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Evaluation of PEPFAR's Contribution (2012–2017) to

RWANDA'S HUMAN RESOURCES FOR HEALTH PROGRAM

Study Sponsor

U.S. Centers for Disease Control and Prevention

Committee on the Evaluation of Strengthening HRH Capacity in the Republic of Rwanda under PEPFAR

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Abstract

A persistent shortage of health care workers in Rwanda is a key barrier to meeting the nation's health needs. Rwanda's Human Resources for Health (HRH) Program was conceived to strengthen health professional education and thereby increase the number of high-quality health professionals in the country. The HRH Program was funded by the Government of Rwanda; the Global Fund to Fight AIDS, Tuberculosis and Malaria; and the U.S. government's initiative to support the global response to HIV, known as the President's Emergency Plan for AIDS Relief (PEPFAR). In 2018, the U.S. Centers for Disease Control and Prevention and the State Department asked the National Academies to evaluate PEPFAR-supported HRH Program activities.

The HRH Program more than tripled the country's physician specialist workforce and produced major increases in the numbers and qualifications of nurses and midwives. Partnerships between U.S. institutions and the University of Rwanda introduced new programs, upgraded curricula, and improved the quality of teaching and training for health professionals. Growing the number, skills, and competencies of health workers contributed to direct and indirect improvements in the quality of HIV care, including greater availability of providers, improved skills for basic and HIV-specific care, and improved skills to address HIV-related complications.

Based on the successes and challenges of the HRH Program, the report recommends that future investments in health professional education be designed within a more comprehensive approach to human resources for health and institutional capacity building, which would strengthen the health system to meet both HIV-specific and more general health needs. The recommendations offer an aspirational framework to reimagine how partnerships are formed, how investments are made, and how the effects of those investments are documented.

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Background

Section Overview

- The HRH Challenge in Rwanda
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The HRH Challenge in Rwanda

The Republic of Rwanda, a PEPFAR* partner country since 2004, has made gains in its HIV response, including increased access to and coverage of antiretroviral therapy and decreased HIV prevalence. However, a persistent shortage in human resources for health (HRH) affects the health of people living with HIV (PLHIV) and the entire Rwandan population. This challenge is consistent with a balancing act commonly faced in the global response to HIV, which requires policy, funding, and programmatic decision making around how to improve health care to meet HIV-specific needs—the core of PEPFAR's mission—within a health system that lacks sufficient capacity to meet either HIV-specific health needs or those of the broader population.

Recognizing HRH capabilities as a foundational challenge for the health system and the response to HIV, the Government of Rwanda worked with PEPFAR and other partners to develop a program to strengthen institutional capacity in health professional education and thereby increase the production of high-quality health workers.

* PEPFAR is the President's Emergency Plan for AIDS Relief (PEPFAR) —the U.S. government's initiative to support the global response to HIV.

The HRH Program

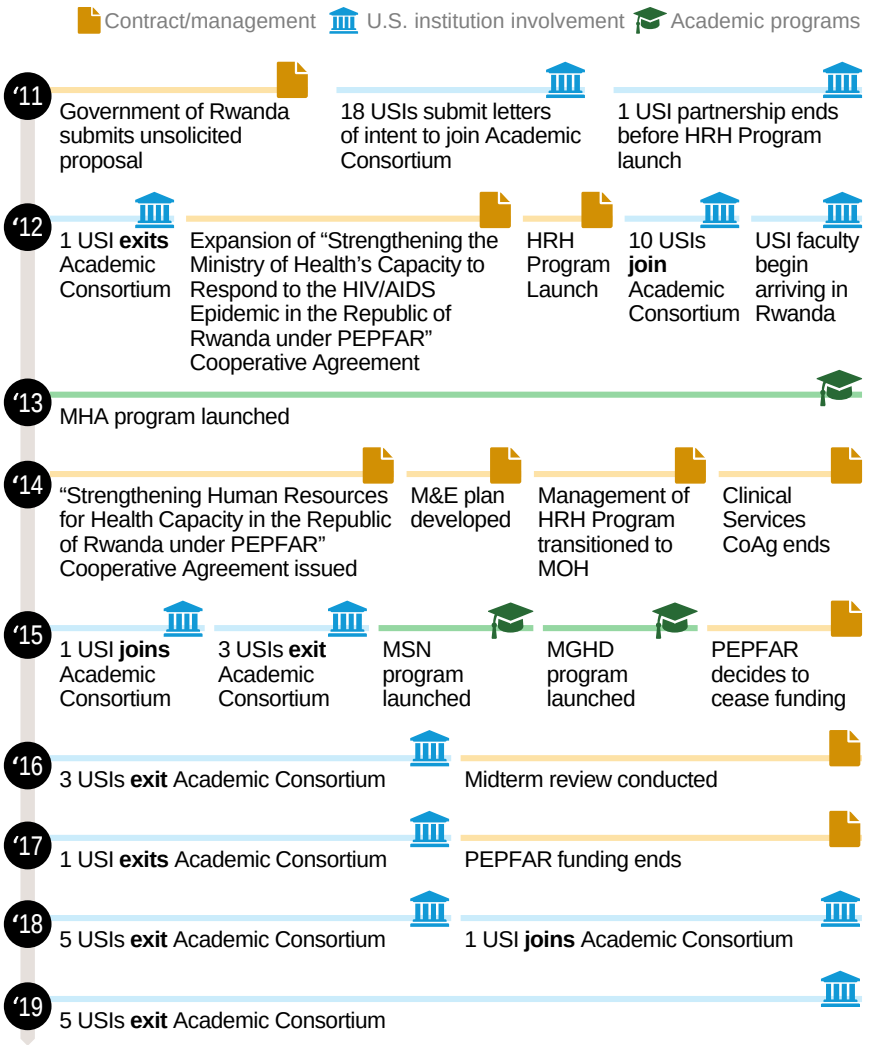
The HRH Program was originally designed to address four barriers to the provision of adequate care: a shortage of skilled health workers, poor quality of health worker education, inadequate infrastructure and equipment for health worker training, and inadequate management across different health facilities. The Ministry of Health, which implemented the Program, partnered with U.S. medical, nursing, dental, and public health training institutions to build capacity at the University of Rwanda College of Medicine and Health Sciences. Activities centered around a twinning program that paired Rwandan and U.S. faculty and health professionals, new specialty training programs and curricula, and investments in teaching hospitals and learning environments.

Funding came primarily from PEPFAR through the U.S. Centers for Disease Control and Prevention (CDC). Other funders included the Global Fund to Fight AIDS, Tuberculosis and Malaria and the Ministry of Health; and to a lesser extent, other entities. The HRH Program was fully managed by the Government of Rwanda and was designed to run from 2011 through 2019. PEPFAR initiated funding in 2012. In 2015, PEPFAR adopted a new strategy focused on high-burden geographic areas and key populations, resulting in a reconfiguration of its HIV portfolio in Rwanda and a decision to cease funding the Program, which was determined no longer core to its programming strategy. The last disbursement for the Program from PEPFAR was in 2017.

The HRH Program

In 2011, the Government of Rwanda submitted an unsolicited proposal that was funded in 2012 under the expanded Clinical Services Cooperative Agreement. Prior to funding, 18 U.S. institutions submitted letters of intent to join an Academic Consortium, with others joining and exiting through 2019. Membership in the Academic Consortium provided U.S. institutions with a mechanism through which to establish annual Memoranda of Understanding with the Ministry of Health.

The Consortium was also a mechanism for determining the clinical purview of each U.S. institution. For example, Yale University was an obstetrics and gynecology partner and New York University and Emory University provided support to the nursing programs.



The Charge

Through a single-source request for application, the CDC asked the Health and Medicine Division of the National Academies of Sciences, Engineering, and Medicine to evaluate the HRH Program. The overarching purpose of the request was to understand how PEPFAR's investment affected morbidity and mortality outcomes for people living with HIV.

FOUR EVALUATION OBJECTIVES

1. Describe PEPFAR investments in HRH in Rwanda over time, including its support for Ministry of Health efforts to address HRH needs as outcomes and on patient- or population-level HIV, as well as the broader context in which these investments were made
2. Describe PEPFAR-supported HRH activities in Rwanda in relation to programmatic priorities, outputs, and outcomes
3. Examine the impact of PEPFAR funding for the HRH Program on HRH outcomes
4. Provide recommendations to inform future HRH investments that support PLHIV and to advance PEPFAR's mission

02

Evaluation Approach

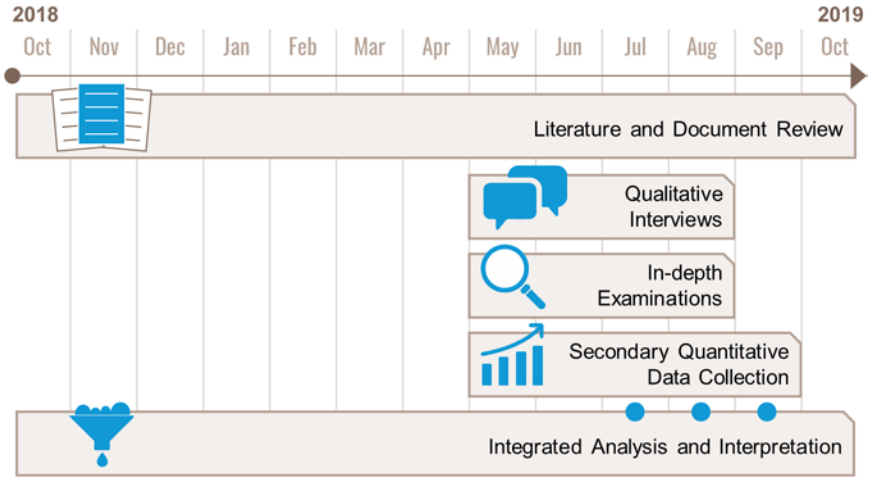
Section Overview

- Design
- Strengths and Limitations

Design

The evaluation applied a retrospective, concurrent, mixed methods design with embedded in-depth examinations and contribution analysis. The committee approach focused on the HRH Program's potential contributions to observed outcomes by understanding how the Program and its components were implemented and by examining the contextual factors that may have enhanced, moderated, or otherwise influenced outcomes.

Mixed methods designs provide the flexibility to capture trends regarding what results have occurred, while enabling a deeper understanding of how gains were achieved and why change has (or has not) happened. Such designs also provide insight into how different populations might have experienced the intervention. Drawing on multiple data sources and approaches, this evaluation yields an understanding of breadth (via quantitative data) and depth (via qualitative data). Using mixed methods and drawing on data from diverse data sources is of critical importance when evaluating complex interventions for which the pathway between activities and outcomes is nonlinear.



Design

The data sources had complementary uses for the evaluation.

The document review drew on policy and program documents, reports, and published literature. It situated the HRH Program within the broader HRH and HIV context in Rwanda and across the globe to understand the context and landscape in which the Program was designed and implemented and to inform an understanding of the extent to which it implemented activities and produced results as planned.

Knowledge of the HRH Program—its inception, implementation, management, and transition after the close of funds from PEPFAR—were used to further address the evaluation objectives. These data provided insight into the Program's implementation and achievements, and into its perceived effect on HRH capacity and HIV service delivery.

These data also facilitated the interpretation of findings from the document review and from secondary quantitative data for HRH and HIV outcome indicators, which were analyzed for trends over time.

Design

The two in-depth examinations were conducted at the University of Rwanda and a “facility microsystem,” a facility that receives referral patients from a lower-level facility. These deeper examinations provided a more holistic understanding of the effects of the HRH Program on the capacity to produce a workforce of sufficient quantity and quality to meet the needs of the Rwandan population, and of the HRH Program’s role in affecting health care management and the provision of HIV and other health services.

In an effort to assess the potential causal impact on HIV outcomes, the intention was to treat HRH Program graduates as an in tervention, characterizing each district’s dose based on quantity and type of graduate. The committee could then estimate the Program’s pooled effect on the HIV outcomes of interest. However, unavailability of data at the required level of detail hindered the committee’s ability to perform this type of analysis.

Strengths and Limitations

Strengths

- Mixed methods designs provide flexibility to capture trends regarding what results were achieved
- Design allowed for examination of complex and nonlinear pathways to outcomes
- Qualitative examination enabled deep understanding of how different populations experienced the intervention

Limitations

- The CDC did not participate in qualitative data collection as it was deemed a conflict of interest
- Not all specialties are represented equally in the qualitative data
- Not possible to design an evaluation that assessed attributable impact

03

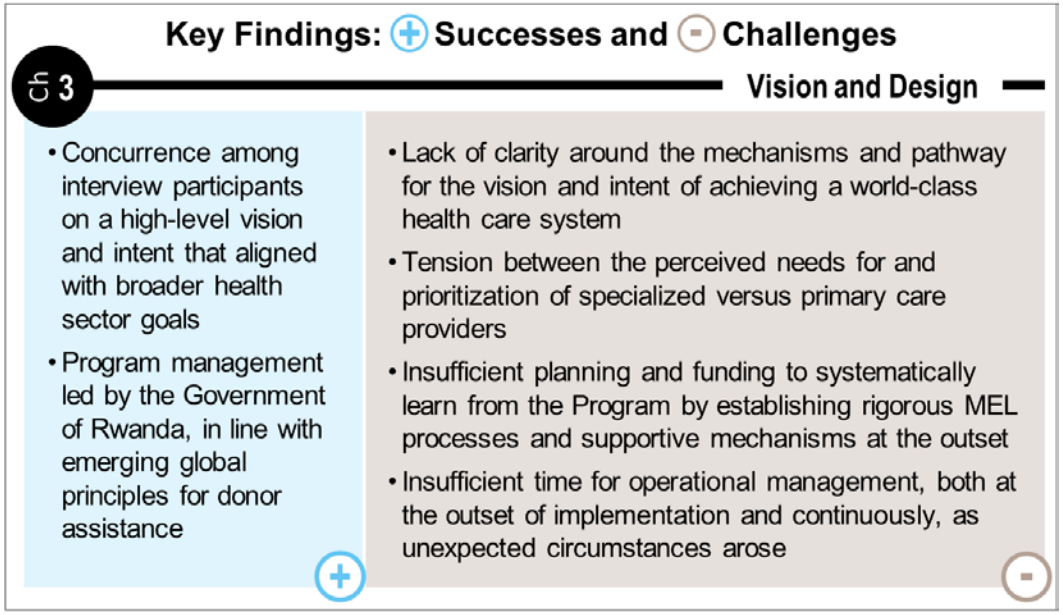
Findings and Conclusions

Section Overview

- Program Context, Vision, and Design
- Faculty Twinning
- Institutional Capacity for Health Professional Education
- Health Worker Production
- Effects on Quality of Care
- Overarching Conclusions

Program Context, Vision, and Design

The HRH Program budget proposed in 2011 was $151.8 million over 8 years. The Program received external funding from the U.S. government, through PEPFAR, and from the Global Fund. The total funding amount from these external sources, as provided by the Ministry of Health, was just under $100 million, with approximately 60 percent coming from the U.S. government.



Program Context, Vision, and Design

The HRH Program represented a confluence of unusual circumstances and an opportunity in foreign assistance.

The Program's design endorsed Rwanda's larger vision of strengthening the country's workforce, including in the health sector, although there were missed opportunities to learn systematically. There was concurrence among HRH Program participants on a high-level vision and intent, which aligned with broader health-sector goals. However, there was a lack of clarity around the mechanisms and pathway for achieving a world-class health care system, the consequences of which were felt during the implementation of the Program.

Although the Government of Rwanda recognized the unprecedented scale and nature of the HRH Program's strategies, there was insufficient planning to exploit the opportunity to learn systematically from this endeavor by establishing rigorous monitoring and evaluation processes and supportive mechanisms at the outset. Overall management of the HRH Program was challenged by the lack of time for operational management, both at the outset of implementation and continuously, as unexpected circumstances arose. More time between the design, launch, and execution phases would have supported stakeholders' ability to better anticipate and develop contingent strategies for issues such as PEPFAR funding processes and restrictions.

Program Context, Vision, and Design

The Program's plausible contribution to HRH and HIV-related outcomes was conceptualized through a theoretical causal pathway for how programmatic activities and resulting changes in HRH outputs could reasonably be expected to contribute to intermediate HRH and health outcomes for PLHIV.

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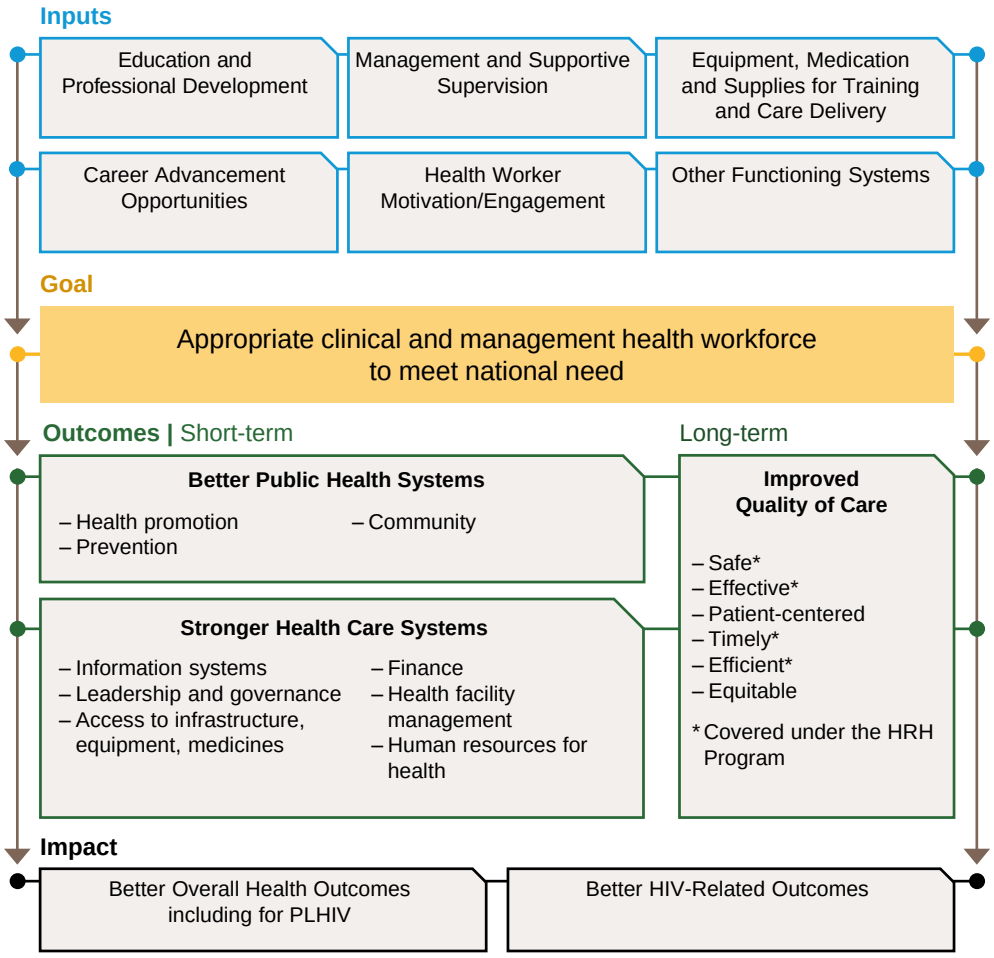
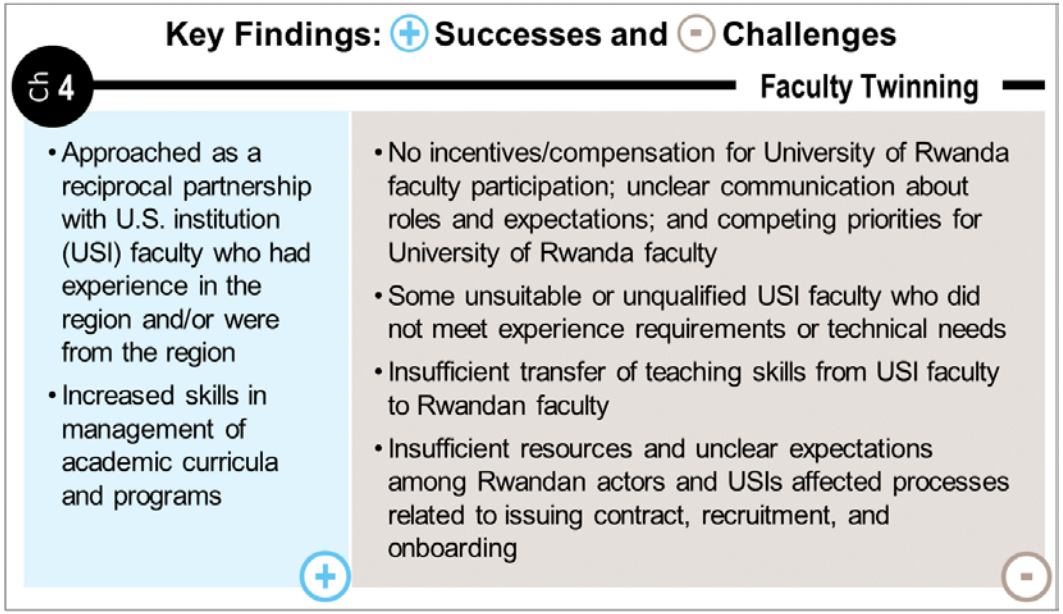


Faculty Twinning

U.S. institutions contracted with individuals to work at the University of Rwanda to "twin" with and mentor existing Rwandan faculty, aid in strengthening existing residency programs and establish new programs, provide direct teaching services to Rwandan students, and, in some cases, provide direct care to patients. With few exceptions, the U.S institutions contracted with U.S. citizens and did not engage regional faculty who could lend practical experience and knowledge from a more locally relevant context to the Program.



Faculty Twinning

The HRH Program twinned USI faculty and University of Rwanda faculty at an individual level, and experienced mixed results in twinning, mostly owing to varied experiences in design, management, and implementation across specialties. Strengths of the model include bringing external faculty and other experts via the memoranda of understanding with U.S. institutions, and gains in University of Rwanda staff members' capacity to manage and plan for new specialty programs and the increased number of students and residents who were flowing through the university and teaching hospitals.

However, there was variation across programs, with Rwandan faculty in the MSN program, for example, demonstrating notably increased capacity. The reciprocal nature of twinning relationships was evident in some pairings, though not all, and was found to be more successful where interpersonal relationships had developed between twins. The formation of continued partnerships resulted in new publications and advancement in University of Rwanda faculty's professional development. However, respondents reported a perceived lack of equality, which is key to reciprocal relationships, between U.S. institution faculty and Rwandan faculty's compensation.

Nonetheless, twinning did not meet its original objective of widespread teaching and clinical skills transfer between U.S. institution and University of Rwanda faculty, in part because the original design lacked clarity on how to operationalize this unique model, which worked across 22 programs. On both sides of the relationship, lack of resources and time committed to setting up and then managing the initiative created challenges in issuing contracts, recruitment, and onboarding. Further, lack of incentives to encourage University of Rwanda faculty to participate, given their other responsibilities—combined with challenges caused by cultural differences between the twins—impaired the model's sustained success. The result was the absence of a dynamic twinning process that allowed for tactical adjustments.

Institutional Capacity for Health Professional Education

An educational institution's capacity to provide ongoing, high-quality health professional education requires adequate administrative infrastructure and institutional support to recruit and sustain dedicated faculty, enable them to improve their teaching skills and update curricula as the evidence base changes, and provide them with the necessary teaching equipment and materials.

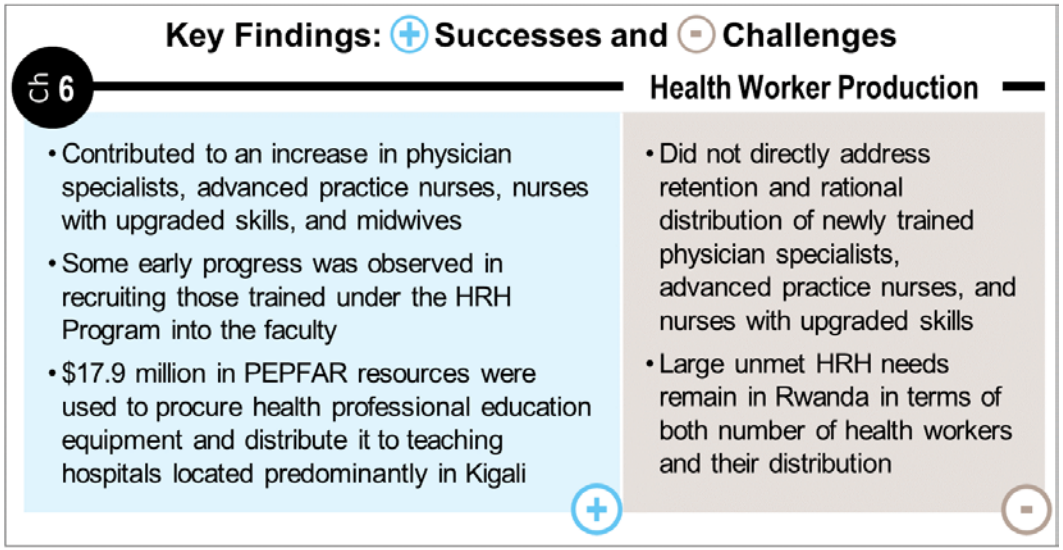
Institutional Capacity for Health Professional Education

At the outset of the HRH Program, there was an underestimation of the degree of structural change within the University of Rwanda, and across sectors, that was needed for institutionalized capacity for health professional education and that would occur as a consequence of the HRH Program. The perception of its success was first in training health workers, second in augmenting service delivery, and third in building the University of Rwanda faculty capacity in teaching. The institutional reform of greater joint planning among ministries was an unplanned outcome, while expanding linkages with regional and global networks was not observed. Literature on the HRH Program since 2015 has documented processes and outputs primarily in the following domains: trainees' perceptions of HRH Program curricula or activities; measurements of knowledge acquisition or teaching and clinical skills transfer among HRH trainees; factors affecting recruitment of trainees and faculty; and general gaps and improvements to the HRH Program curricula.

Development of University of Rwanda faculty capacity occurred through a number of activities, including mentoring and twinning. Bringing in external faculty and other experts via the memoranda of understanding with U.S. institutions added value to the quality of health professional education and training, as determined by the development of new programs and curricula or the updating of existing curricula, increased research output, and the provision of high-quality teaching by U.S. institution faculty. Exposure to the twinning model, U.S. institution faculty, and teaching quality also had a positive effect on Rwandan faculty and students, providing a mechanism for those trained to take on leadership roles in providing quality of care and to train the next generation of health professionals in Rwanda.

Health Worker Production

Between 2009 and 2015, the number of health workers in Rwanda remained relatively consistent, at 7.8–8.9 per 10,000 people. When disaggregated by cadre, most were nurses, with significantly fewer doctors and midwives. By 2018, Rwanda had 1 physician and 7 nurses and midwives per 10,000—still far below the WHO's 2016 recommended critical minimum threshold of 44.5 doctors, nurses, and midwives per 10,000 people. This shortfall represents a production challenge: an insufficient number of trained health professionals relative to the need.



Health Worker Production

Although more medical students graduated from undergraduate and postgraduate training programs after the HRH Program started, there was variability by specialty. The higher numbers of graduates in 2016, 2017, and 2018 reflect the increase in enrollment rates in the first 3 years of the Program. A maximum likelihood time series analysis was performed to assess the statistical significance of this increase.

Results indicated that the total number of physician specialists graduating per year from 2014 through 2018 increased significantly ($P < 0.001$), compared to the 2007–2013 period. Data provided by the Ministry of Health indicated most medical specialists were distributed with high numbers at Rwanda Military Hospital, CHUK (University Teaching Hospital, Kigali), CHUB (University Teaching Hospital,

Butare)—and with smaller disbursements, in comparison, in Ruhengeri and Muhima hospitals—most of whom were internists, pediatricians, obstetricians and gynecologists, and/or surgeons. The effect of reduced investments in the HRH Program on graduation rates requires more time to assess.

Health Worker Production

University of Rwanda Medical Student Graduation Numbers by Program

Department	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bachelor of Medicine and Surgery	117	42	88	130	75	96	72	83	103
Postgraduate									
Anesthesiology	2	2	1	2	3	2	5	—	—
Internal Medicine	3	3	6	1	6	10	14	12	17
Pediatrics	5	5	8	—	1	6	14	13	11
Obstetrics/Gynecology	6	—	7	—	5	6	14	10	13
Ear, Nose, and Throat	—	—	—	—	2	3	3	1	—
Family and Community Medicine	—	—	—	—	2	—	—	—	—
Surgery	4	—	4	—	4	5	9	5	4
Neurosurgery	—	—	—	—	—	—	—	1	1
Orthopedics	—	—	—	—	—	—	—	—	1
Urology	—	—	—	—	—	—	—	1	—
Anatomical Pathology	—	—	—	—	—	—	—	4	4
Psychiatry	—	—	—	—	—	—	—	3	2
Emergency and Critical Care	—	—	—	—	—	—	—	—	6

Health Worker Production

Interview respondents across all stakeholder types agreed that more physician specialists were trained and more nurses with advanced skills were produced under the HRH Program. One Ministry of Health representative who received her medical training before the Program began expressed appreciation for the improved skills HRH trainees gained under the program.

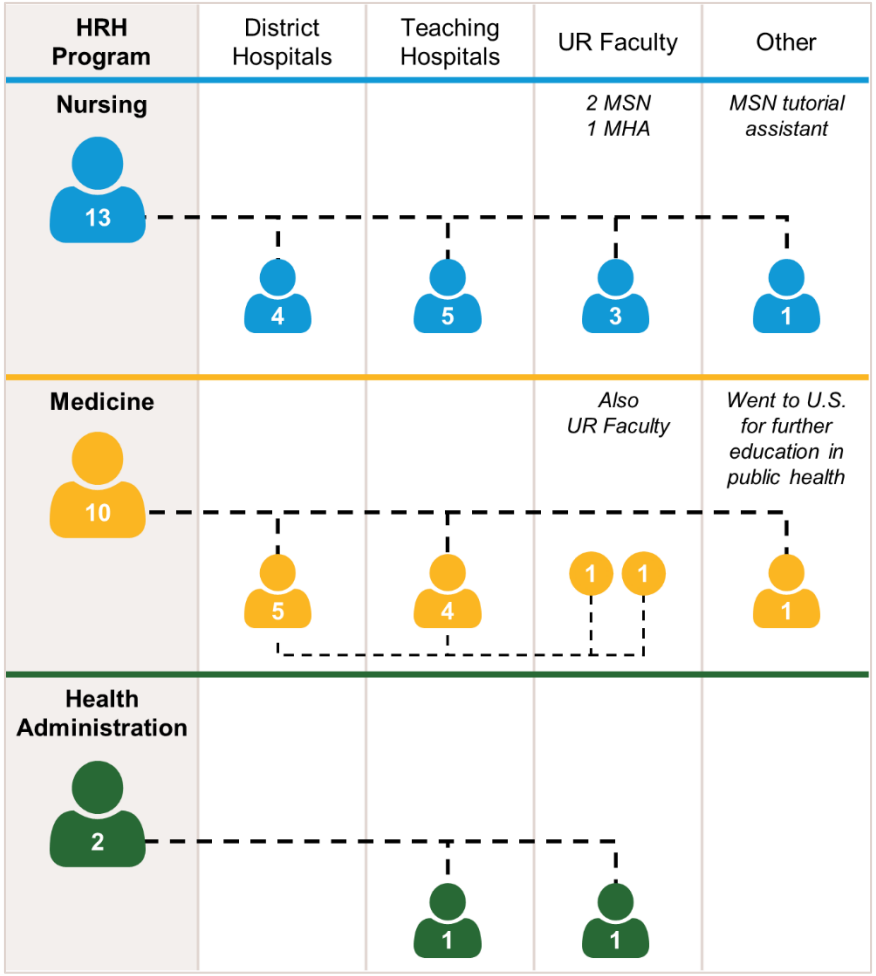
> The HRH Program was amazing—helped cover the gaps in-country, including specializations such as pediatrics and internal medicine. There is a difference in the quality of training and doctors from before the HRH Program. … We had high level, skilled teachers from top tier U.S. institutions. When I was training, we didn't learn how to treat HIV or co-infections, so that is a big difference the HRH Program has made. We don't have to retrain the graduates coming out now; they are integrated into the system, and their education is providing them the required skills. They are very well equipped.
>
> *(87, Government of Rwanda HRH Program Administrator)*

Health Worker Production

Evidence from qualitative data collection supports the claim that the HRH Program produced more health care workers and academics with specialized skills who are feeding back into the health system.

For example, of 25 HRH trainees interviewed for this evaluation, 9 went on to work in district hospitals, 9 went to work in teaching hospitals, 4 became University of Rwanda faculty, 1 continued studies in Rwanda, and only 1 left to pursue other studies in the United States.

Career trajectory of interviewed HRH Program graduates following graduation

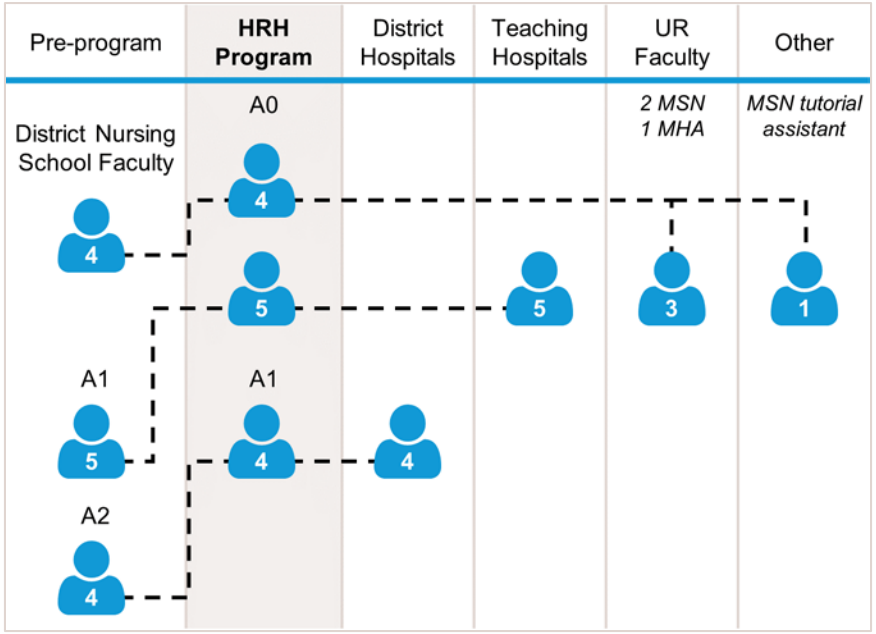


Health Worker Production

There is clear evidence of upgrading of nurses in the interview respondent sample.

Before the HRH Program, four were working as faculty in district nursing schools, four were working as A1 nurses, and four were working as A2 nurses. All 13 nurses improved their skills by one level through their courses under the HRH Program and have returned to or continued working in the health system, with four working in district hospitals, five working in teaching hospitals, three serving as faculty at the University of Rwanda, and one working as an MSN tutorial assistant while she finishes her degree.

Career trajectory of interviewed HRH Program trained nursing respondents



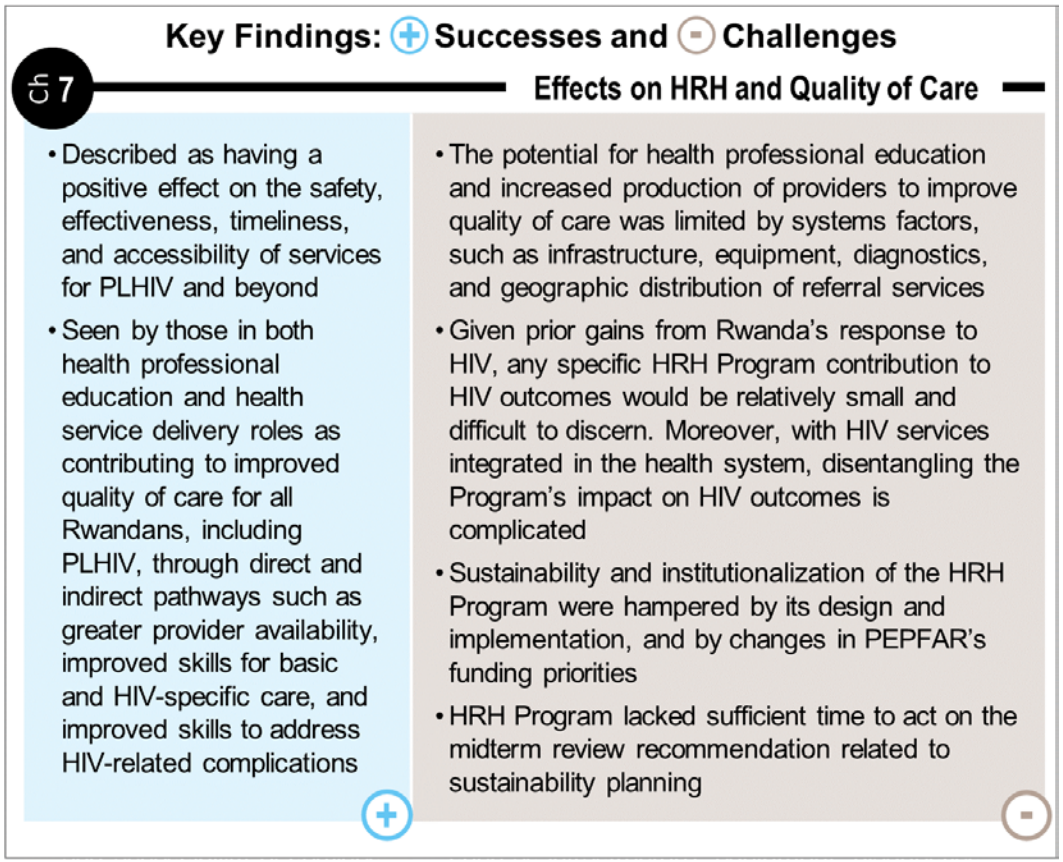
Health Worker Production

Enhancing education-related infrastructure and equipment in health facilities and educational sites was a critical challenge to address within the HRH Program to facilitate improved health professional education and its sustainability. With a total budget of $151.8 million for the 8-year project period, $29.8 million was projected for infrastructure and equipment upgrades under the line item “Rwandan Schools.” Of that projected budget, $1.5 million was allocated for equipment maintenance. The 2014 monitoring and evaluation (M&E) plan cited two key output indicators for semiannual monitoring: (1) number of newly procured equipment and installed at site level, and (2) number of staff trained on equipment maintenance

According to Ministry of Health records, PEPFAR-supported HRH Program expenditures totaled $59.1 million, including $17.9 million on health professional education-related equipment procurement, almost $2 million more than the $16.1 million budgeted for equipment. Equipment procured with PEPFAR funds included a range of items: teaching and reference books, thermometers and stethoscopes, teaching simulators, and larger equipment for clinical services, such as echocardiograph machines and portable blood testing machines. Equipment primarily went to facilities in 24 of Rwanda’s 30 districts, with the largest portion going to Nyarugenge District, specifically to CHUK, the country’s largest teaching hospital. Huye District and CHUB, another large teaching hospital and the previous site of Rwanda’s medical school, received the second largest amounts of equipment.

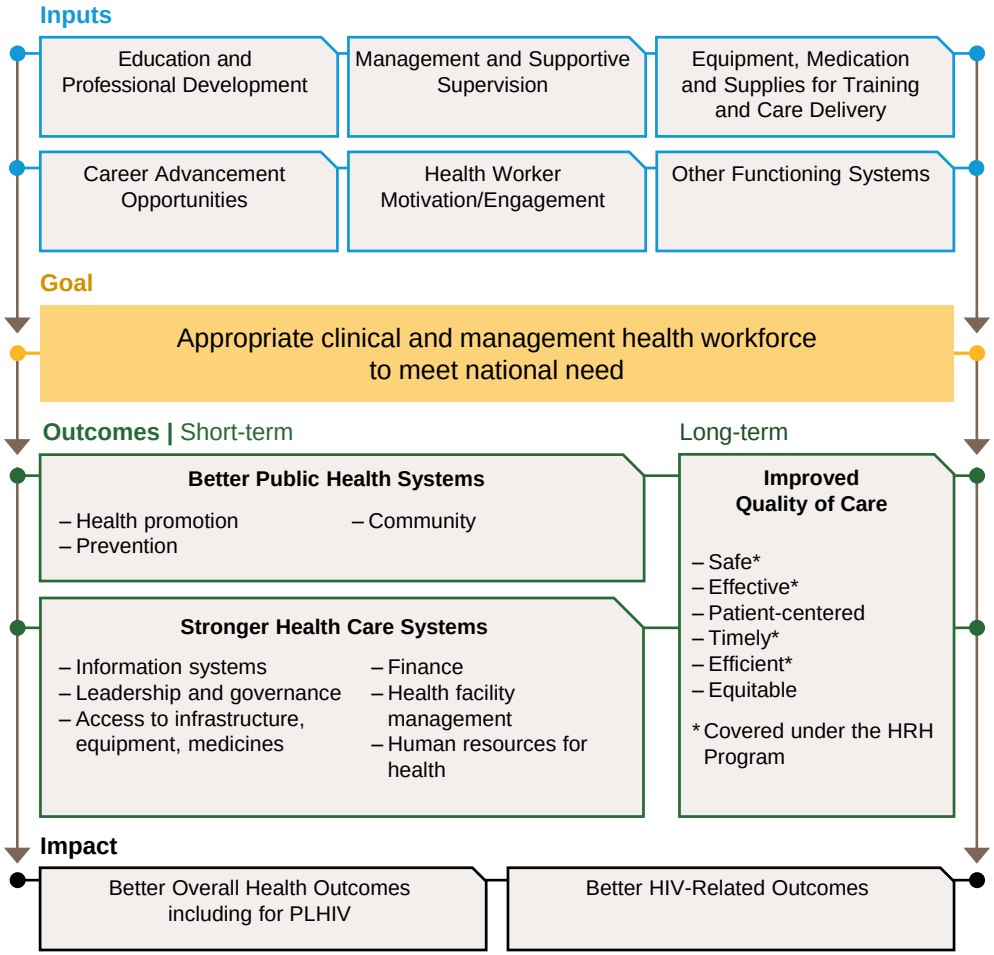
Effects on Quality of Care

Using the Institute of Medicine dimensions of quality as a frame, the HRH Program investment had a qualitative impact on the safety, effectiveness, timeliness, and accessibility of services for PLHIV and beyond. A small amount of qualitative data indicates that there may have been some contributions to improving equity in care and reducing stigmatization for PLHIV. The Program was seen by those in both health professional education and health service delivery roles as contributing to improving quality of care for all Rwandans, including PLHIV, through direct and indirect pathways (greater provider availability, basic skills, HIV care-specific skills, skills to address HIV-related complications).



Effects on Quality of Care

Through building awareness and use of evidence-based medicine and quality improvement methodologies, the safety and effectiveness of clinical interventions were seen as improving.



Effects on Quality of Care

The HRH Program was seen as building a cadre of physician specialists, thereby increasing access; however, the geographic distribution of some specialties was an ongoing barrier. The Program also was seen to have an effect on time management and patient flow, improving the timeliness of services. Although this view was not widespread, one U.S. institution faculty member noted that there had been improvements in treatment for and reduction in stigmatization of HIV-positive cervical cancer patients, which may point to small inroads in improving equity.

The causal pathway highlights the role of improved quality of care as a longer-term outcome that is required to effectively impact health outcomes for all and HIV-related outcomes. Investments in human resources and other health systems strengthening blocks need to evolve over time as the context and needs of the population change; however, ongoing investments are required to continue to improve the health outcomes of Rwandans.

The committee did not have sufficient data to provide a quantitative assessment of the HRH Program's impacts on health outcomes. That said, the design of the Program, in principle, would have allowed a quantitative assessment of changes in outcomes following implementation. The clear outset of the Program, its defined set of training activities, and the distribution of HRH trainees across Rwanda mean that a quantitative assessment of impact with reasonable potential for causal attribution could, in principle, be carried out as follows.

Effects on Quality of Care

The design would conceptualize Rwandan districts that received HRH trainees as independent units with their own trajectories of health outcomes such as HIV testing, treatment, and viral suppression rates. The new infusion of HRH trainees would then be tested as an "intervention" that is applied to each district at a unique "dose" that is represented by the quantity and type of HRH trainees who enter each district, ideally characterizing dose in relation to population or disease burden. Designs such as regression discontinuity, interrupted time series, or difference-in-difference could then use district-level fixed effects to estimate the pooled effect of the Program on the outcomes of interest.

The information needed for such an analysis would allow the creation of panel data of districts, with two central pieces of data: (1) repeat observations over time (e.g., monthly or quarterly) of the health outcomes of interest, before and after the implementation of the HRH Program; and (2) detailed information on the trajectory of HRH trainees to districts, including the timing, type of health professional, and any ancillary information about the types and intensity of clinical services provided by the trainee. These two data elements could provide minimal but sufficient foundation for a quantitative assessment of impact. Unfortunately, neither of these key data elements were available to the committee. The committee felt that future HRH efforts could fill key knowledge gaps around their potential for impact on a range of individual and population health outcomes by conceptualizing, a priori, a rigorous evaluation design that fits with the planned HRH intervention. Such evaluations should be designed with input from implementers and stakeholders, but executed by independent teams who are separate from those implementing the Program.

Effects on Quality of Care

Sustainability and institutionalization of the HRH Program were significantly hampered by the design and implementation, and PEPFAR's changes in funding priorities.

There was general agreement among respondents that prolonged engagement of U.S. institution faculty in an intensive twinning program was not the desired outcome, but there was also recognition that there had been insufficient time to institutionalize the ability to continually update curricula and teaching methodologies in the University of Rwanda.

The HRH Program's midterm review also pointed to the need for improved sustainability planning, but PEPFAR's decision to end funding before the planned end of the Program limited the Ministry of Health's ability to act on this recommendation.

Overarching Conclusions

The HRH Program had many successes with respect to its goal to expand the quantity and quality of the health workforce in Rwanda, with particular examples in the value it added to the quality of health professional education and training for different cadres of health professionals, especially in nursing, and improvements in the overall preparation and motivation of new professionals entering the workforce.

The Program was seen by those in health professional education and health service delivery as contributing to improving quality of care for all Rwandans, including PLHIV, through direct and indirect pathways.

Some of these successes resulted from the original design, whereas others were more unexpected, resulting from adaptations made in response to operational realities or challenges encountered.

There were mixed results with respect to the ambitious goals of the Program to increase institutional capacity for health professional education, resulting from a truncated time frame, operational challenges in its implementation, and insufficient design and planning around the intended mechanisms of change and the complexity of structural changes needed to achieve improvements in health professional education.

Overarching Conclusions

With respect to outcomes for PLHIV, it was more difficult to assess the Program's effects. There are indications that it contributed to improved quality of care, and the evaluation found no indications to suggest that the allocation of funds to this Program undermined Rwanda's continuing progress in the HIV response. However, the evaluation was constrained in being able to fully assess the Program's contribution to impact on PLHIV-specific health outcomes.

The HRH Program represented what was, at the time, a relatively uncommon (although not unique) donor-funded approach to strengthening HRH capacity in low- and middle-income countries by focusing on a large investment, at a foundational level, for capacity building in institutions for health professional education. For PEPFAR, it also represented a departure from the usual operational model between funder and government.

When seen in light of this committee's charge, the exceptional nature of the Program ended up being a missed opportunity to learn from what could have been a more intentionally designed approach that could have added new insights to the knowledge base not only for how to strengthen HRH capacity, but also, more broadly, for how to navigate the balancing act between disease-specific priorities and broader health system needs.

04

Recommendations

Section Overview

- Learning from This Evaluation Health Professional Education Design Framework
- Program Co-design
- Complex Systems Thinking
- Planning and Adaptive Management
- Models for Improving Health Professional Education
- Monitoring, Evaluation, and Learning

Learning from This Evaluation

These recommendations provide a framework for how future efforts could build on the lessons learned from the HRH Program, both reinforcing its successes and making accommodations to address its challenges, with a design that more fully accounts for needs and feasibility at baseline and ensures more of the needed information will be available to learn about the effects on the system and the effects on the response to HIV.

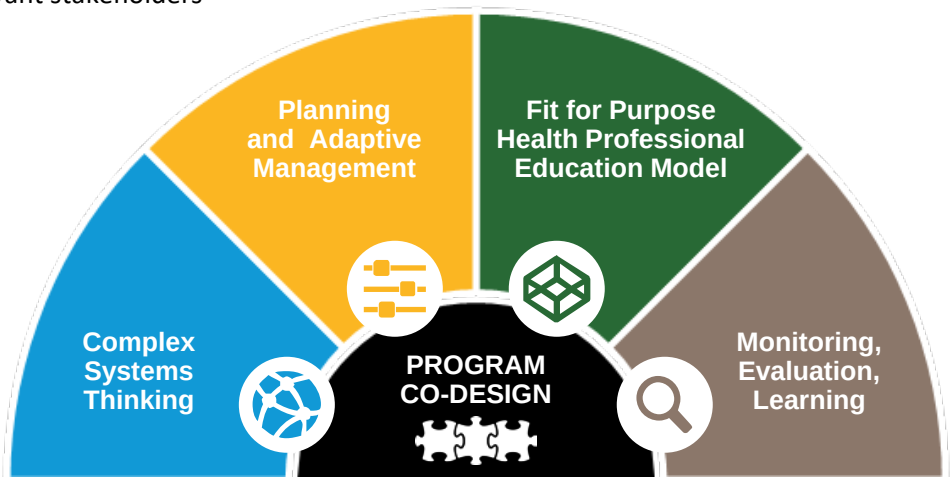
Although the primary audiences for this evaluation's findings and conclusions are PEPFAR and the government of Rwanda, the committee hopes the conclusions and recommendations will inform other funders and other institutions contributing to strengthening the health workforce, such as medical and health professional training institutions, professional societies, patient advocacy groups, and other civil society organizations.

The hope is that the lessons learned from this Program and the committee's recommendations might inform not only future effor ts in Rwanda, but also elsewhere in the region.

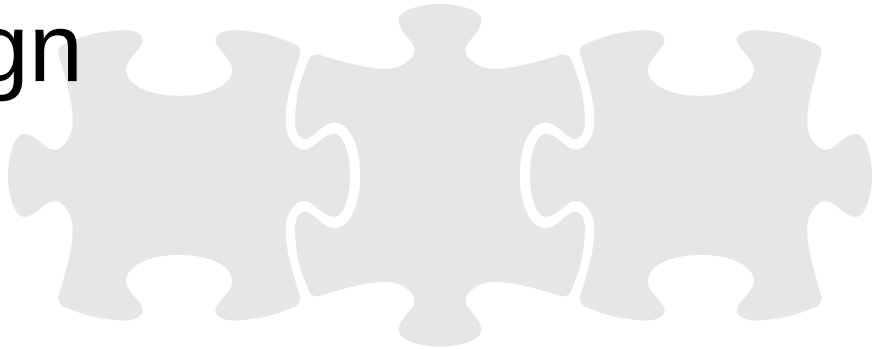
Learning from This Evaluation

The recommendations offer a framework for designing and implementing future efforts to strengthen the health work - force and the provision of services for PLHIV. Building on the successes from this Program, reflecting on the lessons learned, and recognizing the inherent complexity of HRH, the recommendations are organized around five key areas:

- The need to co-design programming with diverse relevant stakeholders
- The importance of taking a complex systems approach
- The value of planning and adaptive management
- The importance of selecting an appropriate model (or components) for improving health professional education
- The centrality of a proactive and multifaceted approach to monitoring, evaluation, and learning.



Program Co-design



To ensure a robust and feasible programmatic design, an effective approach is to employ a collaborative design process at the level of key decision makers representing funders and government leadership across relevant sectors, while including implementers and beneficiaries (in the case of health professional education: faculty, trainees, the public and private health systems that will employ program graduates, and ultimately, patients).

When embarking on a health systems strengthening program, it is important to engage all relevant government entities beyond the Ministry of Health, including the Ministries of Finance, Labor and Civil Service, and other government bodies, to ensure the national budget and policies support the programmatic objectives. This inclusive, multilayered design process can ensure that the effort responds to the need, reflects contextual realities, and has the potential to be executed effectively.

Complex Systems Thinking

The interactive, nonlinear, and often unpredictable relationship among parts of a health system warrants approaches to streng thening HRH that are designed around its inherent complexity. Applying complex systems thinking can change how program designers conceive of the challenges in the health system, the questions they ask about how to improve the system, and their understanding of the environment that either supports or hinders improvement. A systems approach to strengthening the health system should also recognize that the health system is nested within a larger government and the health workforce is nested within regional health labor markets. This necessitates multisectoral collaboration and coordination across the health, education, labor, and finance sectors and among governmental and nongovernmental institutions.

Because systems strengthening takes decades and the HRH pipeline spans multiple stages—from recruitment of students to preservice training through specialization and continuing professional development of the workforce, to longer-term issues such as health worker motivation and retention—designers of HRH programs should articulate and work toward comprehensive, long-term goals and outcomes. This will require local governments and funders to collaboratively develop funding strategies that outlast political terms and agendas and typical donor funding cycles, and enable a built-in transition to sustained country-led ownership and financing.

Planning and Adaptive Management

Because it relies upon complex systems change, strengthening HRH requires not only visionary leadership and effective program activities, but also an appropriate and sufficient management structure to shepherd a program through an inevitably multifaceted and complicated implementation process.

The experience of the HRH Program points to the need for strong management structures and processes that allow for continuous learning and improvement as a means of moving toward the defined programmatic goals, even in the face of policy pivots such as PEPFAR's shift from its 2.0 to 3.0 strategy, which resulted in a determination to cease funding.

Models for Improving Health Professional Education

Selection of a health professional education model should be based on the goals and vision of the program and the needs of the health workforce. There should also be a focus on future institutionalization.

When twinning models are used as part of efforts to improve health professional education, this evaluation offers several lessons for potential improvements to the process and effectiveness, depending on the time frame, the goals, and the desired type of skills transfer. Under the HRH Program, the objective was to transfer teaching and clinical skills to University of Rwanda faculty.

Monitoring, Evaluation, and Learning

For future investments in HRH, a low-cost but rigorous monitoring, evaluation, and learning plan and system will be most effective if it is included in the design phase and includes ongoing mixed methods monitoring, with pause points for learning throughout the program and the resources and staff to achieve realistic and actionable learning. Monitoring and evaluation capacity among in-country program managers and implementers should be strengthened to support ongoing monitoring and data use for decision making.

The advantages and disadvantages of also using an external third party for evaluation should be weighed and considered as part of the design. In addition to planning for learning about implementation processes and program outcomes, it would be valuable for future efforts to prospectively plan for analysis that would allow program designers, implementers, and others looking to learn from such programs to understand the costs of program implementation and select, plan for, and carry out assessments of return on investment.

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