Evaluation Report:
Strengthening Local Capacity to Deliver Sustainable Quality Assured Universal Coverage of Clinical TB/HIV Services in Manzini Region, and Provide Central Level Technical Assistance to the National Tuberculosis Control Program (NTCP) in the Kingdom of Eswatini under the President's Emergency Plan for AIDS Relief (PEPFAR)

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Acronym List

AHF	AIDS Healthcare Foundation
ANC	Antenatal care
APR	Annual progress report
ART	Antiretroviral therapy
BMU	TB Basic Management Unit
CDC	U.S. Centers for Disease Control and Prevention
CMIS	Client Management Information System
CoAg	Cooperative agreement
CQI	Continuous quality improvement
DS-TB	Drug-sensitive TB
DR-TB	Drug-resistant TB
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
EHLS/SHLS	Eswatini Health Laboratory Services
eNSF	Extended National Strategic Framework for HIV and AIDS
EMR	Electronic medical record
ENAP/SNAP	Eswatini National AIDS Program
EPMP	Evaluation and Performance Measurement Plan
ESoP	Evaluation Standards of Practice
FY	Fiscal year
GF	Global Fund for HIV, TB and Malaria
HCWs	Health care workers
HEI	HIV-exposed infants
HIV	Human immunodeficiency virus
HR	Human resources
HTS	HIV testing services
ICAP	ICAP at Columbia University Mailman School of Public Health
ICF	Intensified case finding
IMAI	Integrated management of adult illnesses
IPC	Infection prevention and control
IPT	Isoniazid preventive therapy
IP	Implementing partner
IRB	Institutional Review Board
KI	Key informant
KII	Key informant interview
LAM	Lipoarabinomannan
LEEP	Loop electrosurgical excision procedure
LLAPLa	Lifelong ART for pregnant and lactating women
M&E	Monitoring and evaluation
MDR-TB	Multi-drug-resistant TB
MER	Monitoring, Evaluation, and Reporting
MNCH	Maternal, neonatal and child health
MOH	Ministry of Health
NaHSAR	National Health Semi-Annual Review
NARTIS	Nurse-led ART initiation in Swaziland
NCC	National TB/HIV Coordination Committee

NGO	Non-governmental organization
NHRRB	National Health Research Review Board
NTBH	National TB Hospital, Eswatini
NTCP	National Tuberculosis Control Program
OPD	Outpatient department
PEPFAR	President's Emergency Plan for AIDS Relief
PHU	Public health unit
PIHTC	Provider-initiated HIV testing and counseling
PLHIV	People living with HIV
PMTCT	Prevention of mother-to-child transmission of HIV
QA	Quality assurance
QI	Quality improvement
QIC	Quality improvement collaborative
QM	Quality management
ReHSAR	Regional Health Semi-Annual Review
RFM	Raleigh Fitkin Memorial Hospital
RHMT	Regional Health Management Team
SHIMS	Swaziland HIV Incidence Measurement Survey
SIMS	Site improvement through monitoring systems
SOPs	Standard operating procedures
SRH	Sexual and reproductive health
SRHU	Sexual and Reproductive Health Unit of the Eswatini Ministry of Health
SI	Strategic information
SID	Strategic information department
TA	Technical assistance
TB	Tuberculosis
TB/HIV	TB-HIV co-infection
TB NSP	TB National Strategic Plan
TPT	TB preventive treatment
TWG	Technical Working Group
VCT	Voluntary counseling and testing for HIV
VIA	Visual inspection of cervix with acetic acid
VL	HIV viral load
WHO	World Health Organization

Executive Summary

Background

In 2015, ICAP at Columbia University received a five-year regional cooperative agreement (CoAg): *Strengthening Local Capacity to Deliver Sustainable Quality-Assured Universal Coverage of Clinical TB/HIV Services in Manzini Region, and Provide Central Level Technical Assistance (TA) to the National Tuberculosis Control Program in the Kingdom of Eswatini Under the President's Emergency Plan for AIDS Relief (PEPFAR)*. The aims of this program were (1) To provide national-level technical assistance to the National TB Control Program (NTCP) for TB/HIV activities; (2) To support capacity building of the Manzini Regional Health Management Team (RHMT) in order to strengthen their stewardship, ownership, and quality management of TB/HIV service delivery; and (3) To provide support to improve the coverage and quality of HIV and TB services in line with World Health Organization (WHO) guidelines, at public, mission, industrial, and private health care facilities and in community settings in Manzini. A combined mid- and end-term evaluation, including process and outcome evaluation components, was conducted during the fourth year of the program to provide an assessment of program implementation and achievements.

Methods

Evaluation indicators were developed based on the program logic model (Appendix A) and organized into the evaluation framework (Appendix B). Three primary approaches to data collection and analysis were used. (1) Program administrative records and data were reviewed and summarized to determine the completion status of program activities and to assess selected outcomes. (2) Key informant interviews were conducted with 20 individuals who had first-person knowledge of program activities, including representatives of the Ministry of Health (MOH), health facilities, and other organizations, to gain qualitative insights into the program and to identify key successes and challenges. Qualitative analysis used a framework approach to code transcripts and summarize findings in relation to the evaluation questions. (3) A survey of 254 health care workers (HCWs) was conducted at selected health facilities in Manzini to assess knowledge and self-efficacy on topics related to HIV and TB service provision. Survey sampling weights were applied prior to descriptive quantitative analyses. Findings were triangulated across multiple data sources. Stakeholders were engaged throughout the evaluation process, including in the development of the evaluation protocol, as key informants in interviews, and during the report writing process.

Findings and recommendations

Objective 1: Enhance TB service delivery through national level TA and capacity building support to MOH and the NTCP for all TB and multi-drug resistant TB (MDR-TB) related activities, including TB/HIV collaborative activities in TB settings.

ICAP's support resulted in the successful development and updating of three sets of national guidelines, including the drug-sensitive TB (DS-TB) and drug-resistant TB (DR-TB) guidelines, as well as three HCW training curricula and related SOPs and job aids. This work received positive feedback from stakeholders and was seen as a strength of the program.

However, the evaluation target for the competency of practicing nurses in Eswatini in TB and multi-drug resistant TB (MDR-TB) services has not yet been achieved. Thirty-seven percent of surveyed nurses in Manzini achieved competency, which is well below the benchmark of 80% and indicates that training of HCWs, particularly nurses, on the new guidelines should be strengthened.

Capacity-building of the NTCP, and particularly the support of the HIV/TB and monitoring and evaluation (M&E) Technical Advisor positions, were described as beneficial to national TB and HIV collaboration and

data quality, respectively. In the area of M&E activities, the integration of the TB module and indicators into the Client Information Management System (CMIS), the national electronic medical record (EMR), was identified as an area where additional work is needed. Additionally, early communication challenges with the NTCP limited collaboration between ICAP and the NTCP on some research activities, such as the TB Drug Resistance Survey. The percentage of facilities meeting TB/HIV performance standards was not able to be determined, since the standards were developed recently by another IP and have not yet been used to assess facilities.

Quality improvement (QI) activities to inform TB and MDR-TB services have been supported by ICAP throughout the program period, though only one report has been produced to date. MOH stakeholders commented positively on the innovative approaches to monitor and address TB mortality that are resulting from this work.

Recommendations:

- Continue to focus on integration of TB modules and indicators into CMIS, including the transition from TPT registers into electronic format. Until TPT registers are fully electronic, support improvements in data collection and monitoring for the existing TPT paper register system.
- Once facilities have been assessed on the new TB/HIV performance standards, provide targeted mentorship to under-performing facilities to support the development of action plans to address performance gaps.
- Moving forward, establish three-way engagement between ICAP, CDC and the NTCP. Clearly define roles and responsibilities and schedule regular communication among the three institutions.
- Continue ongoing QI work to address TB mortality rates. Ensure that reports summarizing lessons learned from all QI projects are written and disseminated to relevant stakeholders.
- Though Objective 1 focuses on national-level activities, the HCW survey was conducted in Manzini. See Objective 3 (p. 10-11) for recommendations to address the low rates of HCW competency in TB and MDR-TB services in Manzini.

Objective 2: Strengthen the Manzini RHMT's stewardship, ownership, and quality management of HIV/TB service delivery.

The baseline assessment of the RHMT was not conducted as planned, due to budget considerations and delays in the development of national policy documents on which the assessment was to be based. The lack of baseline data made assessment of progress challenging. However, ICAP did successfully develop and implement annual capacity-building plans for the RHMT. Changes in RHMT effectiveness in stewardship and leadership could not be assessed, since the metric to do so was never developed. Qualitatively, some key informants described ICAP's efforts as contributing to noticeable improvement in the Manzini RHMT's capacity to lead the implementation of quality care in the region.

Notably, all 43 ICAP-supported facilities now participate in ReHSAR meetings, which were described as important contributors in regional health care quality improvement. The number of facilities participating in QI projects has varied over time depending on the currently active project(s). ICAP's TA and logistical support for ReHSAR meetings was appreciated, though a few KIs suggested that an increased focus on TB in that forum would be helpful. All ICAP-supported facilities also conduct routine TB/HIV performance review, with the support of ICAP and the RHMT. ICAP's support of regional M&E systems was noted, though some KIs commented that capacitation of clinical staff to independently review and use their own data for monitoring and performance assessment would be helpful.

Recommendations:

- Implement systematic assessment of the RHMT using ICAP's district-level RHMT performance indicators: (1) Percent of planned RHMT meetings that were conducted, (2) Percent of RHMT meetings in which HIV service delivery data or other HIV-related data were discussed (3) Percent of RHMT meetings in which HIV quality improvement issues were discussed. Consider identification of additional specific benchmarks or indicators of RHMT leadership and performance that can be monitored and tracked over time.
- Establish contingency plans for critical program activities, so that even if funding or other resources are unavailable, a modified or reduced version of the planned activity can be undertaken rather than delaying indefinitely. Timeframes should be defined for each critical activity, such that delays beyond a certain date trigger activation of the contingency plan.
- Implement a routine review of ReHSAR indicators at regular intervals (for example, every other year), which will ensure that indicators are regularly assessed and updated as needed to align with current priorities. The next update may include strengthening the focus on TB-related indicators.
- Train and mentor health facility staff to routinely and independently (without ICAP/RHMT support) extract, collate, analyze and use their own TB/HIV data to review performance and develop QI plans as required.

Objective 3: Improve coverage and quality of provider-initiated HIV testing and counseling (PIHTC), prevention of mother-to-child transmission of HIV (PMTCT), TB, TB/HIV, pediatric antiretroviral therapy (ART), adult ART, and pre-ART HIV care, in line with 2013 WHO guidelines, at public, mission, industrial, and private health care facilities and in community settings in Manzini.

Recommendations related to multiple sub-objectives:

- Given low rates of HCW competency in DS-TB, DR-TB, PMTCT, and ART services, particularly pediatric ART, mentoring for facilities should be strengthened in these areas. This may involve additional mentoring visits, and/or visits with a designated focus on the relevant knowledge and skills.
- If funding allows, support additional training for HCWs, especially nurses and nursing assistants, in the provision of DS-TB and DR-TB, PMTCT, and pediatric ART services.

HIV testing services (HTS): The program has surpassed its annual targets for the number of individuals tested for HIV each year from FY16-FY19. Over FY18 and FY19, ICAP tested 182% of the combined annual testing targets (these years are being assessed together, in accordance with PEPFAR guidance). In FY19, MOH priorities shifted from maximizing testing numbers to maximizing efficiency in case finding. Despite program efforts to conduct more targeted testing in alignment with these new priorities, the percent yield of positive test results actually declined from FY18 to FY19. However, it should be noted that the number of individuals testing positive has still exceeded the annual target, indicating that even though ICAP may be over-testing, they are still identifying more than the target number of people testing positive. Still, this indicates that optimization of the HTS process could be improved. Testing coverage could not be assessed across all facilities at this time, since tracking of the number of testing-eligible clients is in the process of being implemented at facilities in early FY20.

KII respondents spoke positively of the program's support for PIHTC services and HTS, and noted a perceived positive impact of ICAP-supported HTS counselors and expert clients on testing coverage at the facility level. Eighty-four percent of surveyed HCWs were competent in HTS, and HCW self-efficacy to provide HTS was relatively high.

Index case testing was identified as a key challenge requiring improvement: Less than a third of identified contact persons received testing in FY19, well below the target of 80%. Additionally, the proportion of all positive HIV tests resulting from index case testing (6%) failed to reach the FY19 target (36%). Key informants also identified index testing as a remaining gap requiring additional efforts.

Recommendations:

- Ensure that eligibility screening and risk assessment is conducted correctly together with collection of consistent data on the number of testing-eligible clients at all facilities as planned. Once tracking is in place, use data to target support to any facilities lagging in testing coverage.
- Consider strengthening the quality of HTS yield measures by collecting data on re-testing status, which will allow for the exclusion of re-testers in yield calculations.
- Investigate the current strategies in place for HTS yield optimization; this could include an evaluation of the targeted testing strategy/tools in use. Strengthening of current approaches, and/or the development of new strategies, may be needed.
- This includes a continued focus on index case testing. A rapid assessment of the reasons for low testing rates of identified contacts may be useful – for example, is sufficient contact information being elicited from the index case to successfully reach identified contacts? Is there a lack of staff to carry out the testing of contacts? Have staff received adequate training on index elicitation and outreach?

Antiretroviral therapy (ART): As Eswatini works towards achieving 95% HIV treatment coverage of all people living with HIV (PLHIV), and Manzini region achieved 96% ART coverage as of December 2019, ICAP's contributions towards ART coverage and the rollout of updated treatment guidelines were identified as key strengths of the program. The percentage of patients testing positive who initiate ART has been measured at greater than 95% each year since FY15, though the proxy measure used provides an overestimate of this outcome. The proportion of facilities that initiate and retain 90% of eligible clients on ART need improvement, especially for pediatric populations. KIs also noted remaining gaps among sub-populations with lower coverage rates, particularly men, infants/children and adolescents, though these patterns did not emerge clearly in program data. Health care worker survey results indicate that HCW knowledge on ART for pediatric patients is limited, with just over half of HCWs achieving scores reflecting competency in pediatric ART services.

Recommendation:

- Identify specific ICAP-supported facilities that do not initiate ART for at least 90% of eligible adults, adolescents and children, and/or do not have ART retention rates of at least 90% for each of these groups, and provide targeted TA, HR support and mentoring as needed to increase ART coverage.

Viral load (VL) monitoring and viral suppression: ICAP's key contributions to the implementation of routine VL monitoring were acknowledged by KIs at the national, regional and facility levels. VL testing coverage has been a challenge for the program, and though coverage has steadily improved to 76% in FY19, there remains room for improvement. Several KIs noted this and emphasized that continued efforts are needed to maintain momentum.

The rate of overall viral suppression at ICAP-supported sites reached 97% in FY19, surpassing the goal of 95% of ART patients suppressed. However, viral suppression rates remain lower among children and adolescents, reflecting a similar pattern in national outcomes.

Recommendation:

- Continue work to address ART coverage (see also the recommendation on ART, above) and VL monitoring for sub-populations (particularly children). This may include additional QI projects such as the one targeting infant ART initiation.

Pre-ART: Pre-ART services were implemented satisfactorily according to KIs but have since been phased out with the implementation of the Test and Start guidelines. Training and mentoring on comprehensive services for HIV patients, including Integrated Management of Adult Illness (IMAI), are still being carried out as part of program activities. 76% of surveyed HCWs reported being trained in IMAI, just under the training target of 80%. As with HCW training on other topics, staff turnover remains a challenge in achieving training coverage at health facilities.

Recommendations:

- Consider implementation of a training-of-trainers model in facilities, in which higher level staff are capacitated to train incoming staff on IMAI and other topics. Alternatively, more frequent trainings may be needed in order to ensure the presence of trained staff at facilities.
- Strategies to support MOH in reducing staff turnover in facilities could also be considered. For example, encouraging the implementation of hiring criteria that prioritize employees likely to stay in a position long-term, and/or supporting facility management in efforts to improve employee satisfaction.

TB/HIV: ICAP has invested in training, mentoring, TA, human resources (HR) and other support towards integrating and improving the quality of TB/HIV services. These activities, along with ICAP's support to MOH for TB and TB/HIV services at a national level under Objective 1, were described by KIs as positively impacting TB screening and integration of TB/HIV activities at the national level. The program has generally performed well in the implementation of TB screening. Ninety percent of ICAP-supported facilities have facility-specific TB Infection Control Plans and have a policy of TB screening for all HIV patients on each visit. Eighty-six percent of facilities had successfully carried out that screening policy. The percent of ART patients screened for TB at their last visit has remained above 95% since the second half of FY17. The percent of patients screened positive who received diagnostic testing has been inconsistent, particularly in earlier years, ranging from 33% to 100%, but has remained at 100% over the last year. Similarly, out of those diagnosed with TB, the percentage receiving treatment was highly variable in FY17 and FY18, ranging between 29% and 97%, but throughout FY19, over 90% received treatment. The stagnant TB mortality rate and low numbers of patients initiating and completing TPT (29% and 27% of the F19 targets, respectively; 80% of ART patients initiating TPT in FY19 completed it) were identified as remaining gaps to be addressed.

Recommendations:

- Frequently monitor the percent of patients screened positive for TB who receive diagnostic testing and the percent diagnosed who receive treatment, to ensure that rates remain high.
- Work with facilities to identify and address barriers to TPT initiation (the primary focus, as it has the biggest gap) and completion (where there is still room for improvement). Consider implementation of new QI initiatives at facilities to address this issue. Approaches may include assigning targets to each facility, implementing motivational interviewing for couples with intensive supportive supervision by clinical mentors to improve client informed decisions, and use of fixed dose combinations for TPT.
- Continue ongoing QI work to address TB mortality rates, and scale up implementation of any successful strategies identified.

Prevention of mother-to-child transmission (PMTCT): The percentage of pregnant women living with HIV who receive ART has remained steadily high, between 96% and 100% each year since FY15. Thirty-six of 40 of ICAP-supported ART-initiating facilities (90%) have achieved 95% or greater ART coverage among pregnant women living with HIV. ICAP's support for expert clients was seen as key in the successful provision of PMTCT services. Although the proportion of HIV-exposed infants (HEI) testing positive remains low, at 2% in FY17 through FY19, the high percentage of HEI with unknown outcome at 18 months (34% in FY19) presents a challenge. Just half of the surveyed HCWs achieved competency in PMTCT services.

Recommendations:

- Continue/increase support for lay staff and mentor mothers who support the implementation of early infant diagnosis, as well as follow-up of families to reduce the number of HEI with unknown outcome.
- Mentor staff conducting follow-up to optimize tracking systems and identify the most effective strategies to reach clients.
- Consider implementation of a QI project to address high rates of unknown outcome among HEI at 18 months.

Maternal, Neonatal and Child Health (MNCH) and Sexual and Reproductive Health (SRH): ICAP has successfully provided mentoring visits at least monthly to both PEPFAR-supported labor and delivery sites in Manzini. The integration of family planning services into HIV services remains a challenge, though it has occurred at 36 of 40 ICAP-supported ART-initiating facilities. The rollout of cervical cancer screening to 22 facilities, which ICAP supported through training, staffing, infrastructure improvements and renovations, was seen as a success by facility representatives. However, the number of cervical cancer screenings conducted in FY19 was approximately half of the target number for the year, mainly due to delays in setting up the service in the targeted facilities, including deployment of nurses to conduct the screening. Of those who screened positive for cervical cancer in FY19, 70% received treatment.

Recommendations:

- Work with facility staff to identify strategies to support FP service integration into HIV services, particularly at larger facilities such as hospitals.
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- Consider various approaches/levels of integration based on facility and patient needs, such as offering select FP services in the ART clinic, or simply creating a strong referral link to the MCH unit in the same hospital.
- Ensure that sufficient supplies are available for cervical cancer screening at facilities; consider supporting additional staff to conduct screening at facilities if needed. Continue to support the rollout of screening to additional facilities.

Work with facilities to identify where patients screening positive for cervical cancer are lost to care, and develop and implement strategies to address this gap. At hospitals and clinics that have implemented a "screen and treat" approach, additional mentoring of HCWs conducting cervical cancer screening to provide cryotherapy may be needed. Increasing the capacity of facilities that provide loop electrosurgical excision procedure (LEEP) services may be required to reduce the backlog and number of patients lost to care.

1.0   Background

The dual burden of human immunodeficiency virus (HIV) and tuberculosis (TB) remains the most critical public health and human development challenge facing the people and Government of the Kingdom of Eswatini. It is estimated that 27% of adults aged 15-49 in Eswatini are currently living with HIV, and there are approximately 6,000 new cases annually among adults aged 15 years and older[1]. The high TB mortality rate (10% for all forms of TB in 2018[2]) is inextricably linked to the country's HIV epidemic; approximately 70% of TB patients are co-infected with HIV[1]. Over 25% of deaths in people living with HIV (PLHIV) are caused by TB, and mortality is 5.5 times higher among TB patients who are co-infected with HIV[3].

Though significant challenges remain, Eswatini has made rapid strides in the fight against HIV and TB in the past decade. Support for comprehensive HIV prevention, care and treatment programming, including TB/HIV collaborative activities, has been provided by the President's Emergency Plan for AIDS Relief (PEPFAR) and other funders, contributing to the dramatic improvements in treatment coverage and outcomes. The percentage of TB/HIV co-infected patients receiving both antiretroviral therapy (ART) and TB treatment doubled from 35% to 70% between 2010 and 2013, and ART provision within TB clinics contributed to a 50% reduction in mortality in such patients during this time[4]. Prevention of mother-to-child transmission of HIV (PMTCT) reached a milestone of 98% coverage nationally in 2013[5]. Under the TB National Strategic Plan (2015-2019), Eswatini achieved a treatment success rate of 86% for all forms of TB in 2018, compared to 73% in 2017. The TB incidence rate also decreased during these years, from 398 per 100,000 population in 2017[3] to 308 per 100,000 in 2018[2]. HIV testing uptake among patients with TB has increased from 95% in 2014 to 99% in 2018[1], while the TB mortality rate among patients coinfected with TB and HIV declined from 84 per 100,000 population in 2017 to 44 per 100,000 in 2018[2]. Meanwhile, prevalence of viral load (VL) suppression among all HIV-positive adults aged 15 years and older reached 73% in 2017[1], and cotrimoxazole preventive therapy was provided to 98% of patients with HIV in 2014, and to 100% in 2018[2].

As a PEPFAR implementing partner (IP) since 2005, ICAP at Columbia University has been closely involved in the efforts to address HIV and TB in Eswatini. In 2015, as part of an integrated phase of TB and HIV service expansion supported by PEPFAR, ICAP received a five-year regional cooperative agreement (CoAg) through the U.S. Centers for Disease Control and Prevention (CDC): *Strengthening Local Capacity to Deliver Sustainable Quality-Assured Universal Coverage of Clinical TB/HIV Services in Manzini Region, and Provide Central Level Technical Assistance (TA) to the National Tuberculosis Control Program in the Kingdom of Eswatini Under the President's Emergency Plan for AIDS Relief (PEPFAR)*. This program is focused on supporting the Ministry of Health (MOH) and health care facilities to reduce HIV and TB incidence and improve outcomes in Eswatini. Specifically, the three strategic objectives of this program are:

1. To provide national-level technical assistance to the National TB Control Program (NTCP) for TB/HIV activities;

2. To support capacity building of the Regional Health Management Team (RHMT) in order to strengthen their stewardship, ownership, and quality management of TB/HIV service delivery; and

3. To support comprehensive HIV services activities in Manzini to improve coverage and quality of provider-initiated HIV testing and counseling (PIHTC), prevention of mother-to-child transmission of HIV (PMTCT), TB, TB/HIV, HIV care, pediatric antiretroviral therapy (ART), and adult ART, in line with World Health Organization (WHO) guidelines, at public, mission, industrial, and private health care facilities and in community settings in Manzini.

The program began in April 2015 and will end in September 2020. The program logic model (Appendix A) summarizes the sub-objectives, activities and target outcomes under each objective. A key aspect of the program is providing support to health facilities in Manzini region, where a third of the population (34.8%) lives[1], on the delivery of HIV/TB services. At the time of the writing of this report in program year 4, Manzini region had 130 health care facilities and ICAP was supporting a total of 43 of these facilities (Table 1).

Table 1. Distribution of health facilities in Manzini region

	Number of facilities*	Number of ICAP-supported facilities, September 2019**
Type of facility		
Public, mission or NGO clinics	55	39
Public Health Units (PHUs)	2	2
Public hospitals	2	2
Private hospitals	3	0
Industry clinics	16	0
Private clinics	52	0
Total	**130**	**43**
Services provided		
TB (BMUs)	25	24
PMTCT	52	36
HIV Testing Services (HTS)	94	43
HIV care	94	43
ART – initiation	54	40
ART – refills only	83	3

*Source: Service Availability and Readiness Assessment (2017) MOH: Eswatini[6]
**Source: ICAP program records, 2019

2.0 Evaluation Purpose and Questions

A combined mid- and end-term evaluation of the program, which included both process and outcome evaluation components, was conducted during the fourth year of the program (PY4). The purpose of this evaluation was to provide an assessment of program implementation and achievements, including the fidelity, dose, and reach of ICAP's technical assistance. Program evaluation is an important element for program implementation because it helps to describe successful strategies in implementation, as well as challenges and areas where additional work is needed. Findings will be used by ICAP, MOH, and CDC to improve the implementation of HIV- and TB-related programs in Manzini, and highlight needs—and potential strategies—for TB and HIV capacity building at the national, regional, and facility level.

The program logic model (Appendix A) explains the theoretical underpinnings between the five evaluation questions listed below and the program interventions. From the logic model, program performance measures (indicators) were extracted and documented in a program evaluation framework (Appendix B). It is important to note that since 2015, some changes in the program sub-objectives and related PEPFAR performance targets have occurred in response to evolving MOH priorities and WHO guidance. To account for this, relevant additional information on newer program activities and outcomes is also included in the evaluation framework and evaluation report.

Evaluation questions:

Process evaluation questions:
- *To what extent have the planned program activities been implemented?*
- *To what extent have health care workers (HCWs) received quality trainings and mentoring support?*
- *To what extent has ICAP supported institutional development needs of the RHMT to reposition them in their stewardship role for quality health service delivery in the region?*

Outcome evaluation questions:
- *To what extent have the number of health facilities providing comprehensive HIV care services increased in the region?*
- *To what extent has the number of individuals who are aware of their HIV status and receive appropriate services increased in the region?*

3.0   Evaluation Design

This evaluation was designed and conducted in line with CDC's framework for program evaluation in public health[7] and PEPFAR's Evaluation Standards of Practice (ESoP)[8]. The process and outcome evaluation design utilized: (1) routine program administrative data and record review to assess which of the planned program activities have been carried out; (2) key informant interviews (KIIs) to assess the extent to which interventions were delivered and received (dose), implemented as designed (fidelity), and available and accessed by the intended beneficiaries (reach); and (3) a survey of HCWs to assess capacity to provide comprehensive HIV care, ART, PMTCT, and TB services. This approach provides the ability to triangulate findings across multiple data types (qualitative and quantitative) and sources (program records, stakeholder descriptions, and HCW surveys).

The evaluation team consisted of an external evaluator, an ICAP evaluation specialist, and an ICAP research director. The evaluation was also supported by the ICAP headquarters team, including Strategic Information (SI) specialist and principal investigator.

The total cost for the budget for the evaluation activities at the time of report writing was estimated to be $91,037.51

3.1 Stakeholder involvement

In line with the PEPFAR 2017 Evaluations Standards of Practice (ESoP) version 3.0[2], key stakeholders were involved in the design and implementation of the evaluation. Select MOH staff from the national and regional levels who had been involved with program activities were engaged throughout the evaluation cycle. MOH national staff were part of the evaluation protocol writing team and shared insights on evaluation design. Stakeholders continued to play an active role throughout the planning process by reviewing and refining evaluation questions, methods, and measurement tools, and during the data collection process by providing information as key informants and survey participants (see Table 2 for the list of organizations represented).

During data analysis and writing of the draft report, stakeholders from the MOH (both national and regional levels), health care facilities, and other organizations assisted with the interpretation and framing of findings, and with developing or providing input on recommendations for program action based on evaluation results. Stakeholders were invited to provide input on the draft report, and feedback was incorporated into the final report. A list of contributing stakeholder organizations is included in Appendix

C. Finally, stakeholders will continue to be engaged in evaluation following dissemination, by endorsing and/or implementing the evaluation recommendations in the final year of the program.

4.0 Methods

4.1 Program Administrative Records and Data Review

The evaluation included critical examination of program documents [e.g. Annual Progress Reports (APRs), workplans, internal communications, training records, and the guidelines, curricula, job aids and other materials that were developed by the program], as well as routine program monitoring data, to review the progress made against the program work plan. Program data on PEPFAR Monitoring, Evaluation, and Reporting (MER) indicators for ICAP-supported facilities[9] were accessed through the ICAP Eswatini Aggregate Database (ISAD) system, the in-country aggregate database for analysis and visualization of program data, and through the Integrated Strategic Information Global Health Tracker (INSIGHT), ICAP's central multi-country aggregate data management, analysis, and visualization system. Findings were verified against the data recorded on PEPFAR's Data for Accountability, Transparency and Impact (DATIM) platform. Indicators were assessed in reference to ICAP-specific annual MER targets, which are set annually by PEPFAR.

For each objective and sub-objective in the program logic model (Appendix A), completed program activities were summarized. For each performance indicator in the evaluation framework (Appendix B), results were documented using the tool as achieved, partially achieved, or not achieved. If not yet achieved, or partially achieved, a narrative explanation was documented, and the indicator was identified as an area of focus for the final year of the project.

4.2 Key Informant Interviews

KIIs were conducted in July 2019 with 20 informants who had experience with the program to obtain a comprehensive assessment of the strengths and challenges of implementation (Table 2). Participants were selected by purposive sampling to represent stakeholders with a high-level understanding of Eswatini HIV and TB health system issues across the key areas intended to benefit from ICAP support. Interviewees included senior MOH officials from the NTCP, Manzini RHMT members, staff from facilities in the Manzini region, representatives of the program funder (CDC), members of other MOH departments/programs, and representatives of other organizations. Perspectives and experiences related to each of the three program objectives were represented.

Interviews were conducted individually and in-person by the ICAP in Eswatini evaluation specialist, at a location of each participant's choosing. Written informed consent was obtained from all interview participants. A semi-structured interview guide (Appendix D) provided a general format for the interviews, and additional probing questions were tailored by the interviewer to address specific areas of each participant's experience and expertise related to the program. Questions addressed topics such as the participant's experiences in program activities; challenges and key elements of success in expanding TB/HIV services; implementation of planned HCW training and mentoring; utility of ICAP-led technical assistance and capacity building in increasing RHMT stewardship of quality health service delivery; reasons why work plan elements were not implemented as expected; and observed changes in knowledge and capacity to sustain program activities as a result of the technical assistance provided.

Table 2. Key informants and program objectives addressed

Category	Organizations represented	Number of key informants*	Program objectives addressed**
MOH National	NTCP	2	Objective 1
	Eswatini National AIDS Program (ENAP), Eswatini Health Laboratory Services (EHLS)	4	Objectives 1,3
MOH Regional	Manzini Regional Health Office, Sexual and Reproductive Health Unit (SHRU), Manzini Regional SID (Strategic Information Department)	5	Objectives 2, 3
Facility	AIDS Healthcare Foundation (AHF) Lamvelase Clinic, Raleigh Fitkin Memorial (RFM) Hospital, Mankayane Hospital, King Sobhuza (KS)11 PHU	4	Objective 3
	National TB Hospital (NTBH)	1	Objectives 1,3
Other organization	WHO, Elizabeth Glaser Pediatric AIDS Foundation (EGPAF)	2	Objectives 1,3
Funder	CDC	3	Objectives 1,2,3

*Please note that some key informants represented more than one organization, as they had changed organizations during the grant period. Thus the numbers in this column sum to greater than the number of interviews (n=20).
**Program objectives are listed in the Background section of this report (section 1.0) and in Appendix A.

Interviews were audio-recorded and transcribed verbatim; personal identifiers were redacted in order to anonymize the transcripts. Qualitative analysis was conducted in QSR NVivo 12 software[10] using a framework analysis approach[11]. Two members of the evaluation team, through reading of transcripts, identified preliminary codes based on key themes and recurrent ideas in the data that were relevant to the evaluation questions. These themes were critically discussed until consensus was reached on an initial draft codebook. An iterative process in which both analysts independently coded a selected transcript, compared and discussed results, and refined the codebook accordingly was then repeated until the codebook was determined to be sufficiently comprehensive and reliable. The final codebook was then used to code all transcripts. The first three transcripts were coded by both analysts to establish coding consistency; one analyst then coded the remaining 17 transcripts. Coding reports and cross-tabulations were created to summarize findings in relation to the evaluation questions, and representative quotes were selected for inclusion in the report.

4.3 Health Care Worker Survey

A survey was conducted in July 2019 among HCWs at selected ICAP-supported facilities in Manzini region to assess capacity to provide comprehensive HIV care, ART, PMTCT, and TB services. The survey (Appendix E) consisted of closed-ended questions that captured information on knowledge (for clinical staff only) and self-efficacy (for all respondents) in provision of these services, as well as professional qualifications and training experience. Survey participants were HCWs who met the following inclusion criteria:

1. Clinical (doctor, nurse, nursing assistant) or lay cadre staff (lay HTS counselor, expert client, etc.) at one of the included sites
2. Currently working in the provision of comprehensive HIV, TB/HIV and PMTCT services
3. Willing to participate in the survey

A multi-stage stratified random sampling design was used to sample 254 HCWs from approximately 1,328 HCWs across the 43 ICAP-supported facilities in Manzini region. Since there are only two hospitals and two PHUs that are ICAP-supported, these four facilities were included in the sample a priori. The remaining facilities (clinics) were stratified by their mentoring cluster. A cluster is a grouping of facilities in which one larger "hub" facility, typically a hospital, provides clinical and technical mentoring to multiple smaller clinics, or "spokes." The ICAP-supported clinics were part of three mentoring clusters (Mankayane Hospital, RFM Hospital, and a mixed cluster); within each of these three strata, 50% of clinics were randomly sampled for inclusion in the survey. Because random selection of individual HCWs within each facility was not feasible, a target sample size for each type of worker (clinical or lay cadre) at each selected facility was calculated, proportional to the total number of HCWs of that type at the facility, and based on a target total enrollment sample size of 250. Convenience sampling was then used to enroll participants at each facility until the target sample sizes of lay and clinical workers were approximately reached. All HCWs working in the selected facilities and available on the date of survey administration that met inclusion criteria (above) were eligible to participate.

Access to the facilities was facilitated by MOH, which provided letters of introduction to facility management; dates of survey administration at each facility were scheduled in advance. Verbal informed consent was obtained from all participants. Survey responses were anonymous and were not linked to identifying information. Survey data were collected via encrypted tablet using ODK Aggregate and stored on a secure password-protected database running on MySQL housed on the ICAP server.

Descriptive data analysis was conducted using Stata 15 software[12]. Because clinics were represented in the sample at 50% while hospitals and PHUs were represented at 100%, a 2x sampling weight was applied for the clinic-based HCWs. The proportion of HCWs responding correctly to knowledge questions on the provision of various thematic components of comprehensive HIV care, ART, PMTCT, and TB services was calculated. A combined score of at least 66% correct responses on all questions in a given content area was defined as 'competency' in that area. This cutoff point was chosen a priori based on the fact that most of the content areas on the survey consisted of either three or four questions; requiring a score of at least 66% meant that a respondent had correctly answered the majority of questions on that topic (2/3 or 3/4) and did not restrict "competency" to only those with a perfect score. The proportion of respondents achieving competency in each knowledge area was calculated, and the proportion competent was compared across categories (e.g., clinical role) using Fisher's Exact tests to account for small cell counts. The mean (standard deviation [SD]) self-efficacy score for providing HIV and ART clinical care, PMTCT care, HIV testing and counseling, and adherence and psychosocial counseling based on the self-efficacy Likert scale was also calculated. Ninety-five percent (95%) confidence intervals accounting for site-level clustering and with finite population corrections were calculated for survey outcomes.

4.4 Synthesis of findings

The synthesis of findings was guided by key interrelated components: the evaluation questions, the logic model (Appendix A), evaluation framework (Appendix B) and a selection of PEPFAR MER indicators[9] specific to the program deliverables. Data drawn from the three described methods (administrative record and aggregate data review, HCW survey, and KII) were organized using the evaluation framework (Appendix B) to answer the program's evaluation objectives, i.e., was the program implemented as planned (fidelity), did it reach the right population (reach) and was it implemented among the targeted population at a sufficient scale (dose). Further details on evaluation methods are available in the evaluation protocol (Appendix I).

5.0   Ethical considerations

This evaluation protocol was reviewed and approved by the CDC Center for Global Health Office of the Associate Director for Science and was determined to not meet the definition of research. Institutional Review Board (IRB) approval was obtained from Columbia University IRB and local (Eswatini) ethical approval was granted by the National Health Research Review Board (NHRRB). Table 4 below shows the dates when current IRB approvals were obtained.

Table 3. Dates of ethical approvals for evaluation activities

Institutional /Ethical Review Board	Approval date
Columbia University IRB	March 7, 2019
Centers for Disease Control and Prevention	April 24, 2019
National Health Research Review Board	June 13, 2019

All evaluation staff completed training on Good Clinical Practices and research ethics prior to their work on the program. Conflict of interest statements (Appendix F) were signed by all evaluation staff. As described above, informed consent was obtained from all participants. The written informed consent form for KII participants is included as Appendix G, and the verbal consent script for survey participants is attached as Appendix H. Every effort was made to ensure that participant identity and information was kept confidential. Any quotes or text used in this evaluation were anonymized to protect participants from any personal identifiers. There were no deviations and adjustments made from the IRB approved protocol. The evaluation team provided regular progress updates to the implementation team as part of internal monitoring and CDC in-country staff conducted sponsor monitoring activities through email correspondence, telephone calls and meetings to ensure that data are of the highest achievable quality.

6.0   Findings

Evaluation findings are structured according to the program sub-objectives listed in the evaluation framework table (Appendix B). The evaluation framework table provides an overview of program achievement based on the selected indicators specified in the evaluation protocol for each sub-objective. The following narrative provides expanded details and context regarding these and additional relevant progress and outcome indicators. Under each sub-objective, key program activities are described, followed by an assessment of the program's achievements on targets and indicators.

6.1 Survey participant characteristics

Characteristics of the 254 participating HCWs are shown in Table 4. Approximately half were nurses, one-third were lay cadres, and one-tenth were nursing assistants, while the number of doctors who participated (n=6) represented just 2.5% of the total sample. Numbers were about evenly split between those working in hospitals/PHUs and those working in clinics. Respondents had been in their current position an average of 5.6 years. A majority (80%) were female.

Table 4. Characteristics of HCW survey participants at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Characteristic	Participants
Total n (%)	254 (100%)
Clinical role: n (%)	--
Doctor	6 (2%)
Nurse	131 (52%)
Nursing Assistant	27 (11%)
Lay Cadre	90 (35%)
Facility type: n (%)	--
Hospital/PHU	132 (52%)
Clinic	122 (48%)
Sex: n (%)	--
Female	202 (80%)
Male	52 (20%)
Years in current position: mean (SD)	5.6 (4.7)

6.2 Objective 1: National-level TA and capacity building for TB activities

The first program objective was to "Enhance TB service delivery through national level TA and capacity building support to MOH and the NTCP for all TB and multi-drug resistant TB (MDR-TB) related activities, including TB/HIV collaborative activities in TB settings."

6.2.1 Sub-objective: Support updating of TB/MDR-TB policies, guidelines, standard operative procedures (SOPs), training curricula and job aids

Key activities for national TB guidelines and SOPs

Updating of guidelines, policies and tools

ICAP provided TA to the NTCP to support the development and updating of TB and MDR-TB policies and guidelines, as well as supporting printing and distribution of these materials to health facilities and other stakeholders:

- Revision of the national strategic plan for TB diagnostics and laboratory diagnosis of drug-sensitive TB (DS-TB) and drug-resistant TB (DR-TB) (FY15)
- Finalization of TB active case detection strategy and SOPs (FY15)
- Finalization of the bedaquiline implementation plan (FY15)
- Development of bedaquiline and delamanid guidelines (FY16)
- Review and adaptation of interim short course treatment for MDR-TB guidelines (FY16-17)
- Development of new consolidated DS-TB and DR-TB adult and pediatric guidelines and updating of the National TB Manual (FY18-19)

Additionally, the following tools and job aids were developed, approved by MOH, printed, and distributed:

- National TB monitoring & evaluation (M&E) indicators and tools (FY16)

- Tools to identify and provide isoniazid preventive therapy (IPT) for child contacts of active TB cases, including contact tracing tools, IPT register, patient card and monthly reporting format (FY17)
- TB preventive treatment (TPT) register (FY18)

Curriculum development and national-level training of HCWs

Three national training curricula for doctors and nurses have been developed and/or updated and finalized with ICAP's support: (1) Short course MDR-TB regimen, (2) TB/HIV for nurses, and (3) DR-TB/HIV.

ICAP also provided TA and logistical support to NTCP to conduct country-wide training of HCWs in the management of DR-TB and DS-TB. This included:

- 94 HCWs trained on DR-TB (FY16)
- 116 HCWs trained on MDR-TB short treatment regimen (FY17)
- 75 nurses from 13 correctional services health facilities and 30 lecturers from two universities trained on management of HIV/TB co-infection (FY16-18)

Additionally, as part of the work plan under sub-objective 1.1, the program was originally intended to support nursing institutions in incorporating DS-TB and DR-TB into pre-service curricula. However, this work was instead completed under a concurrent ICAP TA project that was separate from the present CoAg.

Evaluation results: National TB guidelines and SOPs

Process indicator: *National TB guidelines updated, developed and finalized*

Three new and/or updated sets of guidelines have now been finalized with the support of ICAP.

In KIIs, multiple national-level MOH representatives and funder representatives confirmed ICAP's contribution to the consolidated DS-TB and DR-TB guidelines. One key informant commented, "I must say that ICAP really kick started this… and when it looked like it was stalling, they really tried to work with it to try and get us up to fast track to finish. So we are currently at a stage where we have the final guidelines." Similarly, when asked about ICAP's printing of guidelines and job aids, another stakeholder confirmed that, "yes, they supported printing… they have done it, yes, diligently."

Outcome indicator: *80% of all practicing nurses in Eswatini are competent in delivery of TB and MDR-TB services (including TB/HIV collaborative activities in TB settings)*

Thirty-seven percent of surveyed nurses were 'competent' in TB (scoring 66% or greater on the TB knowledge portion of the questionnaire); this proportion is well below the target of 80%. It should be noted that HCW survey findings serve as a proxy measure for this outcome, since they represent a subset of nurses practicing in Manzini region and may not reflect the competency of all nurses regionally or nationwide.

The number and proportion of clinical staff achieving competency is shown in Table 5 (lay cadre staff did not complete the clinical competency section of the survey). Compared to nurses, a significantly higher proportion of doctors (86%) and lower proportion of nursing assistants (25%) achieved a 'competent' score (Fisher's exact, $p < 0.01$). Table 6 shows the proportion staff who are TB-competent at BMUs (40%) compared to other facilities (34%); this difference was not statistically significant. Of note, 24 of the 43 ICAP-supported facilities are BMUs, and 13 are DR-TB treatment sites. However, basic TB/HIV services are provided at all facilities.

Table 5. Weighted proportion of HCWs achieving competency in TB services and mean self-efficacy score in TB service provision by clinical role at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Clinical role	HCWs achieving competency* in TB services Weighted %	Mean self-efficacy score in TB service provision**				
		Manage TB/HIV coinfection Weighted mean (SD)	Adult DS-TB services Weighted mean (SD)	Pediatric DS-TB services Weighted mean (SD)	Adult DR-TB services Weighted mean (SD)	Pediatric DR-TB services Weighted mean (SD)
Doctor (n=6)	86%	4.1 (1.1)	3.9 (1.5)	3.4 (1.4)	3.4 (1.4)	3.1 (1.2)
Nurse (n=131)	37%	3.7 (1.1)	3.1 (1.2)	2.7 (1.1)	2.8 (1.1)	2.5 (1.1)
Nursing assistant (n=27)	25%	3.9 (1.1)	3.7 (1.1)	3.4 (1.1)	3.5 (1.0)	3.1 (1.0)
Lay cadre (n=90)	***	3.7 (1.2)	3.0 (1.2)	2.7 (1.2)	2.8 (1.3)	2.6 (1.2)
Total (n=254)	**37% (n=164)**	**3.7 (1.1) (n=232)**	**3.1 (1.2) (n=213)**	**2.8 (1.2) (n=209)**	**2.9 (1.2) (n=205)**	**2.6 (1.1) (n=206)**

*Based on a combined knowledge score of at least 66% on TB/MDR-TB survey questions
**On a Likert scale with 1="Not at all confident" and 5="Extremely confident"
***Lay cadre were not surveyed on clinical competencies

Self-efficacy to provide TB services was also measured, using a 1-5 Likert scale with a score of 1 meaning "Not at all confident" and 5 indicating "Extremely confident." The mean self-efficacy score for management of TB/HIV coinfection was 3.7 (SD: 1.1), management of adult DS-TB was 3.1 (1.2), adult DR-TB 2.9 (1.2) pediatric DS-TB 2.8 (1.2), and pediatric DR-TB, 2.6 (1.1) among all HCWs. Self-efficacy scores by clinical role and by facility TB services are shown in Table 5 and Table 6, respectively.

Table 6. Weighted proportion of HCWs achieving competency in TB services and mean self-efficacy score in TB service provision by type of TB services offered at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Services provided at facility*	HCWs achieving competency** in TB services Weighted %	Mean self-efficacy score in TB service provision***				
		Manage TB/HIV coinfection Weighted mean (SD)	Adult DS-TB services Weighted mean (SD)	Pediatric DS-TB services Weighted mean (SD)	Adult DR-TB services Weighted mean (SD)	Pediatric DR-TB services Weighted mean (SD)
TB management services (BMU) (n= 89)	40%	4.1 (1.2)	3.6 (1.1)	3.2 (1.1)	3.2 (1.2)	2.9 (1.2)
TB/HIV services only (not BMU) (n= 165)	34%	3.5 (1.0)	2.8 (1.2)	2.6 (1.2)	2.7 (1.2)	2.5 (1.2)
Total (n=254)	**37% (n=164)**	**3.7 (1.1) (n=232)**	**3.1 (1.2) (n=213)**	**2.8 (1.2) (n=209)**	**2.9 (1.2) (n=205)**	**2.6 (1.1) (n=206)**

*Based on individual participant survey response describing the facility's TB services
**Based on a combined knowledge score of at least 66% on TB/MDR-TB survey questions
***On a Likert scale with 1="Not at all confident" and 5="Extremely confident"

Responses from key informants lend some support to the survey results. Six KIs with relevant expertise were asked if they thought that 80% of all practicing nurses in Eswatini are now competent in delivery of TB and MDR-TB services; five of the six said no. One estimated, "I would say half [are competent in TB and MDR-TB services]. Even 50 percent, I don't think people are competent because I myself I'm not competent [laughs] you see and I'm a trainer." Another elaborated:

> The facilities that don't have BMUs [TB Basic Management Units] may not necessarily be trained, that's why it cannot be 80 percent. And DR-TB services are even more limited… so the training is limited to those few facilities. So I don't think we are at 80 percent right now. Maybe we are 50, maybe we are 60 but we are not 80 percent, especially if we use the word competent, people may have gone through some training but it doesn't equal competence. Competence is when they are practicing and they are doing it.

Other qualitative findings:

KII participants representing MOH and other organizations generally reported that training activities on the updated guidelines were carried out well; One interviewee commented that "ICAP was really assisting in terms of ensuring that this [training] was done." Several noted that ICAP's support to the NTCP to implement structured planning and scheduling for trainings was particularly helpful. However, some participants identified limitations regarding training. Two KIs commented that training coverage for nurses was limited by the level of funding. Additionally, regarding the structure of trainings on TB, one respondent said, "I will recommend… if [the TB training] could be the way NARTIS is where we train, and then there is the post training, post analysis I think that will be good and also people go back to the facilities, do the practicals and come back and report."

6.2.2. Sub-objective: Build capacity to implement national performance standards for TB, MDR-TB and TB/HIV

Key activities for capacity-building to implement national TB performance standards

ICAP's role in capacity-building of the NTCP and health care facilities in all regions of Eswatini encompasses a wide range of activities and areas of focus at multiple levels.

Human resources (HR) support

To strengthen technical and programmatic HR for the NTCP, ICAP has provided full salary support for the following technical positions:

- Programmatic Management of DR-TB Technical Advisor (FY16-19): This position supports coordination and quality assurance of clinical services for MDR-TB.
- M&E Advisor (FY16-19): This position supports M&E activities at the NTCP.
- Laboratory Advisor (FY16-17): This position supported laboratory activities at the NTCP.
- TB IPC Coordinator (FY17-19): This position supports the implementation of TB infection prevention and control (IPC) activities.
- TB/HIV Technical Advisor at ENAP (FY16-19): This position supports national coordination of TB/HIV collaborative activities.

Training of NTCP staff

ICAP provided training in quality improvement (QI) processes to 15 NTCP program staff (4 regional coordinators, 5 DR-TB program officers, 2 national M&E and 4 regional M&E officers) during FY16. ICAP also facilitated two senior staff from the NTCP to attend an international training on clinical and programmatic management of DR-TB that was organized by the International Union Against Tuberculosis

and Lung Disease in Bangkok, Thailand during FY18. Similarly, ICAP supported the training of two staff from the NTCP to participate in the 10th International Child TB Training in Cape Town, South Africa, also during FY18.

TA to support country-wide training and mentoring of HCWs

ICAP has provided TA and logistical support to the NTCP for the planning, coordination and execution of country-wide training and mentoring for HCWs. In addition to the training on updated national guidelines described previously in section 6.2.1, ICAP supported other country-level trainings, including:

- 118 TB focal persons from BMUs trained on IPC (FY16-18)
- 38 HCWs trained on urinary TB lipoarabinomannan (LAM) test (FY18)

ICAP also worked with NTCP to coordinate countrywide training activities through the development of a training work plan and schedule.

In addition to training, ICAP has supported the provision of TB mentoring services at a national level; in FY18, the program provided TA to develop a national framework for TB mentorship. The proposed framework was based on a cluster 'hub-and-spoke' model, and entailed clinicians at local hospitals supporting the clinics in their cluster, while mentors from the regional implementing partner (IP) organization would serve as external mentors dealing primarily with complex clinical management issues. This was intended to build a sustainable mentorship system by shifting primary mentorship responsibilities from IPs to local clinical staff. However, this framework was ultimately not endorsed and implemented by the MOH due to the limited number of clinicians available to take on mentorship responsibility in their respective clusters.

TA to support DR-TB services

Technical and logistical support was provided to NTCP to carry out the following activities:

- A rapid assessment of DR-TB services in the country during FY16.
- Decentralization of TB services throughout the country through the accreditation of health facilities as DR-TB treatment sites. Three DR-TB treatment sites were accredited in FY16, and another two in FY18, bringing the current total to 13 from an initial number of 8.
- During FY16 and FY17, ICAP provided TA directly to the NTBH via bi-weekly visits for clinical case conferences on management of DR-TB patients.
- ICAP has supported the Clinical Access Program Committee for the use of new and repurposed drugs (bedaquiline and delamanid) from FY15 through FY19. This included conducting three clinical expert meetings with clinicians during FY18 to discuss use of the drugs, treatment outcomes, and QI initiatives.

TA to support TB/HIV collaborative activities

Some of the support towards the strengthening of TB/HIV collaborative activities has been previously described, most notably the TB/HIV Technical Advisor position supported at ENAP. Additional activities supported by ICAP include the work of the National TB/HIV Coordination Committee (NCC), to which ICAP provides TA and logistical support. ICAP coordinated and provided technical expertise in quarterly NCC meetings in FY17 and three meetings in FY18. Results from these meetings informed the incorporation of TB/HIV indicators into the Client Management Information System (CMIS), the national electronic medical record (EMR) system. NCC meetings also addressed clinical TB/HIV practice, such as the feasibility of using a fixed dose combination regimen to increase use of IPT, and the incorporation of lateral flow urine lipoarabinomannan (LAM) assays as point-of-care TB screening among patients with advanced immunodeficiency. Outside of the meetings, ICAP supported the integration of TB LAM assays into clinical

practice by providing TA to update the TB diagnostic algorithm, and providing training and job aids on the use of the TB LAM test in facilities. ICAP also participates in the TB Technical Working Group (TWG).

Support of research activities

ICAP provided TA and logistical support to the NTCP's research unit during the development of the first National TB Research Agenda in FY17. ICAP has provided support for national surveys conducted under this agenda, including review of the design, sampling methods and data collection approaches for the TB Prevalence Survey. The program also provided some support for the implementation of the national TB Drug Resistance Survey, though ICAP was not engaged in the development of the protocol for this project. During FY18 and FY19, ICAP supported the NTCP in the dissemination of key findings from the DR-TB survey and the translation of findings into policy.

Support of data collection and reporting systems and M&E processes

ICAP supported the strengthening and improvement of national and regional-level systems for M&E, data collection and review processes. Relevant activities include the previously noted support of an M&E Advisor at the NTCP, and the activities described below.

>   (i)   *Development of MDR-TB EMR system and integration into CMIS:*

ICAP supported the NTCP in the development of an EMR system for DR-TB to replace the previous paper-based system and allow real-time exchange of data with the NTCP M&E system. Specifically, ICAP provided TA to align the new DR-TB database with reporting requirements, re-designed the interface, revised the backend, and performed functionality testing in FY15 and FY16. Once the EMR was fully functional, ICAP also provided training and mentoring on its use, and performed preventative maintenance on the system.

After MOH rolled out the first version of CMIS, the national EMR, ICAP provided TA during FY16 and FY17 to ensure that the function of the DR-TB database was integrated into the national system as a part of a newly built TB module. Integration was fully completed into CMIS version 2.0 during FY18. ICAP continued to participate in workshops and meetings with the CMIS development team in FY17 and FY18 to further improve CMIS functioning.

>   (ii)   *Participation in national performance review meetings:*

During all program years, ICAP has participated in National Health Semi-Annual Review (NaHSAR) meetings. These meetings, which were originally established by ICAP prior to the present CoAg, provide a system in which regions are supported in setting performance targets for HIV, TB and other outcomes, assessing and presenting their results, and identifying areas for improvement. Those with high performance are awarded, and those with low performance receive support in the development and implementation of corrective action plans and other QA activities to address any quality challenges identified. ICAP has also supported Regional Health Semi-Annual Review (ReHSAR) meetings in Manzini region; an assessment of these activities is presented under the Objective 2 findings

Evaluation results: Capacity-building to implement national TB performance standards

Outcome indicator: *At least 80% of facilities in all regions supported by PEPFAR have met TB/HIV care and treatment performance standards established in partnership with NTCP and the quality management (QM) program*

This outcome could not be assessed at this time; QM standards were developed under a different CoAg managed by another IP, and have not yet been used to assess facilities. As one key informant stated:

>   *If you are looking at MOH tool that was recently developed, standards recently launched, they are still… I think it's just getting printed now if anything, so I don't think they would have assessed 80%*

of the sites by now and they wouldn't know whether 80% of the sites actually met the standard, they are still a bit far back… for the MOH standards, I don't think we are there yet…

However, "If they push, yes, they could achieve 80% by the end of the grant. Especially now that the tools are there, standards have been developed and finalized, yeah."

Other qualitative findings:

Key informants commented on ICAP's successes and remaining gaps in capacity-building of the NTCP. Several noted that the support provided for training activities was effective. As one participant described:

So when ICAP started … there was no structure so trainings were just done haphazardly, the work plans were not there, and the fact that even for DR-TB, it was like there is no program. So with the assistance of ICAP, they really pushed to make sure that NTCP has got the work plan, they follow the work plan in terms of trainings, [and] … know exactly when to train.

However, as previously described (National TB Guidelines and SOPs: Other qualitative findings, p. 24), other KIs identified limitations in coverage and quality of TB training, which are particularly salient in light of HCW's poor TB competency scores on the survey (p. 22-24).

Regarding capacity-building of the NTCP in collecting and managing performance monitoring data, KIs described improvements since the program began. One attributed this to ICAP's support of an M&E Advisor at NTCP:

In terms of the M&E, even when [ICAP] came the data quality was not good, but bringing in the M&E advisor to really interrogate on the data, we have seen our data even when we are presenting these annual reports, I think everyone have just commented that the quality is now good, we can actually see the progress.

Similarly, two respondents also noted improved integration of TB/HIV services within MOH, and both attributed this to the HIV/TB Technical Advisor position that ICAP supported within SNAP/ENAP. One observed:

…in the past there was [the] HIV program, then there was [the] TB program, but now with TB/HIV since there is that particular office, I see a lot of collaboration and integration of the TB/HIV and a lot of improvement. For instance, there is actually a work plan that … [ENAP is] able to follow [for] the TB/HIV services, and there are quite a lot of improvements at site level now. We have seen that there are now indicators for TB/HIV which they have been a gap, there are registers, there is everything…

Another key informant attributed improvements in DR-TB treatment success to ICAP's work:

…in terms of DR-TB, [when ICAP] came in I think treatment success was around 56% and now we are at like 74%, and the DR-TB program now has structure, people know that there is a DR-TB at each health center, at least a DR-TB clinic. They also assisted in decentralization of those activities when we came in, DR-TB was just at NTBH and a few sites, so we have now decentralized to get in sites ensuring senior hospitals they manage DR-TB.

KIs noted some challenges in implementation of support for certain research activities. Several identified the TB Drug Resistance Survey as an example; one commented that ICAP's limited engagement on this project was due to a "lack of communication with the National TB Control Program, that only made [NTCP] try to engage [ICAP] as partners… when they found a deficit in funding… they had already written the protocol, they didn't want to take the time to rewrite the protocol." Without the option to contribute to the protocol, ICAP could not support implementation of the survey, per CDC instruction.

Interviewees also identified remaining gaps in program activities. One reported that, "we have talked [with ICAP] about capacitating NTCP, like the focal people, we wanted them to be capacitated on program management," but noted that this training had not yet been done.

Finally, KIs felt that the transition to CMIS, and particularly the integration of the TB module and TB indicators (described on p. 26), still had room for improvement:

> *…the integration of TB into the [CMIS] is something which I think we still need to work on, and also if you look at the TPT, the TPT is using registers and when you talk to the programs, the data is not cascading frequent enough, so you would have expected also ICAP to assist… to make sure that the modules in CMIS are at a national level because in their work in, with the TB program… if you get a paper based system [in] the facility, it is a sign that it hasn't… been integrated into routine…*

6.2.3 Sub-objective: Conduct strategic quality improvement work/piloting of new approaches to inform evidence-based programming on TB and MDR-TB

Key activities for TB and MDR-TB QI

The program has contributed to TB QI activities at the national and regional levels. This has involved training facility staff on QI methodology and mentoring them in identifying and implementing facility QI plans. Results and lessons learned from each project have been synthesized, effective interventions identified, and findings presented to stakeholders. ICAP also continues to provide TA to the NTCP to identify suitable QI priorities.

During FY16, ICAP worked with NTCP to implement a regional TB QI Collaborative (QIC), with the aim of improving the TB treatment success rate at 14 facilities in Manzini from 78% in February 2016 to 90% in February 2017. Following completion of the project, treatment success was measured at 90% for the March-June 2017 treatment cohort. During FY17, ICAP provided TA and logistical support to the NTCP for the initiation of a national-level QIC to address the problem of unknown culture results at all 13 DR-TB facilities. Outcomes showed that unknown TB culture results were reduced from 30% in December 2017, before QI activities began, to 8% in September 2018. During FY18, a sustained 11% overall TB mortality rate prompted the initiation of QI work targeting this issue. ICAP first provided TA for the development of tools to conduct a national TB mortality audit, to collect more detailed information on causes of death. Findings from this exercise are being used by the program to inform the implementation of new QI projects addressing mortality among TB patients during FY19.

Evaluation results: TB and MDR-TB QI

Process indicator: *At least 3 reports summarizing approaches and findings of strategic QI work/piloting of new approaches to inform evidence-based programming on TB and MDR-TB are finalized and widely made available among stakeholders*

This measure has been partially achieved; one report on TB QI in Manzini was finalized and distributed during FY17. Results of the FY16 QIC were disseminated as a presentation rather than a report. A final report on the TB mortality QI work has not been developed, as the work is ongoing.

Other qualitative findings:

KI respondents highlighted the innovations in the current QI work around TB mortality. As one respondent described, "…already they [ICAP] assisted in developing tools for TB mortality, to start and document all these patients who have died and do something about it, which was like one of the first kind in most

countries, this has not been done [elsewhere]." Another further commented on the preliminary results and findings of this project:

> *…we have reduced [the TB mortality rate] to 10 percent because the death audits, ICAP supported us, we developed the death audit tool... But I think it's going to reduce [further] because we have found out that most of these TB patients, they die because of the renal failure, so these patients needs very close monitoring…*

Objective 1 Summary

Key evaluation indicators and results for Objective 1 are summarized in Table 7. ICAP's support resulted in the successful development and updating of three sets of national guidelines, including the DS-TB and DR-TB guidelines, as well as three HCW training curricula and related SOPs and job aids. This work received positive feedback from stakeholders and was seen as a strength of the program.

However, the evaluation target for the competency of practicing nurses in Eswatini in TB/MDR-TB services has not yet been achieved. Thirty-seven percent of surveyed nurses in Manzini achieved competency, which is well below the benchmark of 80% and indicates that training of HCWs, particularly nurses, on the new guidelines should be strengthened.

Capacity-building of the NTCP, and particularly the support of the HIV/TB and M&E Technical Advisor positions, were described as beneficial to national TB and HIV collaboration and data quality, respectively. In the area of M&E activities, the integration of the TB module and indicators into CMIS was identified as an area where additional work is needed. Additionally, early communication challenges with the NTCP limited collaboration between ICAP and the NTCP on some research activities, such as the TB Drug Resistance Survey. The percentage of facilities meeting TB/HIV performance standards was not able to be determined, since the standards were developed recently by another IP and have not yet been used to assess facilities.

QI activities to inform TB and MDR-TB services have been supported by ICAP throughout the program period, though only one report has been produced to date. MOH stakeholders commented positively on the innovative approaches to monitor and address TB mortality that are resulting from this work.

Table 7. Key evaluation indicators and results for Objective 1: National-level TA and capacity building for TB activities

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
1.1 Support updating of TB and MDR-TB policies, guidelines, SOPs, training curricula, & job aides	National guidelines updated, developed and finalized	Key informant interviews Program documents: • Bedaquiline and Delamanid Guidelines and Pocket Guide, 2016 • Short Course MDR-TB Interim Guidelines, 2017	Achieved	N/A	22
	TB/HIV training curricula updated, developed and finalized	Key informant interviews Program documents: • Short course MDR-TB regimen training curriculum • DR TB-HIV training curriculum	Achieved	N/A	22

		• TB-HIV Training Curriculum for nurses			
	80% of all practicing nurses in Eswatini are competent in delivery of TB and MDR-TB services (including TB/HIV collaborative activities in TB settings)	HCW survey Key informant interviews	Partially achieved	Estimates provided by HCW survey and KIs were lower than 80%	22-23
1.2 Build capacity to implement national performance standards and CQI processes	At least 80% of facilities in all regions supported by PEPFAR have met TB/HIV care and treatment performance standards established in partnership with NTCP and the QM program	N/A	Unable to assess	Facilities not yet assessed on NTCP/QM performance standards	26-27
1.3 Conduct strategic quality improvement work/piloting of new approaches to inform evidence-based programming on TB and MDR-TB.	At least 3 reports summarizing approaches and findings of strategic QI work/piloting of new approaches to inform evidence-based programming on TB and MDR-TB are finalized and widely made available among stakeholders	Program document: • DR-TB QI final report • TB treatment outcomes QIC presentation • QIC meeting reports and project summaries	Partially achieved	1 report finalized and distributed to date	28

6.3 Objective 2: Capacity-building of RHMT in Manzini

Under the second objective, the program sought to "Strengthen the Manzini RHMT's stewardship, ownership, and quality management of HIV/TB service delivery" in Manzini, the most populous region in Eswatini.

6.3.1 Sub-objective: Provide expert assessments to identify organizational development needs of the RHMT and assist in implementing institutional capacity building work plans to strengthen the institution's ability to effectively function as stewards of health services in the region

Key activities for RHMT baseline assessment, work plan development and capacity building

Baseline assessment

ICAP's original program work plan included conducting an expert baseline assessment of the Manzini RHMT to identify organizational development needs and key gaps in the leadership. This assessment was intended to build upon a World Bank assessment that was conducted in 2014 but never published. However, information gathered from program documents and confirmed by KIs showed that this activity did not happen as planned. Document review indicated that the RHMT expert assessment was not undertaken during FY15 due to limited resources and a delayed review of the RHMT roles and responsibilities by the MOH. Following this, the assessment was then supposed to be conducted as a rapid capacity assessment during FY16. However, as noted in APR16, this activity was again delayed due to the need for revision to RHMT's terms of reference for established regional quality improvement teams; ultimately there is no documentation indicating that a baseline assessment of RHMT took place.

Additional documents supplied upon request by the program team indicate that ICAP was able to move forward with capacity building activities for RHMT by making use the preliminary findings of the World Bank report and building upon ICAP's prior experience in providing support to RHMTs under other CoAgs.

Work plan development

During each program year, ICAP has supported the RHMT to develop and implement institutional capacity-building work plans to strengthen the institution's ability to effectively function as stewards of health services in the region. This was generally conducted as a workshop (though in FY18 it was carried out within RHMT monthly meetings to decrease costs). Focal persons were identified for the thematic areas in the National Health Sector Strategic Plan 11.

Capacity building

To build RHMT capacity to lead competency-based training, mentoring, and supervision for HIV and TB services, a number of capacity building activities were conducted by ICAP. Management workshops were conducted with RHMT leadership periodically beginning early in FY16. The workshops focused on orienting facility managers, newly promoted regional nurse managers and staff from the regional health office on budgeting and financial management, quality management, program updates and human resources management.

Additionally, technical assistance was provided to the Senior Health Administrator to be able to work effectively with the Manzini region team members, and meetings have been conducted routinely. ICAP also provided TA to harmonize all trainings and capacity building workshops in Manzini into one training calendar and logistical support to conduct supportive supervision. Regional trainings were conducted throughout the grant period which include Integrated Management of Adult Illnesses (IMAI) trainings, Nurse-led ART Initiation in Swaziland (NARTIS) trainings and other trainings such as HIV Test and Start and routine VL monitoring. The specific trainings and attendance are described in further detail under Objective 3.

Evaluation results: RHMT baseline assessment, work plan development and capacity building

Process indicator: *Capacity building plans for the RHMT and its members developed, approved by the Senior Health Administrator, and being implemented*

A capacity building plan for the RHMT, consisting of the activities described above, has been developed and implemented during each year of the program**.**

Outcome indicator: *Increased RHMT effectiveness in its stewardship and leadership functions by 70% from baseline based on the metric developed with Senior Health Administrator*

This outcome could not be assessed because the baseline assessment was not completed, nor was an effectiveness metric developed.

Other qualitative findings:

Confirming the findings of the program records review regarding the baseline assessment, no KI was aware of a baseline assessment of the RHMT carried out by ICAP.

KIs acknowledged ICAP's role in the development and implementation of regional work plans. As one explained:

> *Yes… there were work plans, [the RHMT has] work plans which ICAP have supported in the region… there is TB, there is SRH like sexual reproductive health, there is HIV, there is health promotion, there is environmental health, all these programs, ICAP is the one that was funding and supporting*

[RHMT] to come up with a work plan which as a region [they] then follow through to see if [they] are performing… if [they] are closing the gaps or not.

Qualitatively, key informants noted improvements in operations of the RHMT from the time program activities began as compared to before 2015. As one participant described, "I think ICAP has done a good job of dealing with strengthening the RHMTs…we saw such a dramatic change… you know in the beginning, it was very, very weak and then we saw the strengthening."

6.3.2 Sub-objective: Work with the RHMT in implementing a quality assured health delivery system in the region in line with the MOH Quality Management Program

Key activities for quality assurance of regional health care delivery

Support of regional performance review activities

ICAP continues to provide technical assistance to Manzini RHMT to improve its management capacity in supervising health interventions and service delivery in the region. Monthly program review meetings are now routinely being conducted at facilities with ICAP's support to strengthen quality management structures and address health system gaps that undermine quality.

During all program years, ICAP has worked with regional SID office and RHMT to conduct semiannual ReHSAR meetings. Like the national-level NaHSAR meetings described under the Objective 1 findings, these meetings were originally established by ICAP prior to this CoAg. They provide a system in which facilities are supported in setting performance targets for HIV, TB and other outcomes, assessing and presenting their results, and identifying areas for improvement through QI projects. ICAP has provided logistical and technical support for these meetings, including supporting the planning, revision of tools, collection, cleaning, analysis and presentation of data, dissemination of findings, and support of the development of corrective action plans.

Support of regional M&E systems

ICAP has strengthened M&E systems within the region by engaging regional data personnel who work together with M&E cluster coordinators to ensure that quality data are generated. ICAP capacitated the regional SID team to develop Power BI dashboards to produce visualizations of CMIS data to improve data utilization for feedback to facilities and assessment of outcomes. ICAP also trained 564 HCWs in Manzini in the use of CMIS. The scope of ICAP's role in this area was limited, however, since another IP supported the implementation of CMIS.

Infrastructure, equipment, and HR

Gaps in infrastructure, equipment, and HR at facilities in the region have been identified, and ICAP has provided support in these areas to improve quality of services. This has included provision of cervical cancer screening equipment and support in human resources through placement of lay cadre (HTS counsellors, expert clients, TB cough monitors) at facilities For details on the support provided for lay cadre, please see Objective 3 (p. 36 and p. 53).

Evaluation results: Quality assurance of regional health care delivery

Process indicator: Number of ICAP-supported facilities participating in ReHSAR increased to 100%

This target has been achieved; all 43 of the 43 ICAP-supported facilities in Manzini participate regularly in ReHSAR.

Process indicator: *Number of facilities conducting routine TB/HIV performance review and have active QI projects increased to 100%*

All 43 (100%) of ICAP-supported facilities conduct routine TB/HIV performance review. Participation in QI projects has varied over time depending on which QI projects are active. Fourteen of the 17 BMUs in FY16 (82%) participated in the TB treatment success QIC, and 13 participated in the DR-TB outcomes QIC in FY17 (both QIC initiatives are described on p. 28).

Other qualitative findings:

In interviews, facility, funder, and national- and regional-level MOH representatives all affirmed ICAP's performance in ReHSAR coordination. ReHSAR meetings were regarded by key informants as one of the strongholds of quality assurance in the region, ensuring that high-performing sites are rewarded and low-performing sites emulate best practices from the performing sites. ICAP leadership was commended for their continued presence at the meetings, which stakeholders viewed as a sign of commitment to quality improvement.

Several key informants described improvements in quality of care at facilities due to ReHSAR and regional QI activities. Some specifically noted the collaboration between ICAP and the RHMT in the process:

> *…after those key performance assessment activities, the ICAP team would come and say these are the results that we got for the region and try to find the way how [regional facilities] can improve, because ICAP is assisting the region to do its best in terms of HIV care, so yeah, we would discuss what can be done. And then [for] implementation [facilities] work in collaboration with ICAP team and the regional people.*

However, two KIs commented that the ReHSAR's original purpose as an HIV-specific meeting had at times left TB as a secondary focus. The facility representative commented, "Of late they started to include TB because TB was sort of neglected in those forums… but we still feel the integration needs to be seen more… personally I feel for your TB story to be heard in that forum you need to, you really need to push, that's my feeling." Another stakeholder commented on a need to update the ReHSAR performance indicators to match current priorities: "I think when they started the things were relevant, but if you look at… where the epidemic is, and where the priorities are, you would have expected for example the issue of TPT, which is something which we are concerned about, to be one those key sort of indicators where we would regularly sort of monitor."

SIMS visits were cited as another part of the QA processes that improved operations at facility level within the region. However, KIs expressed that there are still problems each year with data quality assurance, especially around the number of patients in care. The primary challenge in this area recently was a discrepancy in the number of individuals active on ART, which was overestimated in the national Health Management Information System when compared to the numbers on record at facilities. To address this, ICAP conducted a census for those clients active on ART to identify the accurate figure.

Regarding ICAP's support for M&E activities, one KI commented:

> *ICAP has been, has helped the region to improve on its performance, because also in terms of HR there are health information assistants in the region who have been placed by ICAP to improve the data aspect of things, and there was support from the M&E side in terms of each M&E looking at a cluster so that [it's] not one person looking at the whole region, because Manzini is so huge. So I think all those things have helped the region to sort of improve, because I don't think the regional team itself without the support would have improved so much without the ICAP support.*

However, some KIs noted that regional health workers needed more capacitation to be able to review and use health facility data themselves. One explained that, "M&E does data collection, does the data analysis with little input from the clinical people, yet we want the clinical people to lead this thing and help [with] the M&E supporting them so that the clinical people can talk to the data to say, ooh here there was a dip, here there was an increase, this is what we did…"

Objective 2 Summary

Evaluation results for objective 2 are summarized in Table 8. The baseline assessment of the RHMT was not conducted as planned, due to budget considerations and delays in the development of national policy documents on which the assessment was to be based. The lack of baseline data made assessment of progress challenging. However, ICAP did successfully develop and implement annual capacity-building plans for the RHMT. Changes in RHMT effectiveness in stewardship and leadership could not be assessed, since the metric to do so was never developed. Qualitatively, some key informants described ICAP's efforts as contributing to noticeable improvement in the Manzini RHMT's capacity to lead the implementation of quality care in the region.

Notably, all 43 ICAP-supported facilities now participate in ReHSAR meetings, which were described as important contributors in regional health care quality improvement. The number of facilities participating in QI projects has varied over time depending on the currently active project(s). ICAP's TA and logistical support for ReHSAR meetings was appreciated, though a few KIs suggested that an increased focus on TB in that forum would be helpful. All ICAP-supported facilities also conduct routine TB/HIV performance review, with the support of ICAP and the RHMT. ICAP's support of regional M&E systems was noted, though some KIs commented that capacitation of clinical staff to independently review and use their own data for monitoring and performance assessment would be helpful.

Table 8. Key evaluation indicators and results for Objective 2: Strengthen the Manzini RHMT's stewardship, ownership, and quality management of HIV/TB service delivery

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page
2.1 Provide expert assessments to identify organizational development needs of the RHMT and assist in implementing institutional capacity building work plans to strengthen the institution's ability to effectively function as stewards of health services in the region	Capacity building plans for the RHMT and its members developed, approved by the Senior Health Administrator, and being implemented	Key informant interviews Program documents: •Objective 2 work plans •APRs	Achieved		31
	Increased RHMT effectiveness in its stewardship and leadership functions by 70% from baseline based on the metric developed with Senior Health Administrator	Key informant interviews Program documents: • PEPFAR/world bank RHMT assessment draft •APRs	Unable to assess	Metric of effectiveness was not developed	31
2.2 Work with the RHMT in implementing a quality assured health delivery system in the	Number of ICAP-supported facilities participating in ReHSAR increased to 100%	Key informant interviews Program documents: •ReHSAR Reports	Achieved		32

region in line with the MOH Quality Management Program.	Number of facilities conducting routine TB/HIV performance review and have active QI projects increased to 100%	Key informant interviews Program documents: •ReHSAR Reports •QI project documents	Partially achieved	100% of facilities conduct routine TB/HIV performance review. The number with active QI projects varies over time.	33

6.4 Objective 3

Under Objective 3, the program aimed to "Improve coverage and quality of PIHTC, PMTCT, TB, TB/HIV, pre-ART HIV care, pediatric ART, and adult ART, in line with 2013 WHO guidelines, at public, mission, industrial, and private health care facilities and in community settings in Manzini." The specifics of this objective were adjusted over time in accordance with updated WHO guidelines and emerging regional and national priorities. In particular, certain sub-objectives were prioritized in order to address the 95-95-95 goals for HIV, specifically: 95% of people living with HIV (PLHIV) have been tested and know their status; 95% of people who know their status are receiving treatment; and 95% of those on treatment have a suppressed viral load[13].

HIV Testing Services (HTS)

6.4.1 Sub-objective: Expand access to PIHTC at all health facilities (public, mission, private) in the Manzini region in line with current guidelines

Key HTS activities

Under this sub-objective, ICAP supported expanded access to HTS in accordance with MOH priorities. From FY16-18, MOH focused on maximizing testing volume and testing all patients for HIV regardless of individual symptoms or risk factors. For FY19, priorities shifted in response to the evolving epidemic. By that time, testing rates were relatively high in the overall population, but lagged among certain subgroups, including men and adolescents. Consequently, MOH and program efforts were refocused towards targeted testing of those at greatest risk, with an emphasis on efficient case finding and maximizing the testing yield (the number testing positive over the total number tested). These changing priorities were reflected in program activities, such as index case testing and Surge activities, and in the PEPFAR annual HTS targets.

TA to develop and distribute HTS SOPs and related tools and job aids

ICAP provided TA to the MOH to help develop SOPs for HTS and distribute the new SOPs to facilities. In FY18, the program printed and distributed 500 copies of the SOPs, as well as 200 registers, 200 monthly summary reporting tools and 300 job aids (flowcharts for retesting) to facilities. ICAP has also contributed to the development of tools and SOPs for index case testing.

Training, mentoring, and supportive supervision

From the start of the program to Q3 of FY19, ICAP trained 1,221 HCWs in Manzini region in HTS, including PIHTC SOPs, index case testing and self-testing. ICAP also provided regular mentoring and supportive supervision to HCWs at all PEPFAR-supported facilities in the Manzini region, which included support for:

- Conducting PIHTC at all entry points including the TB clinic, antenatal clinics, labor and delivery, child welfare clinics, inpatient wards, the outpatient department (OPD), and voluntary counseling and testing (VCT) standalone clinics
- Implementing facilitated linkages of clients testing positive from all points of service
- Monitoring facility HTS cascades (including the number receiving HTS, the percent of those testing positive who initiate ART, and subsequent rates of retention in care) monthly and identifying and addressing leakages
- Expanding index-case testing among clients in PMTCT and HIV treatment settings to include their sexual partners and children
- Implementing HIV testing for verification before ART initiation

HR support

Each year, the program has funded lay HTS counselors and expert clients who support HIV testing and linkage to care at PEPFAR-supported facilities in Manzini as indicated in Table 9 below.

Table 9. HR support Manzini region

	FY15	FY16	FY17	FY18	FTY19
Type of HR					
HTS Counselors	12	22	22	27	43
Expert clients	44	56	66	66	80

Evaluation results: HTS

Process Indicator: 100% of 43 PEPFAR-supported facilities have PIHTC SOPs in place

This benchmark has been met; all 43 facilities have PIHTC SOPs in place.

KIs reported being satisfied with the TA provided by the program towards implementation of the HTS SOPs. No participants identified issues or challenges around these activities.

Outcome Indicator: 100% of PEPFAR supported facilities provide quality assured testing and associated counseling to at least 80% of clients eligible for HTC

The proportion of eligible clients at each facility who receive HTS could not be assessed at this time, since tracking of the number of eligible clients has not yet been rolled out at all facilities.

Pilot tracking data from RFM Hospital in January-May of FY19, prior to Surge activities, indicated low rates of testing coverage for eligible (female 15-39 years old, male 25-44, presumptive TB, no prior HIV tests, or tested negative within the last 12) clients (38%-67%), but in the four months following Surge activities (August FY19 through November FY20), testing coverage at RFM has been 98-100% each month.

Outcome Indicator: Total number of clients tested annually at ICAP-supported facilities and percent testing positive, in relation to PEPFAR targets

From FY16 through FY18 when testing volume was prioritized, ICAP-supported facilities provided testing for over 100,000 clients annually (Figure 1) and exceeded PEPFAR testing targets by at least 40% each year. In FY19, the testing volume target was reduced as priorities shifted to targeted testing and efficient case-finding. There was a 10% reduction in testing volume from FY18 to FY19 (see Table 10) though the total number tested in FY19 reached 269% of the reduced annual target. Because the testing target in FY19 represented a sharp reduction in volume, PEPFAR has also assessed this outcome by combining the targets and outcome numbers for FY18 and FY19. Over these two years, ICAP tested 182% of the combined

annual testing targets. Despite this, the number of individuals diagnosed with HIV and the percent yield of positive results for FY19 were also lower than in previous years, despite the use of targeted testing strategies. This continues a trend of reduced testing yield since FY17.

In addition to traditional HTC, ICAP-supported facilities also distributed 2,400 HIV self-testing kits in FY18 and 1,375 kits in FY19.

Figure 1. HTS clinical cascade at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19
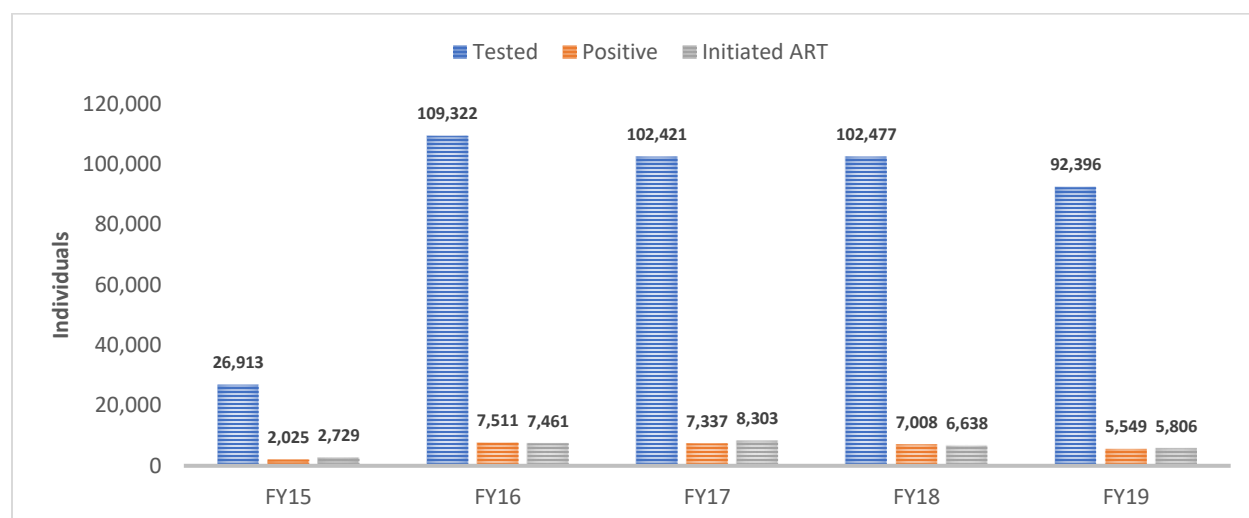
Based on PEPFAR MER indicators HTS_TST and TX_NEW. Data source: ISAD.

Table 10. Number of patients receiving HTS, testing positive, and percent testing yield at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	# Patients who received HIV test results*			# Patients testing positive*			% positive
	Target	Result	% of target achieved	Target	Result	% of target achieved	
FY15	N/A**	26,913	N/A**	N/A**	2,025	N/A**	7.5%
FY16	68,755	109,322	159%	8387	7,511	90%	6.9%
FY17	24,350	102,421	421%	1775	7,337	413%	7.2%
FY18	72,715	102,477	141%	7,355	7,008	95%	6.8%
FY19	34,407	92,397	269%	3,230	5,549	172%	6.0%
FY18 & FY19*	107,122	194,874	182%	10,585	12,557	119%	6.4%

*Based on MER indicator HTS_TST. Data source: ISAD.

**Targets were not set for FY15

***Combined targets and results for FY18 and FY19 are being used by PEPFAR to assess current progress due to the substantial reduction in the FY19 targets from the prior year.

Outcome indicator: Index case testing

Index case testing numbers have increased annually (see Table 11). However, just 6% of all positive test results in FY19 were the result of index testing; this is well below the program target of 36%, due in part to a sharp decline in the yield of positive results from index testing in FY19.

Figure 2 shows the index testing cascade. The number of index contacts tested (n=4,136) exceeded the program target of 3,032. However, it represents less than a third of all the index contacts that were identified (n=14,571); the program target for the percent of identified cases receiving testing in FY19 was 80%.

Table 11. Index case testing yield at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY19

Reporting period	# Patients tested via index*			Total # patients tested**			% of all positive tests from index testing
	Tested	Positive	% Positive	Tested	Positive	% Positive	
FY17	2,615	599	23%	102,421	7,337	7.2%	8%
FY18	3,751	830	22%	102,477	7,008	6.8%	12%
FY19	4,136	329	8%	92,397	5,549	6.0%	6%

*Based on MER indicator HTS_index. Data source: INSIGHT.
**Based on MER indicator HTS_TST. Data source: ISAD.

Figure 2. Index case testing cascade at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY19
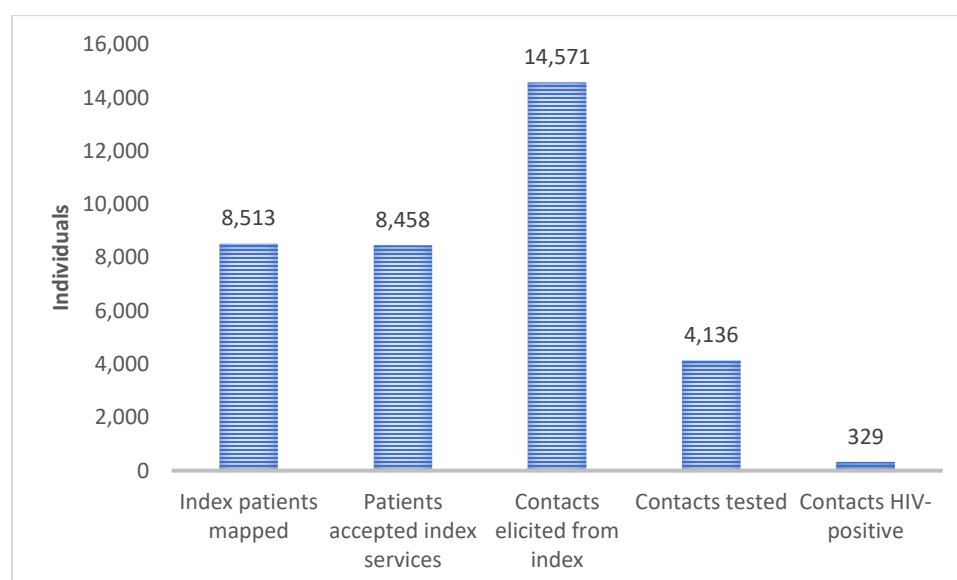
Based on MER indicator HTS_INDEX and HTS_TST. Data source: INSIGHT.

Qualitative findings also identified index case testing as a current challenge. Key informants described the implementation of index testing in Manzini as occurring slowly, resulting in lower than desired index testing volume to date. One noted that "…it's been something that [CDC has] been pushing for a long time," yet the "commitment from [ICAP] to make sure that index testing was instituted and started happening took very long." KIs also noted other challenges related to index testing that were not specific to the program or region, but that will require attention in the final year of the grant. The first is a need for better communication with the community testing organizations that refer those who test positive to ICAP-supported health care facilities to avoid duplication of effort in eliciting and testing partners. The second is that, as described above, the proportion of identified contacts being tested remains below the target of 80%. "That probably is the biggest gap… part of it may be the searching process. How is it being

done, are you getting enough information for you to actually be able to find the person? So that part is still being worked on."

Several facility representatives and a national-level MOH representative did describe promising efforts by ICAP around index testing, including supporting the distribution of self-testing kits, and the development and piloting of a job aid for eliciting contacts. One concluded, "[Index testing] is something that I think we are investing all our energies on… I think we are still not yet there, but we are going to get there."

Outcome Indicator: *Proportion of HCWs competent in HTS services*

Survey results indicated that 84% of all HCWs were competent in provision of HTS services, as measured by the survey knowledge questions (Table 12). Although the proportion achieving competency differed somewhat by clinical role, these differences were not statistically significant. Consistent with the competency scores, self-efficacy to conduct rapid HIV testing and provide pre- and post-test counseling were relatively high among all HCWs. On the 5-point scale with a score of 5 meaning "extremely confident," mean HIV testing score was 4.2 (SD: 1.0) for rapid testing and 4.3 (0.7) for counseling.

Table 12. Weighted proportion of HCWs achieving competency in HTS services and mean self-efficacy score in HTS service provision by clinical role at selected ICAP-supported healthcare facilities (n=23) in Manzini Region, Eswatini, FY19

Clinical role	Proportion of HCWs achieving competency* in HTS services Weighted percent	Mean self-efficacy score in HTS service provision**		
		Conduct rapid HIV test Weighted mean (SD)	Collect specimens for DNA PCR Weighted mean (SD)	Provide pre- and post-test counselling Weighted mean (SD)
Doctor (n=6)	100%	3.9 (1.4)	3.7 (1.1)	3.7 (1.0)
Nurse (n=131)	87%	4.5 (0.6)	3.9 (1.0)	4.4 (0.7)
Nursing assistant (n=27)	69%	4.5 (0.5)	3.9 (1.0)	4.3 (0.5)
Lay cadre (n=90)	***	3.6 (1.3)	2.8 (1.4)	4.2 (0.8)
Total	**84%** **(n=164)**	**4.2 (1.0)** **(n=224)**	**3.6 (1.3)** **(n=212)**	**4.3 (0.7)** **(n=243)**

*Based on a combined knowledge score of at least 66% on HTS survey questions
**On a Likert scale with 1="Not at all confident" and 5="Extremely confident"
***Lay cadres were not surveyed on clinical competencies

Other qualitative findings:

Key informants generally commented positively on the program's performance in the area of PIHTC.

Key informants from the funder and MOH noted that regional testing rates for PIHTC were already high at the start of the program, so room for improvement was limited.

Health facility representatives described ICAP's support of HTS personnel and expert clients as particularly helpful in improving facility testing operations (both staff workloads and patient wait times) and testing rates. In KIIs, three of the five facility representatives specifically mentioned HR support for HTS counselors and Expert Clients as an important component of ICAP's contribution towards the 95% goal. According to one respondent, "ICAP has helped us in terms of… HTS counselors who are separate from the nurses, it really, when it was implemented it took us far because now most of the people who come to the facility, they leave this place knowing their status."

HTS Summary

Table 13 summarizes the findings for this sub-objective based on a selection of key indicators that were pre-specified in the evaluation framework (Appendix B). Testing coverage could not be assessed across all facilities at this time, since tracking of the number of testing-eligible clients is in the process of being implemented at facilities in early FY20. The program has surpassed its annual targets for the number of individuals tested each year from FY16-FY19. Despite efforts to conduct more targeted testing in FY19, the percent yield of positive test results actually declined from FY18, though ICAP tested 269% of the annual testing target in FY19 (and 182% of the combined testing targets for FY18 and FY19 when assessed together). However, it should be noted that the number of individuals testing positive has also exceeded the annual target, indicating that even though ICAP may be over-testing, they are still identifying more than the target number of people testing positive. Still, this indicates that optimization of the HTS process could be improved.

Index case testing was identified as a key challenge requiring improvement: Less than a third of identified contact persons received testing in FY19, well below the target of 80%. Additionally, the proportion of all positive HIV tests resulting from index case testing (6%) failed to reach the FY19 target (36%). Key informants also identified index testing as a remaining gap requiring additional efforts.

KII respondents spoke positively of the program's support for PIHTC services and HTS, and noted the positive impact of ICAP-supported HTS counselors and expert clients on testing coverage. Eighty-four percent of surveyed HCWs were competent in HTS, and HCW self-efficacy to provide HTS was relatively high.

Table 13. Key evaluation indicators and results for HTS

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.1 Expand access to PIHTC at all health facilities (public, mission, private) in primary region in line with current guidelines	100% of PEPFAR supported facilities provide quality assured testing and associated counseling to at least 80% of clients eligible for HTC	Program data: APRs/ISAD • MER indicator HTS_TST	Unable to assess	Data on number of eligible clients not available	36
	Proportion of PEPFAR supported facilities with PIHTC SOP in place increased to 100%	Program data: ISAD	Achieved		36

ART Initiation

6.4.2 Sub-objective: Expand ART coverage and increase timely ART initiation and retention on ART

Key ART Activities

TA to MOH to update guidelines and develop job aids

ICAP provided TA to ENAP/SNAP to develop national guidelines and implementation strategies, including the national Test and Start implementation strategy in FY16 and the updated ART guidelines in FY18. ICAP

also gave input on job aids for the updated treatment guidelines. These contributions were provided by ICAP in a supporting role to the lead IP, at the request of ENAP/SNAP.

Accreditation of ART-initiating and ART-providing facilities

ICAP has provided TA to support accreditation of clinics in Manzini by ENAP/SNAP to provide comprehensive HIV services, including ART initiation. ICAP contributed supplemental funding for the renovation/expansion of one clinic, supported staff at facilities, and facilitated the accreditation process by engaging ENAP/SNAP. In FY15, two facilities received accreditation to transition from "ART refilling only" to "ART initiation" facilities. In FY17, one more clinic was accredited, and in FY18, an additional four clinics were accredited as ART sites, bringing the total number of ART-initiating facilities to 40.

Training, mentoring, and supportive supervision

ICAP supported facilities in implementation of all updates to national ART guidelines during the program period through TA, training and mentoring. This has included contributing to the development of in-service curricula, such as the Test and Start training curriculum for HCWs developed in FY16 (ICAP supported the lead IP on this work, at the request of ENAP/SNAP). ICAP also assisted in the development, printing, and distribution of job aids. A total of 2,126 HCWs have received training on ART guidelines, including:

- 652 HCWs trained on Test and Start/ART for All (FY16-FY17)
- 848 HCWs trained on the updated 2018 guidelines (FY18-19)
- 137 HCWs trained on the amended 2018 guidelines (FY19)
- 295 nurses trained on NARTIS (FY16-19)

Support to facilities has also focused on adherence and retention in care and 3,100 HCWs were trained on various aspects of adherence, psychosocial support and patient follow-up. The program provides training and funding for facilities to run 18 "teen clubs" that offer treatment, psychosocial and adherence support for adolescents. Together, these teen clubs serve 38% (1,128/2,942) of adolescents on ART at ICAP-supported facilities as of FY19.

HR support

The program has funded between 12 and 43 lay HTS counselors and 44 to 80 expert clients at facilities in Manzini each year from FY15-FY19 (see Table 9); their work includes linkage to care and retention activities. The number of supported staff has increased each year of the program. During FY19, 25 lay counselors were hired to serve as linkage case managers at high-volume facilities, bringing the total number of supported lay counselors to 43. Additionally, 15 expert clients were deployed to high-volume facilities during FY19, increasing the total number supported to 80.

ART QI projects

ICAP planned and implemented a QI project in partnership with the Manzini RHMT during FY17 in response to low rates of ART initiation among infants with HIV from July to December 2016 (28%, 27/98). As part of the QI plan, ICAP provided TA, including development of a concept note to improve ART initiation among children living with HIV, identification of facilities with low rates of ART initiation for children, sensitization of HCWs at facilities, and training of nurses on ART initiation for children. ICAP also facilitated real-time monitoring of lab results and supported data verification activities. Following these activities, as reported in APR17, 94% (30/32) of newly diagnosed infants were initiated on ART from January to June 2017.

Evaluation results: ART

Outcome Indicator: *Proportion of patients diagnosed with HIV at health facilities successfully linked to care increased to 90%*

Using a proxy measure for linkage to care, the percent of patients linked has appeared to surpass the evaluation target of 90% in every year of the program to date (Table 14). After the program evaluation targets were set in early 2018, the national target for linkage to care was increased to 95%[13] . The proxy linkage number has also met or exceeded this more ambitious target each year, including FY19. The best available proxy measure for linkage to care was the number of patients initiated on ART (TX_NEW), divided by the number testing positive for HIV (HTS_TST_POS). A major limitation of this proxy measure is that individuals testing positive at community sites (rather than health facilities) are included in the numerator for this measure but not the denominator, producing an overestimate of linkage to care. Additionally, certain episodic testing/ART initiatives, such as Test and Start in FY16 and Surge activities in FY19, may have contributed to overestimations of the proxy measure during those years. Thus, these results must be interpreted with caution.

Linkage to care has been assessed within facility cohorts at selected timepoints. Most recently, the overall combined intra-facility linkage to care rate for FY19Q4 was 69% (898 patients initiated on ART at facility/1310 newly testing positive at facility). However, this number does not reflect patients who were linked to care at facilities other than their testing location.

Table 14. Number of patients testing positive, number initiating on ART, and percent linked to care at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	# Patients testing positive*			# Patients initiated on ART**			# Patients initiated on ART / # Patients testing positive
	Target	Result	% of target achieved	Target	Result	% of target achieved	
FY15	N/A***	2,025	N/A***	2,800	2,729	97%	135%
FY16	8,387	7,511	90%	7,990	7,461	96%	99%
FY17	1,775	7,337	413%	6,926	8,303	120%	113%
FY18	7,355	7,008	95%	9,687	6,638	69%	95%
FY19	3,230	5,549	172%	5,520	5,806	105%	105%
All years	--	29,430	--	--	30,937	--	105%

*Based on PEPFAR MER indicator HTS_TST_POS. Data source: ISAD.

** Based on PEPFAR MER indicatorTX_NEW. Data source: ISAD.

***Target was not set for FY15

Outcome Indicator: *Proportion of PEPFAR-supported facilities initiating ART for at least 90% of eligible adults/adolescents and 90% of eligible children increased to 95% of PEPFAR-supported facilities*

The number of facilities meeting this benchmark fell short of the 95% target for both adults/adolescents and children. Thirty-two of the 40 facilities (80%) had reached or exceeded the target of initiating 90% of eligible adult and adolescent patients. For children, the number was lower with only 12 of the 40 facilities (30%) meeting or surpassing the 90% initiation benchmark.

To measure achievement on this indicator, the number of patients initiated on ART (TX_NEW) over the number testing positive for HIV (HTS_TST_POS) was calculated for each ICAP-supported ART-initiating facility in Manzini (n=40) using FY19 Q1-Q3 data. Note that this is the same proportion used as a proxy measure for linkage to care above, but in this case it is applied at the facility level.

Outcome Indicator: *Proportion of PEPFAR supported facilities with 90% retention in care and treatment at 36 months for each demographic group of adults, adolescents, and children has increased to 95%*

Retention in care and treatment was assessed using a proxy measure: MER indicator TX_RET, which measures retention at 12 months of treatment instead of 36 months. At the facility level, 26 of 40 facilities (65%) had achieved 90% or greater retention in care for adults and adolescents as of APR18. Twenty-one of the 40 (53%) had achieved 90% or greater retention of infants on treatment. These 12-month retention rates are higher than the rates that would be expected at 36 months retention. Data for TX_RET are available only through FY18 since this indicator was discontinued by PEPFAR in FY19[6].

Outcome Indicator: *Initiation and retention on ART*

The number of patients newly initiating ART each year is shown in Table 14. This number has approached or exceeded program targets (96-120%) each year except FY18 (69%). Table 15 provides further detail on aggregate patient results for retention on ART across all ART-providing ICAP-supported facilities using MER indicator TX_RET. For FY18, the most recent year for which these data are available, 88% of patients were retained on treatment at 12 months. This represents 97% of the target retention percentage for that year.

Table 15. Number and percent of patients retained on ART at 12 months at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY18

Reporting period	# initiating ART in the 12 months before the reporting period*			# still on treatment at 12 months*			% retention on ART	
	Target	Result	% of target achieved	Target	Result	% of target achieved	Target	Result
FY15	N/A**	6,081	N/A**	N/A**	5,506	N/A**	N/A**	92%
FY16	4,797	6,801	142%	4,266	6,102	143%	89%	90%
FY17	7,990	8,321	104%	7,272	7,232	99%	91%	87%
FY18	10,302	9,919	96%	9,381	8,748	93%	91%	88%

*Based on PEPFAR MER indicator TX_RET, which was discontinued as a MER indicator as of the start of FY19[9]. Data source: INSIGHT.

**Targets were not set for FY15.

Beginning in FY19, TX_RET was retired as an indicator; new MER indicator TX_ML provided information regarding retention in care[9]. Based on TX_ML data, at the end of FY19, 376 patients on ART had no clinical contact since their last expected contact; this represented less than 1% of the 62,006 patients currently on ART at that time. Furthermore, these 376 likely included some patients who died or transferred care to another facility, suggesting a retention rate above 99%.

Additionally, the number of patients on ART has continuously exceeded annual targets by at least 8% each year since FY15, as shown in Table 16, though these high percentages are due in part to the acquisition of new ICAP facilities and to increased treatment activity under Test and Start.

Table 16. Number and percent of patients currently on ART at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	Patients currently on ART*		
	Target	Result	% of target achieved
FY15	40,172	40,094	100%
FY16	41,472	50,652	122%
FY17	46,565	50,551	108%
FY18	52,131	58,507	112%
FY19**	57,388	62,006	108%

*Based on PEPFAR MER indicator TX_CURR. This indicator is measured as a quarterly snapshot and is not cumulative across quarters. The results reflect Q4 for each respective year. Data source: INSIGHT/DATIM.
**Beginning in FY19, the definition of TX_CURR was modified to classify all patients who had not received ART medications within 4 weeks of their last drug pickup as lost to follow up. This may result in lower estimates of "current" ART patients in FY19 compared to earlier years[9].

HIV testing and retention in care by age and sex are shown in Tables 17 and 18. Rates of retention among those initiating treatment are similar across age and sex. The number of women testing for HIV is approximately double that of the men, reflecting the higher HIV incidence among women nationally[1]. This difference then carries throughout the HTS cascade, resulting in fewer men receiving ART.

KIs highlighted certain subgroups as a remaining gap in ART coverage outcomes, based on national and regional data: "So the coverage now… for Manzini, we are getting there, the issue now is there are age groups which will be lagging. So the emphasis, how do you find those ones which are lagging, especially look at men, I think it is an issue, you also look at the young people…"

Initiating and maintaining children with HIV on ART presents continued difficulties. As one KI commented, "…adherence to treatment in pediatrics, it involves a lot of dynamics, social dynamics, parents, guardians and so forth, so that one is what the country really needs to work strongly towards."

Table 17. Number and percent of patients testing HIV-positive, initiating ART and retained on ART at 12 months, by sex, at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15-18

Reporting period	# patients who received HIV test results*		# patients testing positive*		# initiating ART in the 12 months before the reporting period**		# still on treatment at 12 months**		% retention on ART	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
FY15	15,966	7,728	1,236	738	7,883	4,434	7,258	4,018	92%	91%
FY16	61,490	29,750	4,614	2,440	4,767	2,034	4,286	1,816	90%	89%
FY17	41,838	24,143	3,606	2,286	5,536	2,498	4,820	2,171	87%	87%
FY18	60,182	25,697	4,510	2,353	6,470	3,175	5,706	2,797	88%	88%
FY19	61,123	31,273	3,568	1,981	***	***	***	***	***	***

*Based on PEPFAR MER indicator HTS_TST. Data source: INSIGHT.
**Based on PEPFAR MER indicator TX_RET. Data source: INSIGHT.
***TX_RET was discontinued as a MER indicator as of the start of FY19[14].

Table 18. Number and percent of patients testing HIV-positive, initiating ART and retained on ART at 12 months, by age, at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15-18

Report-ing period	# patients who received HIV test results*		# patients testing positive*		# initiating ART in the 12 months before the reporting period**		# still on treatment at 12 months**		% retention on ART	
	Children (<15 years)	Adults (15+)	Children (<15 years)	Adults (15+)	Children (<15 years)	Adults (15+)	Children (<15 years)	Adults (15+)	Children (<15 years)	Adults (15+)
FY15	4,540	22,373	91	1,932	727	11,590	671	10,605	92%	92%
FY16	21,447	84,792	390	6,905	362	6,439	341	5,761	94%	89%
FY17	8,500	67,732	235	6,305	434	7,887	377	6,855	87%	87%
FY18	17,729	77,277	182	6,707	439	9,480	405	8,343	92%	88%
FY19	12,332	80,064	217	5,332	***	***	***	***	***	***

*Based on PEPFAR MER indicators HTS_TST. Data source: INSIGHT.

** Based on PEPFAR MER indicator TX_RET. Data source: INSIGHT.

***TX_RET was discontinued as a MER indicator as of the start of FY19[14].

Outcome Indicator: *Proportion of HCWs competent in ART services for adults and pediatrics*

Survey participant scores reflected greater competency in adult ART (74% competent overall) than in pediatric ART (54%) among all types of HCWs (Table 19). Differences in score by clinical role were not statistically significant.

Table 19. Weighted proportion of HCWs achieving competency in adult and pediatric ART services by clinical role at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Clinical role	Proportion of HCWs achieving competency* in adult ART services Weighted percent	Proportion of HCWs achieving competency* in pediatric ART services Weighted percent
Doctor (n=6)	100%	57%
Nurse (n=131)	73%	53%
Nursing assistant (n=27)	72%	61%
Total (n=164)	**74%**	**54%**

*Based on a combined knowledge score of at least 66% in the respective category of survey question

Other qualitative findings:

KIs described the scale-up of ART coverage in the region as a key area of program success. One commented that "ART coverage in Manzini, I think the improvements which have happened in the past 3, 4 years, I think ICAP has contributed;" while another called it a "major achievement."

Key informant participants acknowledged ICAP's support in the development of the 2018 national ART guidelines: "They [ICAP] were very helpful when we developed the 2018 guidelines, we developed the guidelines as an in-country team where ICAP was a stakeholder. They played a very key role in also bringing external reviewers… who reviewed the ART guidelines and we really appreciated that." ICAP's support for the implementation of updated treatment guidelines was also noted:

> I think ICAP has been very successful at, in a timely way, transitioning to Test and Start, and now transitioning to TLD... what's really important is that when you make these transitions, that you

don't wait for too long… and that there's training and other things in place so that those transitions can happen in a timely way.

KII participants representing health care facilities, MOH and the funder reported being generally satisfied with the support the program has provided to facilities in terms of staffing, training and mentoring in the area of ART services, and described these activities as contributing to ART coverage and retention in care. According to KIs, expert clients have played a key role in retention and linkage activities. According to one stakeholder, they have been "especially important, we found, in linking patients to care and also making sure that they are not lost to follow-up." Another respondent commented, "They [ICAP] are supporting so much on the issue of the adherence, the follow ups for those that are already on treatment so that is why… when we are looking at our performance, I think Manzini was performing very well."

Two key challenges were described by respondents in regard to training activities: Staff turnover, and the private facilities in Manzini. These challenges were raised with respect to all training at facilities, but especially NARTIS and ART guidelines training. Although PEPFAR generally does not support private facilities, national-level MOH representative noted that ICAP had, at the request of the regional MOH, been able to provide some training to HCWs at private facilities in the region: "Manzini has got a lot of private facilities so they [ICAP] have helped in terms of us capacitating the private facilities, which will help in the expansion of the coverage." However, another KI explained, "We did get into that discussion with [ICAP] to say at least support [the private facilities] with the mentoring, support them, but of course it is not their [ICAP's] priority so you can just tell that, [the private facilities] can never be the same as where they [ICAP] are. Yet it does affect the regional outcome."

ART Summary

As Eswatini works towards achieving 95% treatment coverage of al PLHIV, and Manzini region achieved 96% ART coverage as of December 2019, ICAP's contributions towards ART coverage and the rollout of updated treatment guidelines were identified as key strengths of the program. The percentage of patients testing positive who initiate ART has been measured at greater than 95% each year since FY15, though the proxy measure used provides an overestimate of this outcome. The proportion of facilities that initiate and retain 90% of eligible clients on ART need improvement, especially for pediatric populations. KIs also noted remaining gaps among sub-populations with lower coverage rates, particularly men, infants/children and adolescents, though these patterns did not emerge clearly in program data. HCW survey results indicate that HCW knowledge on ART for pediatric patients is limited, with just over half of HCWs achieving scores reflecting competency in pediatric ART services.

Table 20. Key evaluation indicators and results for ART

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.2 Expand ART coverage, increase timely ART initiation and retention on	Proportion of patients diagnosed with HIV successfully linked to care increased to 90%	Program data: APRs/ISAD •MER indicators HTS_TST and TX_NEW	Achieved (proxy measure)		42

ART, and roll out VL monitoring	Proportion of PEPFAR supported facilities initiating at least 90% of adults (and adolescents) and 90% of children who are eligible for ART has increased to 95%	Program data: ISAD •MER indicators TX_NEW and HTS_TST_POS	Partially achieved	Adults & adolescents: **80%** of facilities; Children: **30%** of facilities	42
	Proportion of PEPFAR supported facilities with 90% retention in care and treatment at 36 months for each demographic group of adults, adolescents, and children has increased to 95%	Program data: ISAD •MER indicator TX_RET	Partially achieved (proxy measure)	Adults & adolescents: **67%** of facilities; Children: **54%** of facilities	43

Viral suppression

6.4.3 Sub-objective: Roll out VL monitoring

Key VL Activities

The program has supported VL activities as the guidelines have shifted from targeted VL monitoring, to routine VL monitoring for all PLHIV. MOH began the rollout of routine VL monitoring in FY17.

It should be noted that ICAP has simultaneously contributed to the laboratory-specific aspects of VL monitoring under a separate CoAg supporting EHLS/SHLS. However, only VL activities supported under the present CoAg will be evaluated in this report.

TA and logistical assistance to ENAP/SNAP and regional MOH

The program supported MOH and health facilities in the clinical implementation of routine VL monitoring.

In FY16, ICAP assisted ENAP/SNAP to carry out a rapid assessment of facility readiness for VL monitoring and to produce a report that was shared with CDC, ENAP/SNAP and EHLS/SHLS. The program also developed clinical SOPs for viral load testing, receipt of results and subsequent clinical interventions. To support the implementation of routine VL monitoring in FY17, ICAP developed a curriculum to train HCWs on VL routine testing procedures and interpretation of results, and also developed job aids for the region that were adapted by MOH for use at the national level.

Training, mentoring and supportive supervision

In FY17, ICAP conducted on-site trainings for providers from all ICAP-supported facilities in Manzini on routine VL monitoring, as well as additional on-site training for 9 health facilities on how to use the high viral load register to generate VL cascades. As of July 2019, the program had trained a total of 837 HCWs on VL monitoring and 685 on stepped up adherence counseling (SUAC). ICAP also printed and distributed training materials and job aids to all supported facilities, including a SUAC toolkit.

ICAP mentorship to HCWs has focused on the following areas related to VL monitoring and viral suppression during FY17-FY19:

- Implementation of SUAC for individuals with unsuppressed VL.
- Implementation of peer-led adherence support for adolescents with unsuppressed VL.
- Identification of children and adolescents failing first- and second-line ART regimens and switching them onto optimized second- and third-line regimens, respectively.

As previously described (in section 6.4.2) the program also supports 18 teen clubs in Manzini, where adolescents receive tailored care including VL monitoring. The program continues to provide ongoing TA and mentorship to multi-disciplinary teams at supported facilities to monitor and review the VL cascade for adolescents within and outside the teen clubs.

During FY19, ICAP provided TA and mentoring to support the use of dried blood spot (DBS) testing for VL monitoring. DBS testing may allow for increased VL monitoring among children and adolescents, since it facilitates the process of taking and transporting blood samples for testing, and allows samples to be taken in community or other non-laboratory settings.

Evaluation results: VL

Outcome Indicator: *Viral load testing coverage*

Viral load testing coverage at PEPFAR-supported facilities has increased continuously over the program period, from a low point of 28% in FY16 to reach 82% in FY19 (see Table 21). The number of patients receiving VL testing has fallen somewhat short of the PEPFAR targets in previous years, ranging from 73% of the target in FY17 to 90% in FY18 and 85% in FY19 (Table 21).

Table 21. Viral load testing coverage among patients on ART at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY16 – FY19

Reporting period	Patients currently on ART*			# of ART patients with documented VL result in the past 12 months**			Viral load testing coverage (%)
	Target	Result	% of target achieved	Target	Result	% of target achieved	Result
FY16	41,472	44,708	108%	N/A[a]	12,450[b]	N/A[a]	28%
FY17	46,565	52,204	112%	36,294	26,335	73%	50%
FY18	52,131	58,574	112%	45,273	40,811	90%	70%
FY19	57,388	57,899[c]	101%	55,783	47,197	85%	82%

*Based on PEPFAR MER indicator TX_CURR. This indicator is measured as a quarterly snapshot and is not cumulative across quarters. The results reflect Q2 for each respective year, 2 quarters (6 months) prior to the numerator measure, as required for the calculation of viral load testing coverage. Data source: ISAD.

**Based on PEPFAR MER indicator TX_PVLS. This indicator is measured as a quarterly snapshot and is not cumulative across quarters. The results reflect Q4 for each respective year. Data source: ISAD.

[a] No targets were set for this indicator in FY15 or FY16, and no data were collected in FY15.

[b] This result for FY16 reflect older MER indicators, TX_VIRAL and TX_UNDETECT, which do not correspond exactly to current indicator TX_PVLS.

[c] Beginning in FY19, the definition of TX_CURR was modified to classify all patients who had not received ART medications within 4 weeks of their last drug pickup as lost to follow up. This may result in lower estimates of "current" ART patients in FY19 compared to earlier years[9].

Representatives of the funder, facilities, and EHLS all acknowledged that although progress had been made, VL monitoring should remain an area of focus for the program. One key informant suggested that continued weekly data review and more frequent task force meetings would help maintain the momentum on viral load progress.

Coverage of viral load monitoring was noted as a challenge by one KI. "ICAP had the lowest viral load coverage of all the regions and that is something… we expect them to improve… if you have suppression but your coverage is not where you should be, it's still not where we wanted to be."

Outcome Indicator: *90% of people on ART have viral suppression at 36 months of treatment*

The program currently captures data on viral suppression "within the past 12 months," based on MER indicator TX_PVLS, and not specifically at 36 months of treatment. Therefore, this indicator was assessed using viral suppression within the past 12 months.

Of those on ART with a documented viral load in the past 12 months, 97% were virally suppressed as of FY19 Q4. This exceeds the original 90% benchmark as well as the updated 95% target of the "third 95." The program has exceeded its targets for the percent of ART patients virally suppressed each year from FY16-19 (see Table 22).

Overall rates of viral suppression were seen by many KIs as another area of achievement for ICAP. When asked about key program successes, one facility representative commented, "What stands out first, in terms of our performance, is the issue of viral suppression, that our patients are now suppressed and they [ICAP] have really helped us achieve this."

Although overall rates of viral suppression have been relatively high, the same is not true across all age groups. As a representative of the funder put it, "Suppression [now]… it's about the age groups, so adolescents are not suppressed, young adults are not suppressed, in all regions." KIs acknowledged that viral suppression among these groups is a challenge nationally and globally, and is not specific to ICAP or to the region. One interviewee recommended "action ASAP" to assess the age categories of the DBS viral load tests completed to date, to ensure that they are reaching the younger ages as intended.

Table 22. Viral suppression among patients with a documented viral load in the past 12 months at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	# of ART patients with documented VL result in the past 12 months*			# with suppressed VL (<1,000 copies/ml) at most recent VL test in past 12 months*			% suppressed		
	Target	Result	% of target achieved	Target	Result	% of target achieved	Target	Result	% of target achieved
FY16	N/A***	12,450**	N/A***	N/A***	12,693**	N/A***	90%**	102%**	113%
FY17	36,294	26,335	73%	26,495	24,323	92%	73%	92%	126%
FY18	45,273	42,681	94%	41,160	39,954	97%	90%	94%	104%
FY19	55,783	47,197	85%	N/A***	45,647	N/A***	95%	97%	100%

*Based on PEPFAR MER indicator TX_PVLS. This indicator is measured as a quarterly snapshot and is not cumulative across quarters. The results reflect Q4 for each respective year. Data source: ISAD/DATIM.

**The results for FY16 reflect older MER indicators, TX_VIRAL and TX_UNDETECT, which do not correspond exactly to current indicator TX_PVLS. Data from FY15 were not available.

***Targets were not provided by PEPFAR for this reporting period.

Outcome Indicator: *Proportion of HCWs competent in adherence counseling services*

HCWs generally scored well on adherence counseling knowledge questions, with 94% overall achieving competency in this area (Table 23). There were no statistically significant differences in competency by clinical role. Self-efficacy scores on adherence counseling were relatively high as well: On the 5-point scale, the mean score for general adherence counseling was 4.3 (SD: 0.7), and for stepped-up adherence counseling, mean score was 3.9 (1.0).

Table 23. Weighted proportion of HCWs achieving competency in adherence counseling services by clinical role at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Clinical role	Proportion of HCWs achieving competency* in adherence counseling services Weighted percent	Mean self-efficacy score in adherence counseling service provision**	
		Counsel client on adherence issues Weighted mean (SD)	Provide stepped up adherence counseling Weighted mean (SD)
Doctor (n=6)	100%	4.3 (0.5)	3.4 (1.3)
Nurse (n=131)	96%	4.3 (0.7)	3.9 (1.1)
Nursing assistant (n=27)	86%	4.2 (0.6)	4.1 (0.8)
Lay cadre (n=90)	***	4.3 (0.7)	3.9 (1.0)
Total (n=164)	**94%** **(n=164)**	**4.3 (0.7)** **(n=248)**	**3.9 (1.0)** **(n=240)**

*Based on a combined knowledge score of at least 66% on adherence counseling survey questions
**On a Likert scale with 1="Not at all confident" and 5="Extremely confident"
***Lay cadres were not surveyed on clinical competencies

Other qualitative findings:

KII participants described the implementation of VL monitoring as a strength of the program; a national-level MOH respondent described ICAP's role as "very key" in these activities. One participant commented that it was clear that ICAP's training of HCWs "happened effectively" during initial implementation because of the rapidly increased use of VL testing at facilities, and that now, "people are knowledgeable they need to be asking on the viral load for every patient." When asked if facilities had been supported enough to use DBS for viral load, one key informant stated:

> *Facilities have been capacity trained, yes… on the actual collection of the DBS, the lab is saying they are good, it is only one facility which [EHLS has] asked ICAP within the Manzini region to go and investigate… at least [EHLS] can talk to [ICAP] and say guys, help us, this is a scenario in one of the facilities in your region they are sending DBS, and they are sending it the wrong way… I think that relationship has made [ICAP and EHLS] to be able to talk and fix issues that come up from the facilities, yes.*

One facility representative reported that, recently:

> *They [ICAP] brought in DBS because we sometimes come across problems whereby… per day you find that we see sometimes 250, 300 or more… we have a lot of queue outside of people wanting to do viral load but they can't do it because… that side in the lab they can only take 70 samples from us, so that one has been a challenge. However, it is somehow being sorted – although it doesn't cover everyone like we wish that everybody, everybody that is eligible be done.*

Another facility representative reported that, "[ICAP] came up with this DBS method that we are using, yeah, I think they are really helping, [they] introduced several registers on how to make sure we capture… all those that we sent to the lab, making sure the results are back, documented, those that are having high viral load are well followed up." Several commented on improved communication and turn-around time from the central laboratories, though ICAP's support to the lab was not provided under the present CoAg and will therefore not be summarized in this report.

VL Summary

ICAP's key contributions to the implementation of routine VL monitoring were acknowledged by KIs at the national, regional and facility levels. VL testing coverage has been a challenge for the program, and though coverage has steadily improved to 76% in FY19, there remains room for improvement. Several KIs noted this, and emphasized that continued efforts are needed to maintain momentum.

The rate of overall viral suppression at ICAP-supported sites reached 97% in FY19, surpassing the goal of 95% of ART patients suppressed. However, viral suppression rates remain lower among children and adolescents, reflecting a similar pattern in national outcomes.

Table 24. Key evaluation indicators and results for VL

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.2 Expand ART coverage, increase timely ART initiation and retention on ART, and roll out VL monitoring	90% of people on ART have viral suppression at 36 months of treatment	Program data: APRs/ISAD •MER indicator TX_PVLS	Achieved (proxy measure)		49

6.4.4 Sub-objective: Support the rollout of the national package of pre-ART services

Key pre-ART activities

Under the implementation of the Test and Start ART guidelines that began in FY16, the pre-ART package of care has been phased out. Clients are typically started on ART the same day or within a very short period of time. Those who are not ready for rapid ART initiation are still followed up using the linkage to care activities described above in section 6.4.2. Limited components of the training and mentoring previously provided under the pre-ART package remain.

Training, mentoring, and supportive supervision

At the start of the program in FY15, ICAP conducted a package of care baseline assessment to guide implementation of clinical mentoring; this included an assessment of adult and pediatric pre-ART enrollment, care and monitoring while on pre-ART, and transition from pre-ART to ART services. Mentorship to facilities in FY15 and FY16 was then provided accordingly in these areas. This included training and mentoring on the 2014 National Integrated Management of HIV guidelines, which were implemented at all supported sites as of December 2015. Beginning in FY16 with the implementation of Test and Start, the training and mentoring focus was shifted to preparing pre-ART patients for ART. However, training and mentoring on comprehensive services for HIV patients, such as IMAI training, is still a part of program activities. ICAP has trained 175 HCWs on IMAI during the grant period.

Evaluation results: Pre-ART

Process indicator: *80% of HCW trained in Integrated Management of Adult and Adolescent Illness (IMAI), and other care related topics*

This benchmark has been almost attained with 76% of the eligible HCWs surveyed (nurses and nurse assistants) reporting ever being trained on IMAI.

All key informant respondents who were asked about IMAI and other care-related training (n=11) reported that it had been carried out satisfactorily. One regional MOH representative noted that staff turnover was a particular issue for IMAI training: "Every facility has to have one who has been trained in IMAI… I think I can say it happened 80% … maybe you cannot find [IMAI-trained staff at the facilities] because they migrate, but the goal was to have one person at least in every facility trained in IMAI." However, a facility representative reported that "[On] IMAI, at least within my facility everybody has been trained, and I'm aware even within the other facilities, almost everybody working there in the ART and even those who don't work in the ART have been trained."

Other qualitative findings:

At a broad level, according to KIs, "…a very successful part of the program, has been the roll-out, initially of the Pre-ART … and now, obviously ART." KIs reported that training and mentoring activities related to pre-ART were carried out at a satisfactory level and quality.

Pre-ART Summary

Pre-ART services were implemented satisfactorily according to KIs, but have since been phased out with the implementation of the Test and Start guidelines. Training and mentoring on comprehensive services for HIV patients, including IMAI, are still being carried out as part of program activities. 76% of surveyed HCWs reported being trained in IMAI, just under the training target of 80% (Table 25). As with HCW training on other topics, staff turnover remains a challenge in achieving training coverage at health facilities.

Table 25. Key evaluation indicators and results for pre-ART

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.6 Support the rollout of the national package of pre-ART services	80% of HCW trained in Integrated Management of Adult and Adolescent Illness (IMAI), and other care related topics	HCW survey Program data: ISAD	Partially achieved	**76%** of eligible HCWs surveyed (nurses & nurse assistants) trained on IMAI	51-52

6.4.5 TB/HIV

Sub-objective: Expand TB/HIV collaborative activities, including the "3 Is:" TB infection prevention and control (IPC), IPT, and intensified case finding (ICF), and improve coordination of TB/HIV services in health care facilities and communities

Sub-objective: Support decentralization of TB diagnostic and MDR-TB services, including to mine workers and prison inmates

Key TB/HIV Activities

Training, mentoring, and supportive supervision

Across all program years, ICAP has conducted training for 1,995 HCWs on TB/HIV topics, including:

- 449 trained on management of TB/HIV co-infection
- 657 trained on TB infection prevention and control (IPC)

- 205 trained on IPT
- 389 trained on the "3 Is:" IPT, IPC, and intensified case finding (ICF)

In FY18 and FY19, mentoring has emphasized the following topics in response to current program challenges and objectives:

- TPT
- TB contact tracing, particularly for children under 5
- Diagnosis of childhood TB
- Initiation of TB/HIV co-infected patients on ART within 2-8 weeks of starting TB treatment

TA to implement TB IPC practices at facilities

ICAP provided TA to supported facilities to ensure that each has a designated TB IPC focal person and has developed a TB IPC plan. TA activities were complemented by training and mentoring on IPC plans, and quarterly monitoring of progress.

Decentralization of TB/MDR-TB services through accreditation of TB Basic Management Units (BMUs)

ICAP has supported 7 facilities in achieving accreditation as BMUs, by providing construction of facility space for service delivery and conducting joint readiness assessments for accreditation with the NTCP. In FY18, 6 facilities in Manzini were accredited, bringing the regional total of ICAP-supported BMUs to 24 from an original total of 17.

HR support

ICAP supported cough monitors responsible for TB screening at facilities; in FY15 3 cough monitors were supported, in FY16 20 were supported, and since then 30-32 cough monitors have been supported annually.

National-level TB activities

The work done by ICAP in its role as the national IP for TB (described in detail under the Objective 1 findings) was also cited by national MOH and facility KIs as a contributor to regional and facility-level TB/HIV processes and outcomes. This included the development of national guidelines and a national manual for TB management, and capacity-building of the NTCP, including the appointment of a TB/HIV Technical Advisor to ENAP/SNAP.

Evaluation results: TB/HIV

Process indicator: *90% of PEPFAR-supported health facilities have facility-specific TB Infection Control Plans*

By the end of FY18, 42 of the 43 ICAP-supported facilities (97.7%) had developed IPC plans, exceeding the evaluation benchmark of 90%.

Process indicator: *90% of PEPFAR supported health facilities in the region providing quality-assured TB and MDR TB diagnosis and treatment services in line with the TB/HIV decentralization plan (BMUs)*

Of the 43 PEPFAR-supported health facilities in Manzini, 24 (55.8%) have now been accredited as BMUs.

Process indicator: *90% of PEPFAR-supported health facilities implement TB screening of all HIV patients on each visit*

As of the end of FY19 Q2, 41 of the 43 facilities (95.3%) had implemented a policy of TB screening of all HIV patients on each visit, exceeding the evaluation benchmark of 90%.

Outcome indicator: *Proportion of facilities supported by PEPFAR in the region that screen 100% of HIV patients for TB on their last visit increased to 95%*

During the first half of FY19, 37 of the 43 facilities (86.0%) had conducted screening of 100% of ART patients (used as a proxy measure for HIV patients) at their last visit. However, other facilities were close to reaching 100% of ART patients screened: 39 of the 43 facilities (90.7%) had screened at least 99% of ART patients, and 41 of the 43 facilities (95.3%) had screened at least 95%.

Outcome indicator: *Proportion of patients screened positive for TB who have received TB diagnostic testing increased to 90%*

The proportion of patients screened positive for TB who have received diagnostic testing was 100% in the second half of FY18 and first half of FY19, exceeding the evaluation benchmark of 90%. In earlier measurement periods, the proportion tested was more variable, ranging between 34% and 100% (see Table 26).

Outcome indicator: *Percent of PEPFAR-supported facilities where 100% of TB patients with HIV received ART within 8 weeks of diagnosis increased to 90%*

Data were not reported by timing of ART initiation; the proportion of TB patients with HIV receiving ART was calculated to assess this indicator instead. The denominator for this measure was limited to BMUs, since patients with TB and HIV receive ART at TB treatment facilities. Of the 24 ICAP-supported BMUs, 12 (50.0%) had initiated 100% of adult TB patients with HIV on ART, and 15 (63%) had initiated at least 95%, as of FY19 Q3. For pediatric TB patients with HIV, rates of initiation on ART were lower, with just one facility (4%) having initiated 100% of children with TB and HIV on ART.
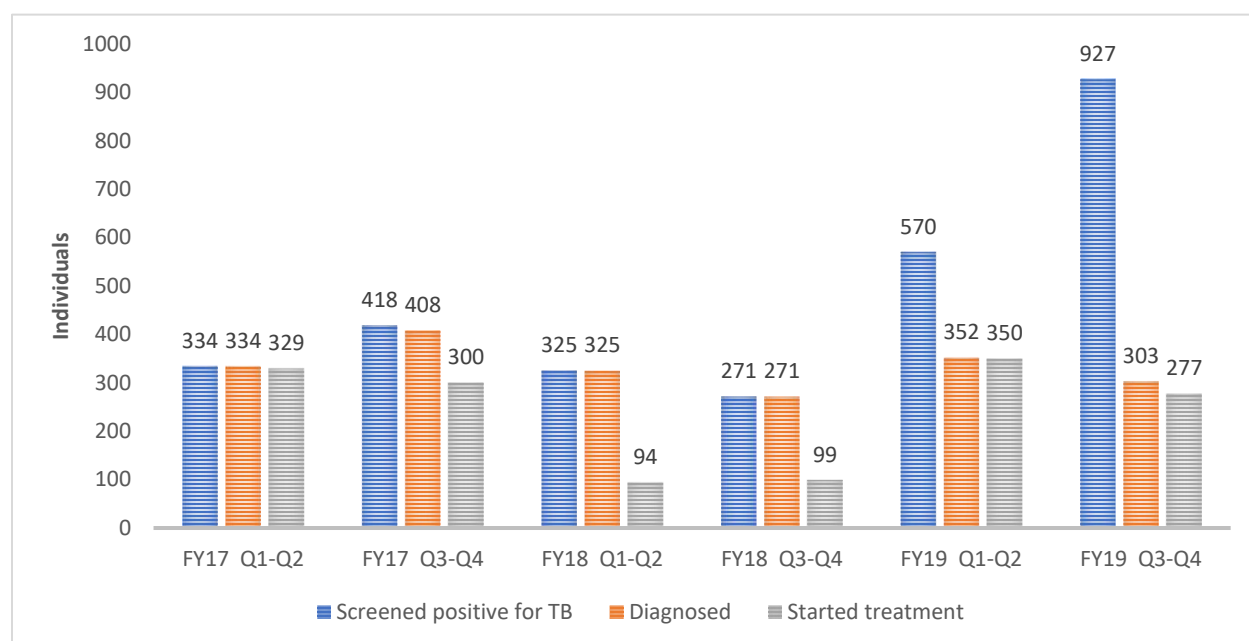
Table 26. ART patients screened for TB, screened positive, received diagnostic test, and started treatment at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY17 – FY19

Report-ing period	ART patients total*	ART patients screened for TB*				Patients screened positive*		Patients received diagnostic test*		Patients diagnosed with TB (clinical or laboratory diagnosis)*		Patients started TB treatment*	
	Result	Target	Result	% of target achieved	% of ART patients screened	Result	% screened positive	Result	% of screened positive rcvd diagnostic test	Result	% of screened positive diagnosed with TB	Result	% of TB diagnosed started treatment
FY17 Q1-Q2	52,204	N/Aª	43,023	N/Aª	85%	334	1%	112	34%	334	100%	329	97%%
FY17 Q3-Q4	50,551	N/Aª	47,806	N/Aª	95%	418	1%	418	100%	408	98%	300	74%%
FY18 Q1-Q2	58,574	44,602	58,303	131%	100%	325	1%	215	66%	325	100%	94	29%%
FY18 Q3-Q4	58,507	44,602	56,179	126%	96%	271	0%	271	100%	271	100%	99	37%%
FY19 Q1-Q2	57,899	58,766	50,500	86%	81%	570	1%	570	100%	352	62%	350	99%
FY19 Q3-Q4	62,006	58,766	61,777	105%	100%	927	2%	927	100%	303	33%	277	91%

*Based on PEPFAR MER indicators TX_CURR and TX_TB. Data source: ISAD/DATIM.
ªNo targets were provided by PEPFAR for this reporting period/data are not available.

Figure 3. TB clinical cascade among ART patients at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY17 – FY19

Based on PEPFAR MER indicators TX_CURR and TX_TB. Data source: ISAD/DATIM.

Outcome indicator: *Number and percentage of ART patients screened for TB*

The TB screening, diagnosis and treatment cascade for ART patients is shown in Table 26 and Figure 3; these data were collected semiannually beginning in FY17. Targets were set for the number of ART patients screened beginning in FY18, and the number screened exceeded the target by at least 26% in both FY18 reporting periods. In the first half of FY19, an increased target and decreased number of patients screened resulted in 86% of the target being achieved, but by the second half of the year, the number screened once again exceeded the target (105%).

At the time it was first measured in FY17 Q2, the number of ART patients screened for TB represented 85% of all ART patients (Table 26). Since that time, the proportion of ART patients screened during each reporting period has ranged from 81% to (most recently, in FY19 Q3-4) 100%.

Outcome indicator: *Percentage of ART patients screened positive for TB; Percentage screened positive who received a diagnostic test; Percentage screened positive diagnosed with TB*

The percent of ART patients screened for TB who received a positive result has been 2% or less during each reporting period (Table 26). Of those with a positive screening result, the percent receiving a diagnostic test has generally increased over time, from 34% receiving diagnostic testing in FY17 Q1-Q2, to 100% in the second half of FY18 and throughout FY19. The percentage of those screened positive who ultimately received a TB diagnosis has decreased over time. This reflects the differing diagnostic methods used: In earlier years, clinical assessment was used to diagnose most patients, whereas in FY19, all patients with a positive TB screen received a diagnostic test.

Outcome indicator: *Percentage of ART patients diagnosed with TB started on treatment*

The percent of ART patients diagnosed with TB who begin treatment has varied widely, between 29% and 97% during FY17 and FY18, but was over 90% throughout FY19 (Table 26).

Table 27. TB patients with known HIV status, with TB/HIV coinfection, and receiving ART at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	TB patients total*	TB patients with known HIV status*				TB patients with HIV*		Patients with TB/HIV on ART*			
	Result	Target	Result	% of target achieved	% of TB patients with known HIV status	Result	% of TB patients with HIV	Target	Result	% of target achieved	% of patients with TB/HIV on ART
FY15	255	N/A**	255	N/A**	100%	N/A**	N/A**	N/A	374	N/A**	N/A**
FY16	1,222	N/A**	1,196	N/A**	98%	N/A**	N/A**	N/A	816	N/A**	N/A**
FY17	681	2,132	679	32%	100%	481	71%	1,449	453	31%	94%
FY18	972	1,701	961	57%	99%	685	71%	1,191	660	55%	96%
FY19	942	1,681	937	56%	99%	653	69%	1,202	627	52%	96%

*Based on PEPFAR MER indicators TB_STAT and TB_ART. Data source: INSIGHT.
**Targets were not provided by PEPFAR for this reporting period/data not available.

Outcome indicator: *Proportion of TB patients with known HIV status*

This indicator proportion (see Table 27) has remained consistently high: 98% to 100% over the course of the project. Although the annual PEPFAR targets for the number of TB patient with known HIV status have not been met, the low percentage of the targets achieved has been driven almost entirely by an upstream issue in the cascade: The low number of total known TB patients relative to targets, which is in turn partly due to the trend of declining TB case notification in Eswatini.

Outcome indicator: *Proportion of TB/HIV patients receiving ART*

The proportion of patients with TB and HIV coinfection who receive ART was 94% in FY17 and 96% in FY18-FY19, indicating good HIV treatment coverage among this group.

Outcome indicator: *Proportion of ART patients who complete a standard course of TPT within the reporting period*

The percent of ART patients who completed a course of TPT increased from 41% in FY17 to 80% in FY19 (Table 28). The denominator for this measure, the number of ART patients who started a course of TPT, nearly doubled from FY18 to FY19, but remained low relative to the program target at 10,478 (29% of the annual target). Likewise, the number of ART patients completing TPT in FY19 was 8,367, which is equivalent to 27% of the annual target. Failure to meet the TPT completion target was driven mainly by the low initiation numbers; 80% of ART patients who started TPT in FY19 completed it.

Table 28. Percentage of ART patients completing a course of TPT at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	Number of ART patients started TPT*			Number of ART patients completed TPT*			% ART patients completed TPT
	Target	Result	% of target achieved	Target	Result	% of target achieved	
FY17	N/A**	4,724	N/A**	N/A**	1,914	N/A**	41%
FY18	21,544	5,820	27%	17,233	4,217	25%	73%
FY19	35,858	10,478	29%	30,477	8,367	27%	80%

*Based on PEPFAR MER indicator TB_PREV. Data source: INSIGHT.

KIs described TPT as a remaining gap; one stated that "It's about [both] coverage and completion. So we are not there yet for both of those and probably need some work." Referencing the increase in completion in FY19, another commented that TPT was "still a problem, but there has been that slight improvement."

Other qualitative findings:

Specific issues identified by KIs included documentation and monitoring of TPT. Regarding documentation, one attributed the problem to the quality of mentorship, commenting that "[facilities] are not documenting things the way they should be, and that's a mentorship issue. They are not documenting people who start IPT and stay on IPT…" Another noted that incorporating TPT tracking into CMIS would be preferable to paper registers, and that additionally, "…even when you have a paper register, you would have expected that there is a process of supporting MOH to sort of aggregate the data so that you see what is happening at regional and at a national level." The same representative commented that TPT indicators should be a "key" indicator for NaHSAR and ReHSAR monitoring activities.

Facility-level KIs reported that they had observed ICAP's recent mentoring activities that focused specifically on TPT. One reported that ICAP had supported "especially [on] IPT," explaining that, "[ICAP] came… they trained us on the need for initiating IPT to those deserving clients and they also worked… with the ART nurses in helping dispensing those IPTs.

On integration of TB screening:

All KII participants who were asked to comment on TB screening, including facility, funder, and MOH representatives, viewed TB screening activities as a strength of the program. Several facility key informant respondents commented that cough monitors have been a key reason for improved TB screening rates at their facilities. As one facility representative described, TB screening had been successfully integrated into a variety of service areas with the provision of ICAP-supported cough monitors: "We do we have TB screening officers, at OPD, we have them at dental department they are being screened for TB, at HTS services they are being screened, the VCT we are screening for TB, so we are really screening TB." One national-level MOH representative noted that in particular "TB screening is happening at every [HIV] testing point," and another reported that "TB screening is done routinely in most ART services."

On the integration of TB and HIV services at all levels:

KIs, particularly those representing facilities and the national MOH, commented positively on changes that have occurred in the integration of TB/HIV services at multiple levels: Within facilities, between facilities, and at the national level in terms of MOH support to facilities.

In KIIs, facility representatives consistently reported that ICAP's mentoring included a strong focus on the integration and collaboration between TB and HIV services. Within facilities, informants reported that TA and mentoring by ICAP had assisted in establishing integration of services. One commented, "[ICAP] helped us, like now… the TB clinic integrates ART, so a patient who is diagnosed with TB receives all their [HIV] services in the TB clinic, and when you go to the ART also you find that you can find TB screening there, diagnosis, and they also walk the patient to the TB clinic if they are diagnosed with TB."

Improvement in linkages between facilities for TB/HIV care was noted by several KIs as well. One attributed this to HR support, reporting that "Because of ICAP, we even have a linkage officer" supporting linkages to TB/HIV services. Another described broader structural changes:

> *[Before] people they were coming here for TB management and they were going somewhere [else] for HIV treatment. So now those services have been integrated, people while they are on [TB] treatment this side, they are being temporarily transferred to us [for HIV care]… once they are*

> *cured or completed their [TB] treatment this side, then we refer them back to their treatment sites for chronic care for HIV.*

At the national level, improved support by MOH for integrated TB/HIV services at facility-level was noted by two respondents. They both attributed this to the Technical Advisor that ICAP supported within SNAP/ENAP to focus on TB/HIV. This has been reported in detail under the Objective 1 findings.

On TB outcomes:

Facility and funder-level informants described increases in the national and regional TB treatment success rate since the beginning of the program. One KI attributed this to "reduction in the loss to follow-up," which "we've reduced… to about 2% or less in most regions," and noted that "…the program has done brilliantly on that part." Another commented that, "…looking at the [TB] mortality I think that we have had some improvements… in the last 5 years since 2015, that's where now Eswatini has started using newer drugs, so I think it was national efforts but with a push and technical support from ICAP."

However, some KIs saw the minimal improvements in TB mortality as an indication that more work is still needed. One commented that mortality due to TB has been "…more or less the same for the last 5 years, so there's been very little movement in the mortality, and we've made an effort to push ICAP to actually address mortality because we realize that, that's the missing piece that needs to be addressed."

TB/HIV Summary

Table 29 summarizes findings on selected indicators for TB/HIV. ICAP has invested training, mentoring, TA, HR and other support towards integrating and improving the quality of TB/HIV services. These activities, along with ICAP's support to MOH for TB and TB/HIV services at a national level under Objective 1, were described by KIs as positively impacting TB screening and integration of TB/HIV activities at the national level. The program has generally performed well in the implementation of TB screening. Ninety percent of ICAP-supported facilities have facility-specific TB Infection Control Plans and have a policy of TB screening for all HIV patients on each visit. Eighty-six percent of facilities had successfully carried out that screening policy. The percent of ART patients screened for TB at their last visit has remained above 95% since the second half of FY17. The percent of patients screened positive who received diagnostic testing has been inconsistent, particularly in earlier years, ranging from 33% to 100%, but has remained at 100% over the last year. Similarly, out of those diagnosed with TB, the percentage receiving treatment was highly variable in FY17 and FY18, ranging between 29% and 97%, but throughout FY19, over 90% received treatment. The stagnant TB mortality rate and low numbers of patients initiating and completing TPT (29% and 27% of the FY19 targets, respectively; 80% of ART patients initiating TPT in FY19 completed it) were identified as remaining gaps to be addressed.

Table 29. Key evaluation indicators and results for TB/HIV

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.3 Expand TB/HIV collaborative activities (the 3 Is) and improve coordination of TB/HIV services	90% of PEPFAR supported health facilities have facility-specific TB Infection Control Plans	Program data: APR18	Achieved		53

in HFs and communities	90% of PEPFAR supported health facilities implement TB screening of all HIV patients on each visit	Program data: ISAD •MER indicator TX_TB	Achieved		53
	Proportion of facilities supported by PEPFAR in the region that screen 100% of HIV patients for TB on their last visit have increased to 95%	Program data: ISAD •MER indicator TX_TB and TX_CURR	Partially achieved	**86%** of facilities screened 100% of HIV patients for TB. 95% of facilities screened >95% of HIV patients for TB.	54
	Proportion of patients screened positive for TB who have received TB diagnostic testing increased to 90%	Program data: ISAD •MER indicator TX_TB	Achieved		54
	Percent of PEPFAR supported facilities where 100% of TB patients with HIV received ART within 8 weeks of diagnosis increased to 90%	Program data: ISAD •MER indicator TB_ART	Partially achieved	100% of TB patients receiving ART in **30%** of facilities	54

6.4.6 PMTCT

Sub-objective: Support expansion of comprehensive PMTCT services including Option B+ and pilot innovations in PMTCT

Key PMTCT Activities

Training, mentoring, and supportive supervision

ICAP provided training to HCWs on a number of topics related to PMTCT, including 240 HCWs trained on EID or birth testing between FY16 and FY18.

ICAP mentors have supported facility staff in providing PMTCT services, along with EID/birth testing (which was piloted in two ICAP-supported hospitals that provide maternity services) and initiation of infants with HIV on ART. Mentoring has included monthly review of PMTCT cascades, and routine monitoring of birth cohorts to determine final outcomes. In FY18 and FY19, this has included hands-on support from mentors to ensure that all infants testing HIV-positive on a DNA PCR test are initiated on ART as soon as test results are received. This involves contacting and recalling the infants' mothers to the facility, and counseling families on the importance of immediate ART initiation.

HR support

The lay HTS counselors (between 22 and 43 supported by ICAP each year) and expert clients (55 to 80 each year) contributed to the provision of PMTCT services at facilities, in addition to supporting HTS and ART services generally as previously described.

TA to the National PMTCT TWG

ICAP has actively and regularly participated in the PMTCT TWG during the program period. In FY16, ICAP contributed TA to the creation of a system for improved tracking of mother-infant outcomes.

Evaluation results: PMTCT

Outcome indicator: *Percentage of pregnant women with known HIV status*

The percentage of pregnant women with known HIV status has remained at 92% or higher over all program years. In FY18 and FY19, 99 to 100% of new antenatal care (ANC) clients knew their HIV status.

Table 30. Percentage of pregnant women with known HIV status at antenatal care at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

| Reporting period	# of pregnant women with known HIV status*			# of new ANC clients*			% of pregnant women with known HIV status		
	Target	Result	% of target achieved	Target	Result	% of target achieved	Target	Result	% of target achieved
FY15	N/A**	1,304	N/A**	N/A**	1,365	N/A**	N/A**	96%	N/A**
FY16	8,919	6,823	76%	9,391	7,356	78%	95%	93%	98%
FY17	9,532	7,722	81%	10,027	8,371	83%	95%	92%	97%
FY18	10,093	8,305	82%	10,632	8,378	79%	95%	99%	104%
FY19	8,289	8,600	104%	8,733	8,643	99%	95%	100%	105%

*Based on PEPFAR MER indicator PMTCT_STAT. Data source: INSIGHT.
**Targets were not provided by PEPFAR for this reporting period.

The number of pregnant women who attended ANC or delivered who had a known HIV status, either through testing or prior diagnosis, has come closer to achieving program targets each year, finally exceeding the target in FY19.

Similarly, the total number of ANC clients ranged between 78% and 83% of the annual target during FY16-FY18, and achieved 99% of the annual target for FY19.

Outcome indicator: *Number of pregnant women living with HIV, and percent receiving ART*

As shown in Table 31, the number of pregnant women living with HIV attending ANC at ICAP-supported facilities has generally increased each year, and exceeded program targets in FY19. In FY15 the relatively low number and percent of annual target achieved reflects the fact that relevant program activities did not commence until Q4 of that year. From FY16-FY18, between 67% and 78% of the program target was met. The number of women receiving ART followed a similar pattern; from FY16 to FY18, it reached between 75% and 84% of program targets each year, and finally surpassed the target number in FY19.

Meanwhile, the percentage of pregnant women living with HIV attending ANC who receive ART has remained steadily high, between 96% and 100% each year since FY15 (Figure 4 and Table 30). This percentage has exceeded the program target by at least 1% each year.

Table 31. Percentage of pregnant women with HIV who received ART to reduce the risk of mother-to-child transmission during pregnancy at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	# pregnant women with HIV*			# pregnant women with HIV who receive ART**			% pregnant women with HIV who receive ART		
	Target	Result	% of target achieved	Target	Result	% of target achieved	Target	Result	% of target achieved
FY15	N/A***	1,174	N/A***	N/A***	1,144	N/A***	N/A***	97%	N/A***
FY16	3,863	2,591	67%	3,222	2,500	78%	83%	96%	116%
FY17	3,509	2,587	74%	3,334	2,487	75%	95%	96%	101%
FY18	3,750	2,943	78%	3,380	2,826	84%	90%	96%	107%
FY19	2,825	3,039	108%	2,690	3,025	112%	95%	100%	105%

*Based on PEPFAR MER indicator PMTCT_STAT. Data source: INSIGHT.

** Based on PEPFAR MER indicator PMTCT_ART. Data source: INSIGHT.

***Targets were not provided by PEPFAR for this reporting period.

Process indicator: *Proportion of PEPFAR supported health facilities that achieve 95% ART coverage for pregnant and lactating women increased to 90%*

Thirty-six facilities achieved 95% or greater ART coverage among pregnant women living with HIV as of FY19 Q3. This represents 90% of the 40 ART-initiating facilities supported by ICAP in Manzini, meeting the target set for the evaluation.

Figure 4. PMTCT coverage at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19
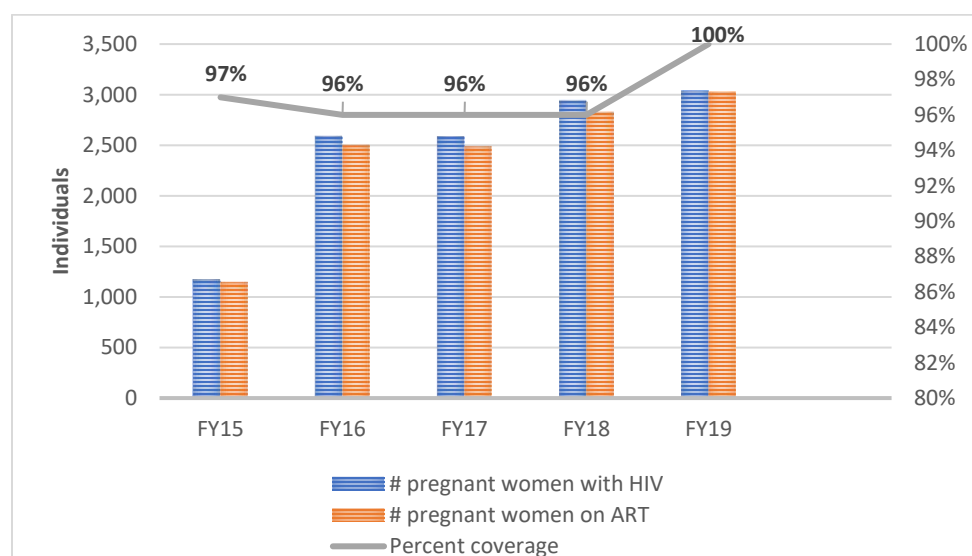
Based on PEPFAR MER indicators PMTCT_STAT and PMTCT_ART. Data source: INSIGHT.

Outcome indicator: *Percent of infants with first virologic test conducted by 12 months*

The number of infants born to women with HIV whose first virologic HIV test was conducted by 12 months of age progressed towards increasing program targets each year from FY15-FY18 (Table 32); when the annual target was reduced in FY19, 110% of the target was achieved. The percent of infants with a virologic

test by 12 months out of all pregnant women living with HIV identified in the reporting period has also generally increased since FY15, and has been 95% or greater in each of the past 4 years. Due to the use of a proxy measure for the denominator (see footnote to Table 31), this measure actually exceeded 100% in FY17 and FY18.

Table 32. Percentage of infants born to women with HIV who received a first virologic HIV test (sample collected) by 12 months of age at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	Number of infants born to women with HIV who receive first virologic HIV test by 12 months*			Number of pregnant women with HIV identified during the reporting period**			% of infants born to women with HIV who receive first virologic HIV test by 12 months
	Target	Result	% of target achieved	Target	Result	% of target achieved	Result
FY15	3,719	472	13%	3,832	1,174	31%	40%
FY16	3,490	2,461	71%	3,863	2,591	67%	95%
FY17	3,334	2,825	85%	3,509	2,587	74%	109%
FY18	3,532	3,111	88%	3,750	2943	78%	106%
FY19	2,687	2,961	110%	2,825	3,039	108%	97%

*Based on PEPFAR MER indicator PMTCT_EID. Data source: INSIGHT.
**MER indicator PMTCT_STAT_POS was used a proxy measure for this count, instead of the formula for the PMTCT_EID denominator, because the denominator formula relies on disaggregations that are not available for all years.

Outcome indicator: *HIV transmission rate from maternal to child decreased to less than 5% at 18 months at PEPFAR supported health facilities*

The number of children who test HIV-positive by 18 months of age, as a proportion of all HIV-infected infants (HEI) in their birth cohort, has remained below 5% for all program years measured to date (see Table 32), exceeding evaluation targets.

However, this may not be an accurate reflection of the true HIV transmission rate from mother to child, since a substantial percentage of HEI are lost to follow-up and do not have a documented outcome recorded at 18 months (Table 33). The percentage of infants with outcome unknown actually increased from FY15 to a peak of 47% in FY17; in FY18, it dropped to 32% and remained at 34% in FY19. KIs commented on this issue as well. One observed:

> *I think around 98, 99 percent of the mothers are testing for their status. The issue now which lies there is the issue of the pediatric test. Yeah, because once they are still under the PMTCT program, we are able to get them, they test and I think it is working very well, but once they are out that is when we start to lose the pediatrics cases.*

Table 33. PMTCT outcomes at 18 months of age at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY15 – FY19

Reporting period	Total # HEI born 24 months prior to reporting period & registered in birth cohort*			# HEI with a documented outcome by 18 months of age*				# HEI with HIV*		# HEI with unknown outcome*	
	Target	Result	% of target achieved	Target	Result	% of target achieved	% with docu-mented outcome	Result	% with HIV	Result	% outcome unknown
FY15	N/A**	2,010	N/A**	N/A**	1,699	N/A**	85%	26	1%	199	10%
FY16	1,678	2,817	168%	1,678	1,682	100%	60%	104	4%	1,114	40%
FY17	N/A**	3,277	N/A**	N/A**	1,729	N/A**	53%	66	2%	1,548	47%
FY18	N/A**	3,171	N/A**	N/A**	2,166	N/A**	68%	55	2%	1,023	32%
FY19	N/A**	2,881	N/A**	N/A**	1,889	N/A**	66%	45	2%	992	34%

*Based on PEPFAR MER indicator PMTCT_FO. Data source: ISAD.
**Targets were not provided by PEPFAR for this reporting period

Outcome indicator: *Proportion of HCWs competent in the provision of PMTCT services*

The proportion of HCWs achieving a "competent" score on knowledge questions regarding PMTCT was just 50% overall (Table 34). A higher proportion of doctors compared to nurses and nursing assistants achieved a 'competent' score in this area, but differences in competency across groups were not statistically significant. Self-efficacy scores were similarly moderate, with a mean of 3.4 (SD: 1.3) and 3.0 (1.4) for PMTCT initiated pre-partum and during labor, respectively.

Table 34. Weighted proportion of HCWs achieving competency in PMTCT services by clinical role at selected ICAP-supported health care facilities (n=23) in Manzini Region, Eswatini, FY19

Clinical role	Proportion of HCWs achieving competency* in PMTCT services	Mean self-efficacy score in PMTCT services**	
		Administer PMTCT pre-partum	Administer PMTCT during labor
	Weighted percent	Weighted mean (SD)	Weighted mean (SD)
Doctor (n=6)	71%	2.8 (1.6)	2.8 (1.6)
Nurse (n=131)	53%	3.9 (1.1)	3.4 (1.2)
Nursing assistant (n=27)	31%	3.8 (0.9)	3.4 (1.2)
Lay cadre (n=90)	***	2.4 (1.2)	2.0 (1.1)
Total	**50%** (n=164)	**3.4 (1.3)** (n=193)	**3.0 (1.4)** (n=169)

*Based on a combined knowledge score of at least 66% on PMTCT survey questions
**On a Likert scale with 1="Not at all confident" and 5="Extremely confident"
***Lay cadres were not surveyed on clinical competencies

Other qualitative findings:

As with other HTS and ART activities, key informants reported that the expert clients supported by ICAP played an important role in delivery of PMTCT services at facilities. As one facility representative described:

Before we started it was like a mountain, it was, I mean with the staff from the maternity they were thinking it was something that will be very much impossible, they can't initiate [ART] same day, what what what. But ICAP came, supported us with more expert clients, with more HTS counsellors and we were able to do the job. Now, as we speak we are doing well. So women coming with an unknown status in the maternity they are being tested and initiated the same day, and being transferred, linked…

It should be noted that during the same time period, mentor mothers supporting PMTCT were funded by USAID to work in facilities as well. However, all KI comments describing HR support referred specifically to ICAP-funded expert clients.

Facility representatives also confirmed the provision of training and mentoring on PMTCT. One facility representative reported that "ICAP [mentors] they are usually there with us in maternity, in the wards, they help us," to ensure the provision of HTS, ART for mothers, and prophylaxis for infants when needed. A key informant representing the MOH at the national level noted that for PMTCT "mentorship, they visit sites every month, the PHUs, everything."

KIs attested to ICAP's role in the TWG. A national MOH representative commented, "…in technical working groups they [ICAP] are there, and the good thing is that it is not just physical presence but it's even technical presence in terms of contributions that is much appreciated. And it is not just to the care and treatment… I know them very much for the PMTCT."

PMTCT Summary

A summary of key PMTCT indicators is presented in Table 35. The percentage of pregnant women living with HIV who receive ART has remained steadily high, between 96% and 100% each year since FY15. Thirty-six of 40 of ICAP-supported ART-initiating facilities (90%) have achieved 95% or greater ART coverage among pregnant women living with HIV. ICAP's support for expert clients was seen as key in the successful provision of PMTCT services. Although the proportion of HEI testing positive remains low, at 2% in FY17 through FY19, the high percentage of HEI with unknown outcome at 18 months (34% in FY19) presents a challenge. Just half of the surveyed HCWs achieved competency in PMTCT services.

Table 35. Key evaluation indicators and results for PMTCT

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.4 Support expansion of comprehensive PMTCT services including Option B+ and pilot innovations in PMTCT	Proportion of PEPFAR supported health facilities that achieve 95% ART coverage for pregnant and lactating women increased to 90%	Program data: ISAD •MER indicator PMTCT_ART	Achieved		61
	HIV transmission rate from maternal to child decreased to less than 5% at 18 months at PEPFAR supported health facilities	Program data: ISAD •MER indicator PMTCT_FO	Achieved		62

6.4.7 MNCH and integrated HIV/SRH

Sub-objective: Leverage PMTCT interventions to strengthen the MNCH platform and integrate HIV/SRH service delivery

Key MNCH and SRH Activities

Regional baseline assessment

In FY17, ICAP conducted a regional baseline assessment of TB/HIV collaborative activities in six public health units (PHUs) alongside integration of TB/HIV services in maternal, neonatal and child health (MNCH) clinics, to inform program activities.

Training, mentoring, and supportive supervision

Training was provided to HCWs on key SRH and MNCH topics, including family planning and cervical cancer screening using the visual inspection of cervix with acetic acid (VIA) method. ICAP also developed a cervical cancer screening logbook and reporting tool in FY17.

HR support

The program supported 5 additional nurses at facilities specifically to perform cervical cancer screening in FY18, and an additional 7 were hired in 2019 bringing the total number to 12.

Infrastructure and equipment

During FY19, ICAP supported the procurement of equipment and refurbishments to set up integrated cervical cancer screening at 22 health facilities for women on ART using VIA. In addition, ICAP procured equipment to provide cryotherapy at 12 facilities and LEEP services at three facilities.

Evaluation results: MNCH and SRH

Process indicator: *Proportion of labor and delivery sites that received at least monthly on-site mentoring visits increased to 100% in PEPFAR supported health facilities*

Of the two labor and delivery sites supported by ICAP, both have received at least monthly on-site mentoring visits, meeting the evaluation target.

Process indicator: *Proportion of supported facilities providing integrated SRH (FP, Cervical Cancer screening etc.) and HIV services increased to 100%*

As of APR18, there were 36 ICAP-supported facilities in Manzini region providing integrated family planning services with HIV services. These represent 90% of the 40 facilities that provide HIV management. At the time of data collection for this report, cervical cancer screening services were available at 22 facilities (55%) and were still being rolled out at other sites. Thus, this evaluation target has been partially met.

Outcome indicator: *Cervical cancer screening results*

Results for cervical cancer screening during FY19 are reported in Table 36. The number of screenings completed represented just 49% of the target set for the year. Of the 8,178 patients screened, 6% screened positive for cervical cancer, and 70% of those screening positive received treatment.

Table 36. Cervical cancer screening results at ICAP-supported health care facilities (n=43) in Manzini Region, Eswatini, FY19

Reporting period	Total # of patients screened for cervical cancer*			# patients screened positive for cervical cancer*		# patients receiving treatment for cervical cancer*	
	Target	Result	% of target achieved	Result	% screened positive	Result	% of screened receiving treatment
FY18	N/A**	5,140	N/A**	332	6%	272	82%
FY19	16,840	8,178	49%	526	6%	368	70%

*Based on PEPFAR MER indicators CXCA_SCRN, CXCA_SCRN_POS, and CXCA_TX. Data source: ISAD (FY18); INSIGHT (FY19).
**Program targets were not set for FY18

Other qualitative findings:

The integration of cervical cancer screening, though recently implemented, was described as a success at the facility level by KIs: "There are nurses who are assisting in the cervical cancer screening so now I can say it is up running very very very well, I never knew it can be that easy until they implemented it." A respondent also described infrastructure improvements to the screening room: "…They refurbished the room, put cupboards and everything, bought… us a couch and everything and now they also provided… the registers, and now [screening] is up running very well."

The integration of family planning services remained more challenging. As one KI put it, the integration of family planning is:

> *…not where it should be, as a country. Not really an ICAP problem alone, it's a national problem, we've not integrated family planning enough between HIV services. And ICAP is also, basically falls in that category where we don't think they have done enough because as a country we haven't done enough, currently.*

A regional MOH key informant noted that this has been a bigger challenge at the larger hospitals than at the smaller clinics. Additionally, at three facilities FP services could not be integrated because of legislation (correctional facilities) or religious beliefs (St. Juliana).

MNCH and SRH Summary

Table 37 presents a summary of MNCH and SRH findings based on key indicators. ICAP has successfully provided mentoring visits at least monthly to both PEPFAR-supported labor and delivery sites in Manzini. The integration of family planning services into HIV services remains a challenge, though it has occurred at 36 of 40 ICAP-supported ART-initiating facilities. The rollout of cervical cancer screening to 22 facilities, which ICAP supported through training, staffing, infrastructure improvements and renovations, was seen as a success by facility representatives. However, the number of cervical cancer screenings conducted in FY19 was approximately half of the target number for the year, mainly due to delays in setting up the service in the targeted facilities, including deployment of nurses to conduct the screening. Of those who screened positive for cervical cancer in FY19, 70% received treatment.

Table 37. Key evaluation indicators and results for MNCH and SRH

Sub-objective	Indicator	Primary Data Source	Evaluation results	Comments (if results not yet achieved)	Details on report page #
3.5 Leverage PMTCT interventions to strengthen the MNCH platform and integrate HIV/SRH service delivery	Proportion of labor and delivery sites that received at least monthly on-site mentoring visits increased to 100% in PEPFAR supported health facilities	Program data: ISAD/Technical Activity Log (TAL)	Achieved		65
	Proportion of supported facilities providing integrated SRH (FP, Cervical Cancer screening etc.) and HIV services increased to 100%	Program data: ISAD •MER indicator FPINT_SITE	Partially achieved	**90%** of ICAP-supported health facilities providing integrated family planning; **55%** providing cervical cancer screening	65

6.4.8 Key Populations

Sub-objective: Train and mentor HCW to reduce stigma / discrimination against key populations and increase their access to services

This sub-objective was removed from the program work plan as of FY17.

Evaluation results: KP

Process indicator: *Key populations related stigma and discrimination training module integrated into Nurse-led ART Initiation NARTIS training*

This activity was not completed before the sub-objective was removed from the program work plan.

6.4.9 Limitations

Program administrative records and aggregate data review

One key limitation of the aggregate data review is that not all of the evaluation process and outcome indicators specified in the evaluation framework correspond exactly with available information. This is partly because the evaluation framework was originally developed in early 2018 but due to a long approval process the evaluation was not initiated until 2019; additionally, many of the indicators are based on the original request for applications from 2014, and there have been changes in many of the PEPFAR indicators. Where the evaluation measures differed from current MER indicators, or required information that differs from the data the program collects, proxy measures were used. For example, one evaluation protocol indicator specified the percent of patients with suppressed viral load after 36 months of treatment; however, the analysis was based on the current MER indicator which includes patients after at least 3 months of treatment. In the instances where proxy measures were used, this has been stated in the report, and the measure used has been described along with the findings.

As a related issue, because PEPFAR has implemented several different iterations of the MER indicators since 2014, slight changes in the definition and measurement of indicators over time meant that data were not always easily comparable across years. For example, the new viral load MER indicator TX_PVLS was introduced in FY17, and its differences from the previously used indicators make comparison of data from FY15-16 with that from FY17-19 difficult.

Additionally, although the larger program objectives have remained the same over the implementation period, the sub-objectives, work plan and PEPFAR MER targets have shifted annually in accordance with PEPFAR targets, reflecting changes in WHO guidance and MOH priorities. As a result, tracking the planned and completed program activities over time was a challenge, exacerbated by the lack of a complete and comprehensive annual workplan document that specified activities and their completion status for each year of the program.

KIIs

Participants were not always aware of which of ICAP's activities were supported under the present CoAg, versus other ICAP programs. There was a tendency among respondents to assess all of ICAP's work as a whole, which created challenges in data analysis and interpretation. In instances where interviewees were clearly referring to other ICAP programs or to work that took place prior to 2015, this information was excluded from the analysis.

Additionally, participants were often unable to provide information on activities in the early years of the program, either because they were not in their current organizational roles during that time, or because they could no longer remember the information with certainty.

Finally, although participants were informed during the consent process that results would only be shared in a de-identified format, is possible that respondents did not feel comfortable sharing negative or critical experiences or opinions with evaluators in a conversation that was being audio-recorded and in which they knew findings would be relayed to ICAP. One respondent did request to speak briefly to the evaluators off the record for this reason. However, based on the results of the KIIs, it is clear that respondents were generally comfortable providing both negative and positive feedback on program implementation to the evaluators, so this is unlikely to have had a substantial impact on the findings.

Survey

A key limitation of the survey was the use of convenience sampling within strata of lay and clinical workers at facilities. Stratified random sampling was not feasible within the evaluation timeline; this would have involved the advance identification of specific employees and would therefore have required multiple visits to facilities in order to coincide with selected employees' differing work schedules. Additionally, participation refusals would have required subsequent sampling of replacements, and could have resulted in a non-representative sample regardless of randomization.

Convenience sampling was therefore used instead. This approach allowed the survey to be completed on schedule, but may have resulted in a non-representative sample of HCWs at ICAP-supported facilities in Manzini. This does appear to be the case when considering the small number of doctors (n=6) who participated, representing just 2% of the total survey sample of 254 HCWs. This occurred despite targeted efforts made by data collectors to recruit doctors after this issue was identified during preliminary data reviews. The small number limits our ability to make inferences about the knowledge and competency of doctors. It also suggests that more highly-qualified facility staff were less likely to participate, which may have resulted in lower average knowledge and self-efficacy scores than would have been observed if all HCWs at the facilities were surveyed.

A lengthy approval process for the protocol contributed to a compressed timeline for data collection, analysis, and report writing and did not allow for separate mid-term and end of program evaluations.

Finally, ICAP's work occurred in the context of many other national, regional, and facility-level factors, including the work of other programs and IPs. It is not possible to attribute positive or negative outcomes to the program itself with complete certainty, since we cannot fully disentangle program activities from the context in which they occurred.

7.0   Conclusions and Recommendations

Ultimately, the program has achieved significant progress on all three objectives as of the end of FY19, including progress towards the 95-95-95 HIV targets. A summary of results for key indicators is presented in Appendix B.

The program work plan for the FY20 includes the following:

- Intensify Surge activities to reach the 95-95-95 target of HIV diagnosis, ART initiation and maximum viral suppression including men and adolescents.
- Scale up TLD optimization and transition all clients on sub-optimal first line ART regimen
- Scale up TPT in order to reach 90% of newly diagnosed clients with HIV, and ensure that 60% of those already on ART are put on TPT and 80% of them complete the course of treatment.
- Enhance access to PrEP and VMMC.
- Improve access to cervical cancer screening, so that all women on ART have at least one screening session per year; link all those screened positive on VIA to receive proper treatment using cryotherapy or LEEP.

Based on the evaluation findings, recommendations for additional, specific activities have been identified for the final year of the program and beyond. These activities, presented in Table 38, are intended to target key program areas in which results have been partially achieved, or where stakeholders identified particular gaps or challenges. Recommendations are intended for implementation as program funding availability and time allow; they may also be relevant to future work that occurs after the end of the current CoAg.

Table 38. Identified gaps/challenges and program recommendations

Objective	Remaining gaps and challenges identified	Recommendations
Multiple objectives	• Survey results showed a lack of competency in TB/MDR-TB services among nurses and other HCWs. • HCW knowledge on ART for pediatric patients is limited, with just over half of HCWs achieving scores reflecting competency in pediatric ART services.	• Given low rates of HCW competency in DS-TB, DR-TB, PMTCT, and ART services, particularly pediatric ART, mentoring for facilities should be strengthened in these areas. This may involve additional mentoring visits, and/or visits with a designated focus on the relevant knowledge and skills. • If funding allows, support additional training for HCWs, especially nurses and nursing assistants, in the

	• Approximately half of HCWs were not competent in PMTCT services.	provision of DS-TB and DR-TB, PMTCT, and pediatric ART services.
Objective 1	• In the area of M&E activities, the integration of the TB module and indicators into CMIS was identified as an area where additional work is needed.	• Continue to focus on integration of TB modules and indicators into CMIS, including the transition from paper TPT registers into electronic format. Until TPT registers are fully electronic, support improvements in data collection and monitoring for the existing TPT paper register system.
	• The percentage of facilities meeting TB/HIV performance standards was not able to be determined, since the standards were developed recently by another IP and have not yet been used to assess facilities.	• Once facilities have been assessed on the new TB/HIV performance standards, provide targeted mentorship to under-performing facilities to support the development of action plans to address performance gaps.
	• Early communication challenges with the NTCP limited collaboration between ICAP and the NTCP on some research activities, such as the TB Drug Resistance Survey.	• Moving forward, establish three-way engagement between ICAP, CDC and the NTCP. Clearly define roles and responsibilities and schedule regular communication among the three institutions.
	• Only one report on QI activities to inform TB and MDR-TB services has been produced to date.	• Continue ongoing QI work to address TB mortality rates. Ensure that reports summarizing lessons learned from all QI projects are written and disseminated to relevant stakeholders.
Objective 2	• Baseline assessment of the RHMT was not conducted, and metric to assess changes in RHMT effectiveness in stewardship and leadership was never developed.	• Implement systematic assessment of the RHMT using ICAP's district-level RHMT performance indicators: (1) Percent of planned RHMT meetings that were conducted, (2) Percent of RHMT meetings in which HIV service delivery data or other HIV-related data were discussed (3) Percent of RHMT meetings in which HIV quality improvement issues were discussed. Consider identification of additional specific benchmarks or indicators of RHMT leadership and performance that can be monitored and tracked over time. • Establish contingency plans for critical program activities, so that even if funding or other resources are unavailable, a modified or reduced version of the planned activity can be undertaken rather than delaying indefinitely. Timeframes should be defined for each critical activity, such that delays beyond a certain date trigger activation of the contingency plan.
	• KIs suggested that an increased focus on TB in REHSAR meetings would be helpful, and identified a need for more current, relevant indicators.	• Implement a routine review of ReHSAR indicators at regular intervals (for example, every other year), which will ensure that indicators are regularly assessed and updated as needed to align with current priorities. The next update may include strengthening the focus on TB-related indicators.
	• To improve regional M&E systems, capacitation of clinical staff to review their own data and assess the results would be helpful.	• Train and mentor health facility staff to routinely and independently (without ICAP/RHMT support) extract, collate, analyze and use their own TB/HIV data to review performance and develop QI plans as required.

	• Stakeholders in Manzini widely expressed concerns that private facilities were negatively affecting outcomes in the region.	• Consider ways to provide additional limited support (such as training) to private facilities in Manzini region. • Additionally, strengthening communication with the RHMT around this issue (what ICAP is and is not able to provide to private facilities, and discussion of concerns around the impact of private facilities on regional outcomes), may be beneficial.
Objective 3	• Testing coverage could not be assessed across all facilities at this time, since tracking of the number of testing-eligible clients is in the process of being implemented.	• Ensure that eligibility screening and risk assessment is conducted correctly together with collection of consistent data on the number of testing-eligible clients at all facilities as planned. Once tracking is in place, use data to target support to any facilities lagging in testing coverage.
	• Despite efforts to conduct more targeted testing in FY19, overall testing numbers remained relatively high while yield decreased, indicating that optimization of the HTS process could be improved. • Index case testing was identified as a key challenge requiring improvement: Less than a third of identified contact persons received testing in FY19, well below the target of 80%.	• Consider strengthening the quality of HTS yield measures by collecting data on re-testing status, which will allow for the exclusion of re-testers in yield calculations. • Investigate the current strategies in place for HTS yield optimization; this could include an evaluation of the targeted testing strategy/tools in use. Strengthening of current approaches, and/or the development of new strategies, may be needed. • This includes a continued focus on index case testing. A rapid assessment of the reasons for low testing rates of identified contacts may be useful – for example, is sufficient contact information being elicited from the index case to successfully reach identified contacts? Is there a lack of staff to carry out the testing of contacts? Have staff received adequate training on index elicitation and outreach?
	• The proportion of facilities initiating and retaining 90% of eligible clients on ART need improvement, especially for sub-populations with lower coverage rates (infants/children and adolescents). • VL testing coverage has been a challenge for the program, and though coverage has steadily improved to 76%, there remains room for improvement. Several KIs noted this, and emphasized that continued efforts are needed to maintain momentum. • Rates of overall viral suppression at ICAP-supported sites are high, and have nearly reached the 95% target. However, viral suppression rates remain lower among children and adolescents, reflecting a similar pattern in national outcomes.	• Identify specific ICAP-supported facilities that do not initiate ART for at least 90% of eligible adults, adolescents and children, and/or do not have ART retention rates of at least 90% for each of these groups and provide targeted TA, HR support and mentoring as needed to increase ART coverage. • Continue work to address ART coverage (see also the recommendation on ART, above) and VL monitoring for sub-populations (particularly children). This may include additional QI projects such as the one targeting infant ART initiation.
	• 76% of surveyed HCWs had been trained in IMAI, just under the training target of 80%. As with HCW training on other topics, staff turnover remains a challenge in achieving training coverage at health facilities. Staff	• Consider implementation of a training-of-trainers model in facilities, in which higher level staff are capacitated to train incoming staff on IMAI and other topics. Alternatively, more frequent trainings may be needed in

turnover at health facilities was repeatedly described as a major challenge in achieving training coverage.	order to ensure the presence of trained staff at facilities. • Strategies to support MOH in reducing staff turnover in facilities could also be considered. For example, encouraging the implementation of hiring criteria that prioritize employees likely to stay in a position long-term, and/or supporting facility management in efforts to improve employee satisfaction.
• The percent of patients screened positive for TB who received diagnostic testing has been inconsistent, particularly in earlier years, ranging from 33% to 100%, but has remained at 100% over the last year. • The percent of patients diagnosed with TB who received treatment was highly variable in FY17 and FY18, ranging between 29% and 97%, but throughout FY19 over 90% received treatment. • The number of patients initiating and completing TPT are just 29% and 27% of the FY19 targets, respectively; 80% of ART patients who initiated TPT in FY19 completed it. • The stagnant TB mortality rate was also identified as a remaining gap.	• Frequently monitor the percent of patients screened positive for TB who receive diagnostic testing and the percent diagnosed who receive treatment, to ensure that rates remain high. • Work with facilities to identify and address barriers to TPT initiation (the primary focus, as it has the biggest gap) and completion (where there is still room for improvement). Consider implementation of new QI initiatives at facilities to address this issue. Approaches may include such as assigning targets to each facility, implementing motivational interviewing for couples with intensive supportive supervision by clinical mentors to improve client informed decisions, and use of fixed dose combinations for TPT. • Continue ongoing QI work to address TB mortality rates, and scale up implementation of any successful strategies identified.
• Although the proportion of HEI testing positive remains low, the high percentage of HEI with unknown outcome at 18 months presents a challenge.	• Continue/increase support for lay staff and mentor mothers who support the implementation of early infant diagnosis, as well as follow-up of families to reduce the number of HEI with unknown outcome. • Mentor staff conducting follow-up to optimize tracking systems and identify the most effective strategies to reach clients. • Consider implementation of a QI project to address high rates of unknown outcome among HEI at 18 months.
• The integration of family planning services into HIV services remains a challenge, though it has occurred at 36 of 40 (90% of the 100% benchmark) ICAP-supported ART-initiating facilities.	• Work with facility staff to identify strategies to support FP service integration into HIV services, particularly at larger facilities such as hospitals. • Consider various approaches/levels of integration based on facility and patient needs, such as offering select FP services in the ART clinic, or simply creating a strong referral link to the MCH unit in the same hospital.
• The number of cervical cancer screenings conducted in FY19 was approximately half of the target number for the year. • 30% of those screening positive for cervical cancer in FY19 did not receive treatment.	• Ensure that sufficient supplies are available for cervical cancer screening at facilities; consider supporting additional staff to conduct screening at facilities if needed. Continue to support the rollout of screening to additional facilities. • Work with facilities to identify where patients screening positive for cervical cancer are lost to care, and develop and implement strategies to address this gap. At hospitals and clinics that have implemented a "screen and treat" approach, additional mentoring of HCWs conducting cervical cancer screening to provide

		cryotherapy may be needed. Increasing the capacity of facilities that provide LEEP services may be required to reduce the backlog and number of patients lost to care.

8.0   Dissemination Plan and Use of Data

The findings in this report have been shared with CDC and program leadership to inform priorities and activities in the final year of the program, as well as the implementation of future TB and HIV programs. The final report will be shared with stakeholders and will be made publicly available within 90 days of completion according to the PEPFAR ESoP.

9.0   References

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10.0   Appendices

Title	Document file
Appendix A. Program logic model	**PDF** Appendix A.
Appendix B. Evaluation framework	**PDF** Appendix B.
Appendix C. List of contributing stakeholder organizations	**PDF** Appendix C. List
Appendix D. Key informant interview guide	**PDF** Appendix D. Ke
Appendix E. Health care worker survey tool	**PDF** Appendix E. Hea
Appendix F. Conflict of interest statement	**PDF** Appendix F Con
Appendix G. Informed consent form for key informant interviews	**PDF** Appendix G.
Appendix H. Informed consent script for health care worker survey	**PDF** Appendix H.
Appendix I. Evaluation protocol	**PDF** Appendix I.
Appendix J. CV of Evaluators (Roles and Responsibilities)	**PDF** Individual roles a