
Malawi	2018	X	X	CC, HIV, HT, IMCI, MNH, VMMC	Private	299
Mali	2017	X	X	CC, PAC, WEA	Both	363
Mozambique	2017	X	X		Both	60
Myanmar	2016	X	X		Private	4,000
Nepal	2019	X	X	PBCC, PAC, WEA	Private	300
Nigeria	2016	X	X	CC, HIV, HT, IMCI, WEA	Private	342
Tanzania	2016	X	X	CC, IMCI, PAC, WEA	Private	205
Uganda	2015	X	X	CC, MNH, Newborn resuscitation, PAC, WEA	Private	172
Vietnam	2018	X		HT	Private	350
Zimbabwe	2017			VMMC	Both	173

Other health program acronyms
 CC = cervical cancer
 HT = hypertension
 MNH = maternal and newborn health
 PAC = post-abortion care
 PBCC = provider behavior change communication
 VMMC = voluntary male medical circumcision
 WEA = work environment assessment

*In some cases, facilities have one provider; in others more than one provider is assessed at the same facility.

key informants, HNQIS was introduced to address the efficiency gaps of a paper-based system; data collection, entry, and management were all time-consuming.

Geographic & Health Areas

HNQIS has been customized and implemented in diverse contexts across 19 countries in sub-Saharan Africa and Asia to reinforce standards of care across 13 different health areas. In addition to the implementation experiences described in Table 6 above, HNQIS will go “live” in Ghana in June 2019 and in Côte d’Ivoire by the end of 2019; other countries for anticipated roll-out include Bangladesh, Ethiopia, Niger, Somaliland, and South Africa.

Study Type

HNQIS implementation results are documented in poster presentations¹, programmatic reports on PSI’s website,^{2,3} blogs,⁴ and as well as at conference fora.^{5,6}

As shown in Figure 6, the HRH2030 landscape analysis conceptual framework can be applied to HNQIS to illustrate the components of the enhanced supervision approach.

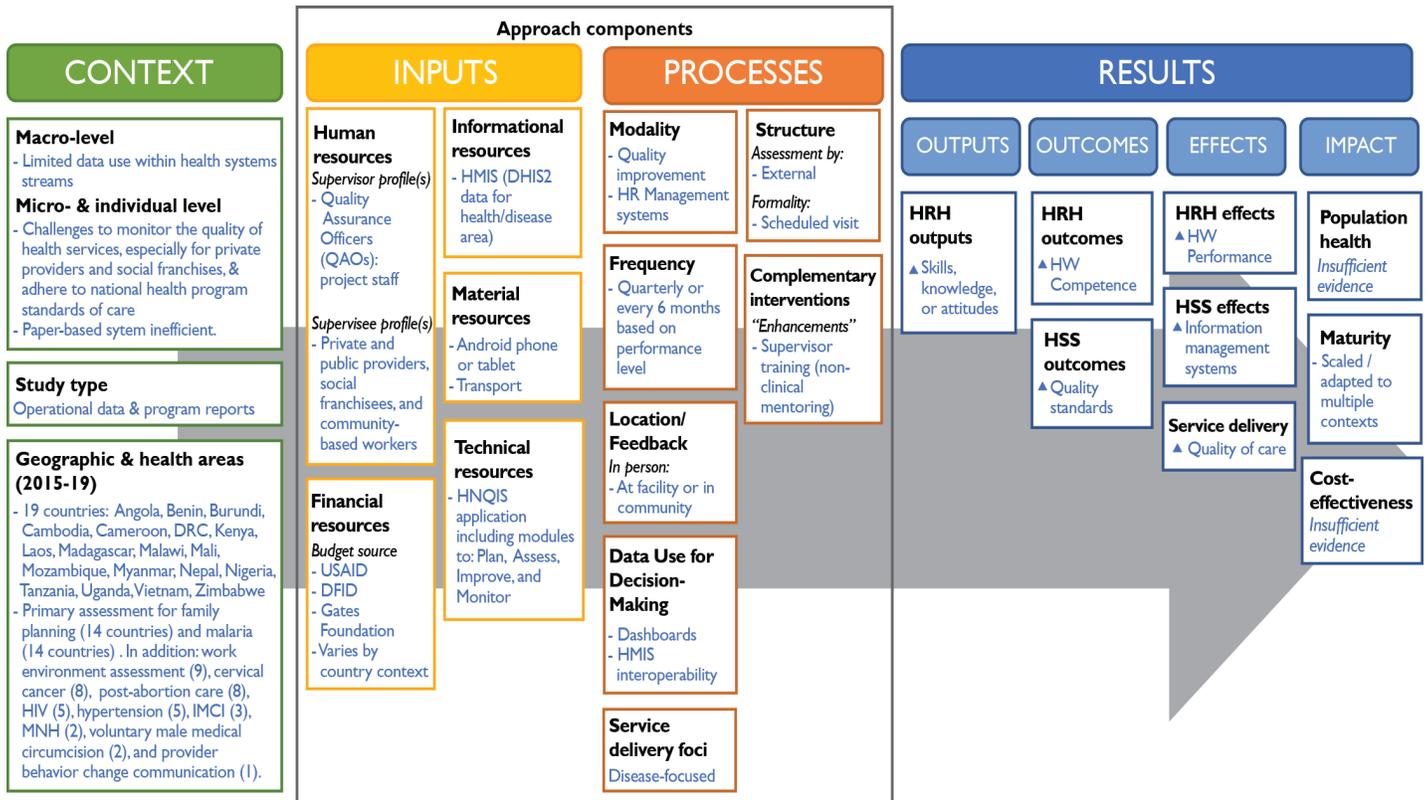
INPUTS

Inputs for the HNQIS enhanced supervision approach were classified by type: human resources, financial, informational, equipment, supplies, and technical inputs.

Human Resources

Supervisor – Quality Assurance Officers (QAOs) are the primary supervisors and implementers of the HNQIS approach across PSI sites. They are project staff assigned to monitoring implementation of PSI/partner projects. QAOs are trained to use the HNQIS app; their main responsibility is to plan, assess, monitor, and follow-up with providers using HNQIS as a supervisory tool. The supervisor trainers are also project staff from PSI and partners.

FIGURE 6. HNQIS ENHANCED SUPERVISION IMPLEMENTATION



Source: HRH2030 2019. Adapted from Dieleman et al. 2009, GHWA, and informed by Campbell et al. 2013.

Supervisee – Supervisees (also referred to as mentees) were hospital and HC nurses, most of whom were trained to the A2 level.

Financial

The HNQIS software application was developed with support from the Department for International Development (DFID) of Great Britain and the Minister for Foreign Trade and Development Cooperation of the Netherlands. It is made possible by the support from USAID. HNQIS funding varies for each country and includes support from both donor and domestic funding. For example, Cambodia HNQIS is implemented with support from USAID, DFID, and the Gates Foundation.

Informational Resources

Informational resources used in the HNQIS approach are largely from digital health worker performance data stored in the HNQIS application, as well as other HMIS data (e.g., DHIS2). At the central level, project staff use the HNQIS system to also monitor supervisors by checking information such as number of visits made by the QAOs to providers and patient volumes (see Figure 10a).

Material Resources

The primary material resources for HNQIS are Android smart phones or tablets to download and use the HNQIS application itself, as well as transport to supervision sites. In most contexts, PSI has provided Android phones. HNQIS works offline, so consistent connectivity is not required; it is needed only to send data upon completion of the assessment, or on a routine basis (e.g., daily or weekly) to upload all assessment completed during the period (i.e., in Mozambique, the team uploads data on a weekly basis).

Technical Resources

The HNQIS application is Android-based and was developed by PSI in collaboration with EyeSeeTea, Ltd and KnowTechTure (KTT), who developed the Android codes and made the link with DHIS2; BAO Systems supports DHIS2 server configuration to “host” the application.

In each country and for each health program area, the HNQIS content and algorithms must be customized within the standard modular process and according to national guidelines:

- **Module 1: Plan** supervision visits using a prioritization matrix that reckons quality scores and patient volume. (See Figure 7.)
- **Module 2: Assess** supervisees’ quality of care against national clinical standards using a checklist. (See Figure 8.) Within the checklist, some questions are compulsory to ensure comparability of scores across providers and over time by using a set of minimum standards for comparison.
- **Module 3: Improve** supervisees’ quality of care through tailored feedback, which is based on defined standards and guides the supervisor to deliver specific, relevant, constructive, facilitative support while also promoting quality services. (See Figure 9.)
- **Module 4: Monitor** quality improvement over time. Data dashboards for this module should be customized. Supervisors access the program’s DHIS2 instance to review population health data alongside HNQIS’s interoperable health worker performance data. (See Figure 10)

PROCESSES

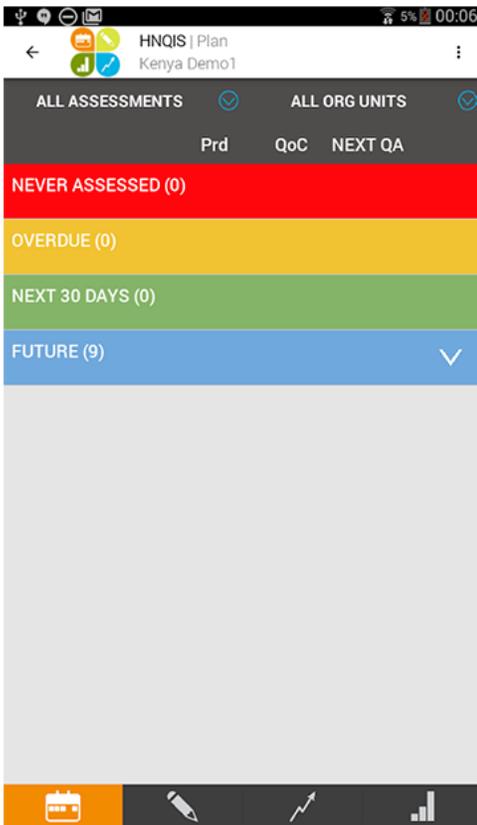
Modality & Intervention Type

HNQIS assists **quality improvement** teams to assess quality of care of providers’ services, to measure provider proficiencies in respective skills, and to highlight missed critical steps. QAOs use the HNQIS app to calculate the quality of care scores for providers in their networks, to schedule support visits, and to prioritize provider support. HNQIS serves as a human resources management tool, given its visit-scheduling functions.

The HNQIS process is guided by four modules to support supervisors through the **plan-assess-improve-monitor** cycle. The process is consistent for HNQIS application around the world, though scheduling criteria, QoC threshold scores, feedback, and data dashboards for monitoring may vary based on context and need.

From start-up to implementation, the step-wise customization process is: respond to the expression of interest; develop the QA checklist for service areas; configure the checklist within app; implement user testing; release the

FIGURES 7A, 7B, AND 7C. HNQIS MODULE 1: PLAN



7a. Initial Plan Screen

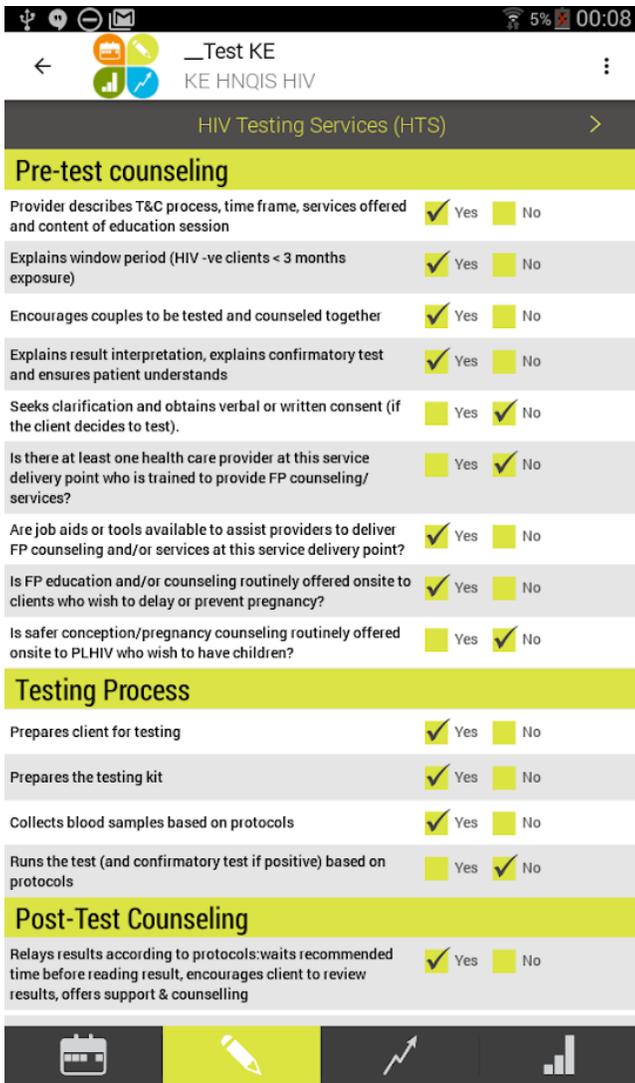


7b. Schedule of future visits showing service scores and next planned visit

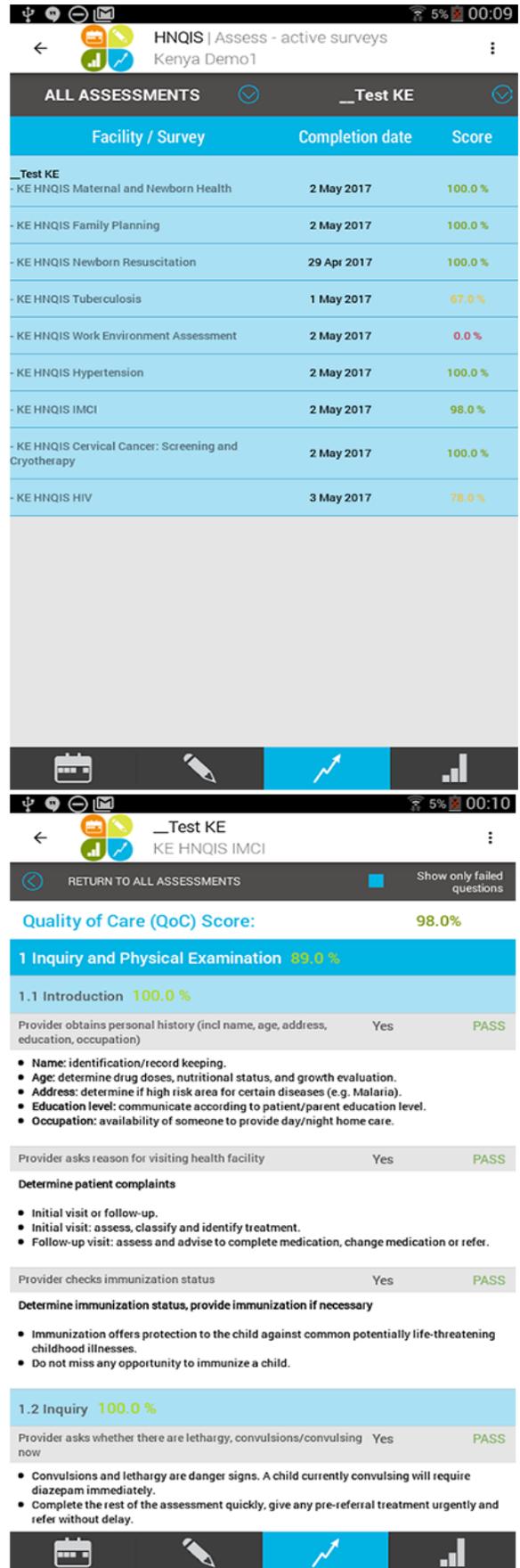


7c. Supervision reschedule, service, and date

FIGURE 8. HNQIS MODULE 2: ASSESS



FIGURES 9A & 9B. HNQIS MODULE 3: IMPROVE



final country version of HNQIS; subsequently, launch and roll-out to QAO supervisors; and, finally, conduct end-user and analytics training. When transitioning from paper-based to digital supervision reporting using HNQIS, in several country contexts supervisors preferred using both reporting mechanisms (paper and digital) until they gained confidence in HNQIS data capture.

Structure, Location, Frequency & Feedback

Plan: On-site external supervision visits can be scheduled in the HNQIS plan module in increments of **three or six months based on performance levels**, with lower-performing facilities and providers receiving more frequent visits. However, during key informant interviews, it was suggested that in Cambodia, supervisors maintain a regular quarterly schedule for all facilities. The rationale was to continue providing motivation and attention to high-performers, who appreciated the support.

Assess: The service checklists are used to observe supervisees. In most cases, observations and feedback are for **individual** health workers, while in some country contexts, checklists have been adapted to accommodate **health worker teams**.

Improve: The HNQIS app provides **immediate feedback** by calculating a quality of care score (QoC), which is displayed to the supervisor with a prompt to share results with the supervisee. Specific points of feedback are developed based on algorithms to deliver instructive recommendations and areas for improvement according to national standards. Then collaborative **action planning** takes place to identify how the supervisee will make improvements. In Cambodia feedback includes links to technical videos, so that a supervisor may choose to play them for a supervisee for targeted and immediate on-the-job-training. Figure 9 shows screenshots of QoC scores and feedback that supervisors can use to guide their conversations with supervisees.

Service Delivery Foci

Per Table 6, the service delivery foci for supervisors varies by country. For some programs, the supervisor evaluates only one or two **disease-focused** service areas, while in others, it is more **integrated**. However, it should be noted that due to the time it takes to observe each service area, providing integrated supportive supervision across services would take more than one day.

Data Use for Decision Making

Monitor: The fourth HNQIS module displays health facility and supervisee performance data; the app's **HMIS interoperability**, achieved by geocoding all facilities to link

to real-time data in DHIS2, facilitates more timely performance monitoring, including supervisor performance. Figure 10 shows sample monitoring dashboards where providers are classified by QoC scores (10b).

Complementary Interventions

A complementary enhancement to implement HNQIS is non-clinical supervisor training to ensure effective use of the application; the QAOs were already selected based on clinical competence.

RESULTS

HRH Outputs

- **Increased skills, knowledge, or attitudes:** The QoC scores for each supervisee can be tracked to show improvements in terms of observed skills to provide services according to defined standards of care. Figure 11 notes these improvements, with a larger proportion of supervisees achieving “Class A,” where they meet 80 percent or more of the quality standards of care.

HRH & HSS Outcomes

- **Increased health worker competence and health worker responsiveness** as a result of applying HNQIS, as described by key informants and evidence in Figure 11.
- **Improved quality standards:** Overlaying HMIS data—such as disease surveillance, patient load, and commodity availability—with supervisee performance indicators allowed supervisors to monitor and achieve higher quality standards.

FIGURES 10A & 10B. HNQIS MODULE 4: MONITOR

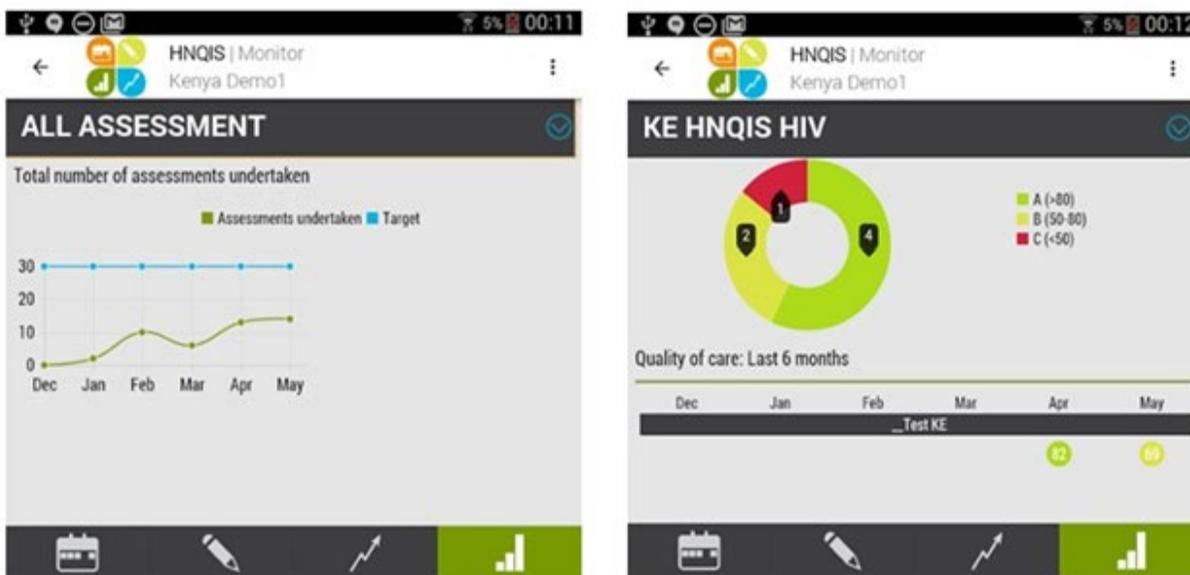
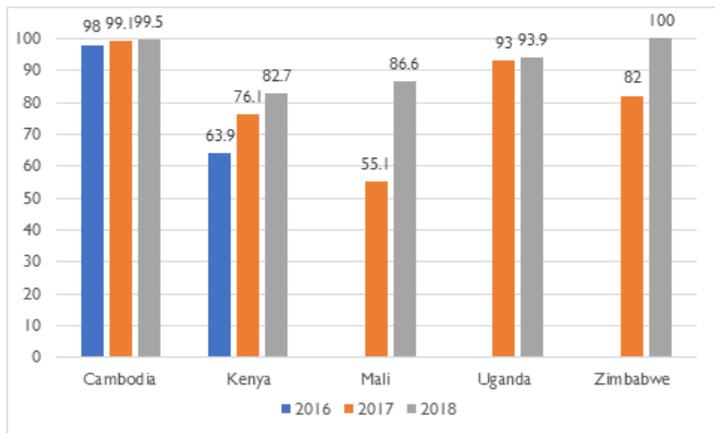


FIGURE 11. PERCENTAGE OF FAMILY PLANNING PROVIDERS IN CLASS A (≥80%) FOR QOC SCORES FROM HNQIS ASSESSMENTS



HRH & HSS Effects

- Increased health workforce performance:** This is linked to the service delivery effects and improved quality evidenced by Figure 11 and reinforced through key informant interviews. For example, in Cambodia the supervisors' use of HNQIS dashboards contributed to improved productivity among malaria and family planning program staff due to faster collection, use, and analysis of program data compared to the pre-2016 period when the process was only paper-based.
- Improved efficiency:** Due to the reduced workload of data collection, entry, and management, key informants observed a large reduction in the supervisory workforce needed. For example, in Cambodia after HNQIS implementation fewer supervisors could manage more supervisee providers.

Service Delivery Effects & Population Health

- Improved quality of care:** QoC scores from HNQIS assessments were documented for family planning in Cambodia, Kenya, Mali, Uganda, and Zimbabwe from 2016 to 2018 and increased during that time. (Figure 11)

There is anecdotal evidence of improved service delivery efficiencies on the basis of the ease in data sharing and use of the HNQIS monitoring dashboard. There is not yet sufficient evidence to attribute improved population health outcomes to HNQIS implementation, though such

studies could be undertaken with relative ease given the systems' HMIS interoperability.

Maturity & Adaptability to Multiple Contexts

HNQIS has been **scaled** and **adapted** for implementation in **19 countries** and with supervisory checklists for at least **77 country-specific service areas** to support more than **8,000 health service providers** through **31,000 supervisory assessments** as of March 2019.

Cost Effectiveness

There is currently insufficient evidence provided on the cost-effectiveness of HNQIS.

As reflected in the landscape analysis, it is exceptional within the literature that an enhanced supervision approach was applied in such a range of contexts and for so many service areas. Additional evidence on how HNQIS can be sustained and scaled, especially within the public sector and for community-based health workers, could help inform country stakeholders with important considerations for investing in enhanced supervision approaches.

Into the future, it is envisioned that HNQIS features will be moved into 'core DHIS2', so that the custom Android app will no longer be needed. Instead, DHIS2 users around the world can download a 'metadata package' (e.g., the DHIS2 app) directly from their respective DHIS2 instances and use it to conduct QI-focused supportive supervision visits.

As reflected in the landscape analysis, it is exceptional within the literature that an enhanced supervision approach was documented from development through implementation, scale, and adaptation to additional contexts.

¹ Lussiana, C. et al. (2016) 'Addressing Quality Improvement of Health Service Provision in DHIS2: How Technology Advancements are Driving,' DHIS2 Academy Presentation, p. 2.

² <https://mis.psi.org/using-dhis2-to-improve-health-service-quality/?lang=en>

³ <https://mis.psi.org/where-is-hnqis/?lang=en>

⁴ https://docs.dhis2.org/2.25/en/user-stories/html/user_story_psi.html

⁵ <https://dhis2symposium2018.sched.com/event/Diyc/the-future-of-hnqis>

⁶ https://www.globaldigitalhealthnetwork.org/sites/mhealthwg.org/files/rebecca_potter_-_harnessing_dhis2_for_malaria_surveillance_psi_potter_12-5-17_1.pdf



Health workers in Grand Yoff General Hospital, Senegal. Photo credit: Michelle Byamugisha, Chemonics (2018)

Program Partners

- Chemonics International
- American International Health Alliance (AIHA)
- Amref Health Africa
- Open Development
- Palladium
- ThinkWell
- University Research Company (URC)

About HRH2030

HRH2030 strives to build the accessible, available, acceptable, and high-quality health workforce needed to improve health outcomes.

Global Program Objectives

1. **Improve performance and productivity of the health workforce.** Improve service delivery models, strengthen in-service training capacity and continuing professional development programs, and increase the capacity of managers to manage HRH resources more efficiently.
2. **Increase the number, skill mix, and competency of the health workforce.** Ensure that educational institutions meet students' needs and use curriculum relevant to students' future patients. This objective also addresses management capability of pre-service institutions.
3. **Strengthen HRH/HSS leadership and governance capacity.** Promote transparency in HRH decisions, strengthen the regulatory environment, improve management capacity, reduce gender disparities, and improve multi-sectoral collaboration for advancing the HRH agenda.
4. **Increase sustainability of investment in HRH.** Increase the utilization of HRH data for accurate decision-making with the aim of increasing investment in educating, training, and managing a fit-for-purpose and fit-for-practice health workforce.



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