MAKERERE UNIVERSITY

Partnership to Enhance Technical Support for Analytical Capacity and Data use in Eastern and Southern Africa (PERSuADE)

End of Initiative Report
August 2018 – December 2020

MAKERERE UNIVERSITY
SCHOOL OF PUBLIC HEALTH

Partner Institutions

University of Zimbabwe

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TABLE OF CONTENTS

List of Tables

List of Figures

Executive summary

Well thought through systematic analysis and routine review of available data at regular intervals is an essential part of the program performance evaluation and management cycle. It reveals gaps and successes in program implementations and also provides an opportunity for program managers to verify if the program is running as originally planned, assess performance, identify strengths and weaknesses, gaps and priorities, and adjust the program accordingly. Makerere University School of Public Health (MakSPH) in partnership with seven Universities in Africa (Universities of Nairobi, Kinsasha and Muhimbili in Eastern Africa, Malawi, Zambia, Zimbabwe and Witwatersrand in Southern Africa) was awarded a grant: Partnership to enhance technical support for analytical capacity and data use in Eastern and Southern Africa (PERSuADE). The partnership approach involved guiding and empowering the local Universities in each country to partner with and support their ministries of health in analysis and data use as opposed to MakSPH as one grant recipient institution conducting all the analyses across the 8 countries. The approach brought on board and utilized the capacities across all the 8 institutions in this partnership to conduct analysis, interpretation and dissemination of existing data to inform improvements in HIV, TB and Malaria programming.

PERSuADE was implemented in two phases and these were the inception phase and the implementation phase. The inception phase involved countries assessing the existing practices and gaps in data analysis and use, identifying the partners supporting data analysis and use, and developing a work plan for the implementation phase. Each country held a stakeholder's engagement meeting that involved officials from the Ministries of Health (MOH) and other partners engaged in data management, analysis and use. The data analysis and use gaps identified during this phase included; inadequate data analysis capacity particularly at subnational levels, lack of harmonized or integrated data capture systems, data quality challenges within the District Health Information System 2 (DHIS2), limited or no data reports from private health sectors, limited data use at the health facility/community level to improve outcomes; and limited capacity to generate and present data in easy to use formats by Ministry of Health (MOH) managers. Since the list of gaps identified was long, each university together with MOH and the partners went through a prioritization process, and work plans developed to guide the implementation of the priority analyses.

The inception phase was followed by the implementation phase, which involved working together with MOH and in-country partners to build sustainable systems and capacities for ongoing analysis and data use. This phase had three objectives;

Objective 1: Support National Programs to conduct key disease-specific analyses on a regular basis, and use of the results and analyses to drive actions towards improved program coverage, quality, efficiency and impact

A focal person within MOH served as the link between the University team and the MOH program (HIV, TB and malaria) or the Health Management Information System (HMIS) department. Countries conducted analytical capacity building through jointly analyzing and interpreting data with MOH program staff. Disease-specific indicators were analyzed and a total of 38 analytical outputs (17 in TB, 5 in HIV, 13 in malaria and 3 outputs cutting across the three diseases) were generated in the 2 years. Zimbabwe implemented 7 analytical outputs, Uganda and Tanzania 6 outputs each, Malawi, Zambia and Kenya 5 outputs each, and South Africa conducted 2 analytical outputs. Democratic Republic of Congo (DRC) joined the partnership in July 2020. The Universities conducted baseline assessments (Inception phase) and also assessed the impact of COVID-19 on HIV, TB and malaria

services. Analytical outputs were packaged with brief and concise information to promote the use of findings in programming by policy makers and were widely disseminated through periodical program reviews, Technical Working Groups (TWGs) and other meetings focused on data reviews. MOH staff were mentored throughout this process and in some countries, analysis routines were developed and shared with the programs to institutionalize analysis tasks. The joint activities between PERSuADE country teams and MOH were affected by the COVID-19 pandemic in 2020 when countries instituted restrictions to meetings and travel. However, country teams adjusted to virtual meetings to implement their planned activities.

Objective 2: Ensure building of solid, national institutional capacity for analysis and use of data available from multiple sources, including financial and human resources, health products, as well as resource allocation models

Under this objective, countries supported capacity building and dissemination activities with MOH officials. For example in Uganda, findings and recommendations from the Multi-Drug Resistant Tuberculosis (MDR-TB) analysis presented during a National TB and Leprosy Program (NTLP) organized workshop, that aimed to develop a new five-year strategic plan were integrated into the new plan. Uganda also supported the establishment of a national malaria data repository that has enabled sub-national analysis and guided risk stratification and interventions targeting following the guidelines of the new High Burden High Impact (HBHI) response. In Zimbabwe, analyses of the malaria Test, Treat, and Track (3Ts) were used by the National Malaria Control Program (NMCP) to inform The Global Fund application. In Tanzania, following the TB patient pathway analysis, the team adapted the TB data analysis training guidelines for the districts and health facility level staff. The trainings in Tanzania included basic analysis for TB indicators, retrieving, analysis of DHIS2 data, and interpretation of dashboards. The team in Malawi developed data analysis routines for the 3T pathway analysis that were integrated into the DHIS2 in addition to developing dashboards and scorecards. Implementation was again constrained by the COVID-19 pandemic especially in the last year. Countries adopted virtual technology tools such as zoom to disseminate findings from analytical outputs. However, internet connectivity challenges and the online mode of delivery of imparting practical skills may have compromised the effectiveness of virtual capacity building.

Objective 3: Enhance analytical capacity by supporting countries, in particular the MOH in institutionalizing regular data reviews and analysis at national and sub-national level

The initiative through its collaborating universities supported the institutionalization of analytical outputs generation during the implementation phase through; i) development of analysis routines, ii) incorporation of developed analysis into the program M&E frameworks, iii) programming of analytical outputs into dashboards for quick monitoring, and iv) mentoring program staff in data analysis and use. Analysis teams from the universities, MOH, and in some cases in-country data analysis stakeholders discussed the analysis plans, conducted analyses and interpretation of findings. All countries utilized staff from Universities to support the analyses, except Zimbabwe that utilized both the university staff and Masters of Public Health (MPH) trainees to support analyses in the MOH departments for the three diseases. This approach enhanced capacity building for trainees, MOH staff and helped to fast-track analytical outputs.

Conclusions and Recommendations

The initiative supported capacity building efforts in data analysis, and use of evidence in decision making at national and sub-national levels through the implementation of analytical outputs to address evidence gaps in HIV, TB, and malaria; dissemination of analytical outputs findings in various forums; and interpretation and synthesis of results to inform program improvement. The evidence was used by some countries to inform the development of their five-year strategic plans. If these efforts are sustained, countries will register improvements in the performance of the three disease programs on critical indicators and enhance

progress towards sustained control to contribute to elimination plans in the near future.

The initiative also supported institutionalization of the culture of data use in decision-making in HIV, TB, and malaria, at the national and subnational levels. The teams across countries were successful in engaging stakeholders during the inception and implementation phases although the extent of engagement was varied. This should promote ownership and sustainability of efforts in data analysis and use of evidence for program performance and improvement.

To conclude the 2-year PERSuADE initiative, a virtual meeting was held on 11th December, 2020 and was attended by all Partner universities and The Global Fund MECA team. The meeting was also attended by Dr. Michael Kayange, Program Manager for the Malawi National Malaria Control Program (NMCP), Dr. Daniel Kyabayinze and Dr. Damian Rutazaana from MOH Uganda. Each country presented their experiences on what went well, challenges and how their work contributed to improved programs. It was noted during the meeting that when analytical capacity and data use support was at subnational levels, it was limited to a few districts or regions. Countries desired to expand the capacity to cover other districts, however, they were limited by available funds. Since teams worked with MOH, we hope these efforts can be scaled up by MOH to other regions and districts. Partner countries noted that financial and human resources were not disease-specific especially at sub-national levels and were often overridden by national initiatives.

We recommend additional funding for a longer implementation period to sustain the gains and ensure continued engagement with MOH programs and other relevant stakeholders. Capacity building and routine data analysis should be strengthened to improve data quality and foster data use for decision making. Lastly, we recommend a deliberate effort to create a formal platform for shared learning across countries.

1.0 Background and Introduction

Makerere University School of Public Health (MakSPH) in partnership with six Universities in Africa were awarded a grant in response to The Global Fund Request for Proposals RFP No TGF-18-025: Partnership to enhance technical support for analytical capacity and data use in Eastern and Southern Africa (PERSuADE). The partner Universities include Universities of Nairobi and Muhimbili in Eastern Africa, Malawi, Zambia, Zimbabwe and Witwatersrand in Southern Africa. In July 2020, University of Kinshasa from the Democratic Republic of Congo (DRC) joined the initiative. The partnership involved Schools of Public Health or Statistics across the participating universities. MakSPH was the prime grant recipient and hosted a secretariat that coordinated activities of the initiative. The steering committee provided oversight for the PERSuADE implementation.

This report summarizes the achievements of the PERSuADE initiative during the inception and implementation phases between August 2018 – December 2020. The report is organized into six sections namely, i) a brief background to the initiative, ii) a summary of the inception phase iii) an overview of the implementation phase, iv) a summary of the initiative achievements during the implementation phase (May 2019 -December 2020), based on the three initiative objectives, v) modification to implementation plans, vi) challenges encountered during implementation and vii) Conclusions and recommendations

1.1 Initiative Goal

The overall goal of the partnership was to support Ministries of Health (MOH) in the eight countries to conduct analysis, interpretation and dissemination of existing data to inform improvements in HIV, TB and Malaria programming.

1.2 Objectives

The specific objectives were to:

1. Enhance analytical capacity by supporting countries, and in particular the MOH in institutionalizing regular data reviews and analysis at national and sub-national level;

2. Support National Programs to conduct key disease-specific analyses on a regular basis, and use of the results and analyses to drive actions towards improved program coverage, quality, efficiency and impact; and

3. Ensure building of solid, national institutional capacity for analysis and use of data available from multiple sources, including financial and human resources, health products, as well as resource allocation models.

2.0 Inception phase

The PERSuADE initiative was executed in two distinctive phases - the inception phase and the implementation phase. The inception phase began in September 2018 following the launch of the initiative in a face-to-face meeting organized by MaKSPH and held in Kampala, Uganda on August 21-22, 2018. All the universities in the seven countries participating in the network attended the meeting. The meeting was also attended by The Global Fund's Monitoring, Monitoring Evaluation and Country Analysis team (MECA) Team represented by Nathalie Zorzi. The Ministry of Health officials of Uganda, Dr. Daniel Kyabayinze the Deputy Programme Manager, National Malaria Control Programme, John Kissa, Ms Tsholofelo Adelekan from Gauteng Department of Health South Africa and Prof. Edward Kirumira, the Chairperson for the Uganda Country Coordinating Mechanism (CCM) also attended. In the meeting, each university made a presentation based on their initial observations of the status of data management and analytical capacity, the gaps, bottlenecks, and challenges in data analysis and use in HIV, Tuberculosis (TB) and malaria programs (Figure 1). The PERSuADE Secretariat, headed by the Principal Investigator Prof. Rhoda Wanyenze, briefed the team on the strategy for conducting engagement activities with MOH and other in-country stakeholders, and introduced the tools and checklists for this process. These included the partner mapping and gap analysis tool, an MOH and partner engagement checklist, inception phase draft work plan, inception report templates and the implementation phase work plan template.

After the inception meeting, MakSPH wrote to MOH top management in every country introducing the initiative and the university that would be in charge of the in-country implementation. The partner universities then followed up with meetings with program managers for HIV, TB and Malaria, Health Management Information System (HMIS) and Monitoring and Evaluation(M&E) staff of the three disease programs. Focal persons were identified by the different programs to work closely with PERSuADE teams to implement activities in each country. All countries proceeded to hold stakeholder engagement meetings drawing participants from MOH and other partners that support data management, analysis and use.

Several gaps in data analysis and use were identified. These included; inadequate data analysis capacity particularly at subnational

Country teams at the PERSuADE Inception Phase Launch Meeting in Kampala, Uganda 21st - 22nd August, 2018

levels, lack of harmonized/integrated data capture systems – District Health Information System 2 (DHIS2), data quality challenges within the DHIS2, limited or no data reports from private health sector, inadequate data disaggregation at sub-national/district, limited data use at the health facility/ community level to improve outcomes, unlinked data systems with no central repository for all data from routine care and surveys, limited data use at all levels in programming, limited capacity to generate and present data in easy to use formats by MOH top management or mid-level managers and inadequate coordination among in-country partners supporting data related activities.

All countries identified a fairly long list of priorities after the stakeholder engagement and gap analysis but were encouraged by The Global Fund and the MakSPH teams to prioritize analytical outputs based on available resources (funding and time for initiative implementation). Each team working with MOH and other in-country partners developed a SWOT analysis[1] and a list of prioritized areas for each of the diseases to be supported during the implementation phase. These priorities were presented at the post-inception meeting in Geneva on 13-14 December 2018 and further discussed with The Global Fund's MECA team. After this meeting, the teams refined the final analytical outputs to be conducted during the implementation period i.e., at least one analytical output every six months for each country (seven analytical outputs every six months overall) totaling to 28 analytical outputs over the 2 years of the implementation phase (Table 1). The overriding implementation strategy was to ensure MOH leadership and ownership of implementation. To ensure the realignment with other MOH activities, MOH focal persons were identified in all countries to serve as a link between PERSuADE and the three programs.

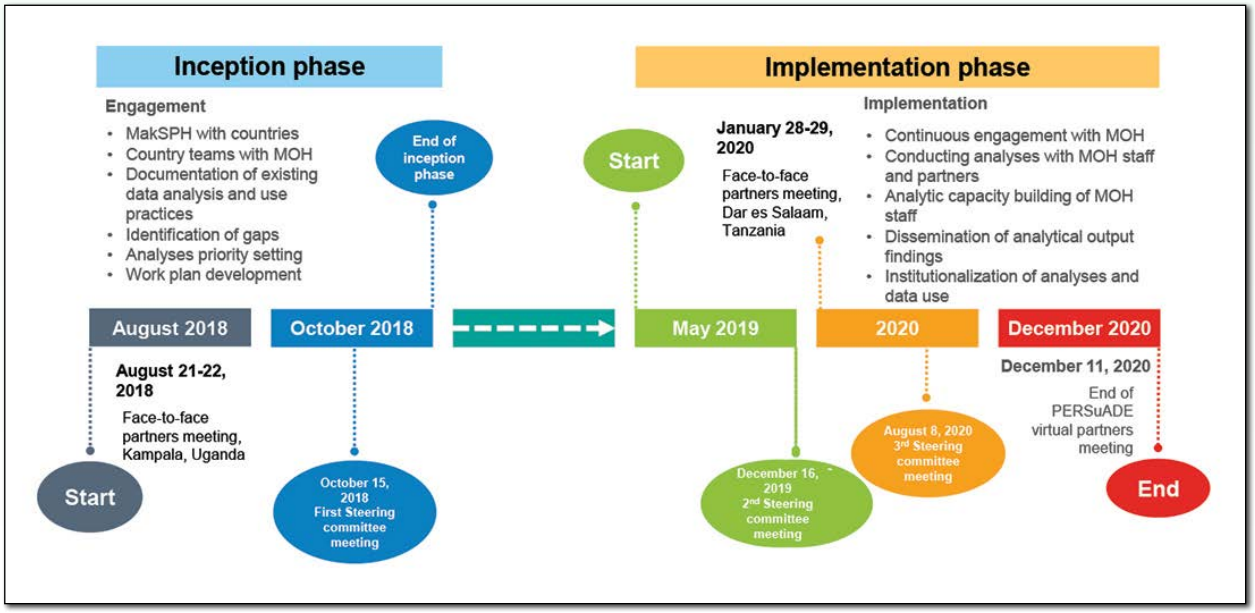


Figure 1: PERSuADE Timeline Chart with key milestones across the Inception and Implementation phases

1 Analysis of strengths, weaknesses, opportunities and threats.

3.0 Overview of implementation phase and approach used

The implementation phase was planned for the period November 2018 – December 2020 and was structured in four periods each lasting six months. Under this structure, each country was to implement at least one analytical output during the six-month period making it at least four analytical outputs per country, and a total of 28 analytical outputs by the end of the initiative cycle.

However, the start of the implementation phase was delayed by six months due to delays in signing of the agreement. To finalize the work within the implementation period, ending December 2020, a decision was made following a mid-term review meeting with The Global Fund in Dar es Salaam in January 2020 to scale down the number of analytical outputs from four to three for Kenya, Malawi, and Zambia, and to two analytical outputs for South Africa. The number of analytical outputs for Uganda, Tanzania and Zimbabwe were maintained at four since these countries had achieved faster progress with their analytical outputs. The outbreak of the COVID-19 pandemic in early 2020 not only constrained the implementation of activities but also affected the sector-wide accessibility and provision of HIV, TB and malaria services in all countries following the imposition of lockdown restrictions to curb its spread. In order to address the urgent needs by MOH in all countries to understand how the pandemic affected service provision, each country (except South Africa which experienced implementation challenges) was requested to take on at least one COVID-19 related analysis but all outputs were to be completed by December 2020. Table 1 summarizes the changes in analytical outputs agreed with The Global Fund for each country during the implementation cycle.

In July 2020, Democratic Republic of Congo (DRC) joined the initiative, led by the Kinsasha University School of Public Health. They conducted a baseline assessment and also evaluated the impact of COVID-19 on service provision for the three diseases.

The implementation approach adopted in all the countries involved engaging with MOH staff to identify priority areas for analysis to generate evidence to understand operational obstacles and inform program efficiency and improvement. Capacity building was a key pillar of the partnership and was conducted through jointly analyzing and interpreting the data with MOH program staff that were mentored and in some countries analysis routines were developed and shared with the programs to institutionalize analysis tasks. The joint activities were however affected by the COVID-19 pandemic in 2020 since most of the countries instituted restrictions to meetings and travel, and the teams had to adjust to virtual meetings. Analytical outputs were packaged with brief and concise information to promote the use of these findings in programming by policy makers and were widely disseminated through different channels including periodical program reviews, Technical Working Groups (TWGs), and meetings that involved data review. Guided by the reporting templates, every 6 months each country submitted a 2-3 page progressive report, a 3-5-page analytical output report, and power point slides for the analytical output. The quality of the reports varied from countries but were reviewed by the MakSPH secretariat, comments provided to countries so that their quality is improved before submission to The Global Fund.

To facilitate the engagement with MOH, a focal person - a member of the MOH M&E team was identified from each of the HIV, malaria and TB programs and the HMIS to work with the PERSuADE teams and served as a link between the University team and the MOH program.

Table 1: Summary of the changes in analytical outputs per country during the implementation cycle

Country	Original analytical outputs as of December 2018	Analytical outputs in entire implementation cycle, initially revised in January 2020 and later in May 2020 to include COVID-19 related analysis
Uganda	• TB Treatment cohort analysis • Malaria surveillance systems and impact assessment • TB case detection • Malaria cases and death trends analysis	• MDR TB trends analysis • Malaria Therapeutic Efficacy Study (TES) analysis • Space-time analysis of TB outcomes in Uganda during 2015-2019 • COVID-19 effect on TB services, access and uptake. • COVID-19 effect on malaria services provision • COVID-19 estimates, infection projections and impact of interventions.
Kenya	• TB Patient Pathway Analysis • TB case detection • TB Public Private-mix • Malaria cases and death trends analysis	• TB Patient Pathway Analysis • TB case detection • TB Public Private-mix • TB case notification in the era of COVID-19 • Malaria Test and Treat Analysis
Tanzania	• TB patient-pathway analysis • HIV cascade analysis • Malaria surveillance systems • Malaria impact assessment	• TB patient-pathway analysis • HIV cascade analysis • Malaria surveillance systems • Malaria Impact Analysis • The impact of COVID-19 on malaria services • Impact of COVID-19 on TB notification, MDR TB notification, and community contribution to TB notification
South Africa	• TB case notification and TB-HIV linkage • TB treatment cohort analysis • TB patient-pathway analysis • HIV cascade analysis	• HIV cascade analysis • TB treatment cohort analysis
Malawi	• HIV cascade analysis • TB case detection • TB treatment cohort analysis • Analysis of Test, treat and track (3T) pathway	• HIV cascade analysis • TB case notification and treatment cohort analysis • Analysis of Test, treat and track (3T) pathway • Trends in malaria testing, diagnosis and treatment amidst COVID-19 pandemic • The impact of COVID-19 pandemic on access to TB care

Country	Original analytical outputs as of December 2018	Analytical outputs in entire implementation cycle, initially revised in January 2020 and later in May 2020 to include COVID-19 related analysis
Zambia	• TB case detection • TB patient pathway analysis • TB treatment cohort analysis • Malaria surveillance systems and impact assessment	• TB case detection • TB treatment cohort analysis • Factors associated with TB positivity and cure rate • Malaria Test, Treat and Track (3T) pathway • Modeling excess deaths associated with malaria in the COVID-19 era.
Zimbabwe	• HIV cascade analysis • TB case detection and HIV linkages • Malaria surveillance systems and impact assessment • Analysis of Test, treat and track (3T) pathway	• HIV cascade analysis • TB case detection and HIV linkages • Malaria surveillance systems and impact assessment • Analysis of Test, treat and track (3T) pathway • Impact of COVID-19 on HIV services • Impact of COVID-19 on TB services • Impact of COVID-19 on malaria services
Democratic Republic of Congo (DRC)		• Baseline assessment inception report • Impact of COVID-19 on HIV, TB, and malaria service delivery.
Total number of outputs	28	38

4.0 Progress on initiative deliverables during the implementation phase (May 2019 - December 2020)

4.1 Re-engagement activities

Prior to the onset of the implementation phase, the teams in each country re-engaged with various MOH structures since there was significant time lapse between the inception and implementation phase with changes in the context and priorities. The re-engagement was intended to obtain consensus on prioritized analytical outputs approved by The Global Fund in the post-inception phase meeting. In some countries, MOH suggested adjustments to the approved analytical outputs due to other emerging needs. The engagement was followed by identifying relevant data sources and submitting data access requests to MOH. Subsequently, teams repeated this process before starting any six-month implementation period to ensure the proposed plans are supported by MOH and are relevant for program needs at the given time.

MakSPH held inter-country meetings of all partner countries every last Friday of the month to provide updates and share experiences between the teams to ensure that activity implementation is coordinated and harmonized to the approach set out in the work plans, and for learning across teams.

Every year, face-to-face meetings were held and attended by all teams across countries, Global Fund and other stakeholders. The first meeting was held in Geneva in December 2018, followed by a second meeting held in Tanzania in January 2020 and the last one was hosted virtually and organized by the team in Uganda in December 2020. During these meetings progress was reviewed, and feedback was provided on the analytical outputs implemented. All the institutions participating in the Partnership, members of the MakSPH Secretariat, representatives from The Global Fund, WHO, UNICEF, Health Information System Program (HISP) and Tanzania government officials, attended the mid-term meeting that took place in Dar es Salaam, Tanzania.

In the COVID-19 pandemic era, country teams used online virtual tools (skype, zoom) to meet with MOH to agree on analytical outputs, data access, discuss analysis plans, build capacity in data analysis and use, disseminate and interpret findings and generate evidence to guide decision making. The teams faced multiple difficulties due to the new norm of following COVID-19 guidelines that prohibited face-to-face meetings due to restrictions imposed on travel and physical gatherings. The MOH teams were also reassigned to other COVID-19 activities due to limited staffing, and scheduling of meetings with them was constrained. Below is a summary of MOH engagement activities carried out by each country.

4.1.1 Zimbabwe

In Zimbabwe, the team regularly engaged with the Ministry of Health and Child Care (MoHCC) through the Master of Public Health (MPH) trainees and the University of Zimbabwe Field Epidemiology Training Programme (ZimFETP) Director and Coordinator. The team held fortnightly meetings with MPH trainees attached to each of the three disease departments to follow up on the progress made on data access, analysis, presentation and dissemination. The team also met with the Deputy Director of the national TB unit and the GIS expert to agree on training needs and development of dashboards for analysis routines developed for TB indicators.

Zimbabwe: Meeting with National AIDS Council Management. From Right; Dr. Madzima-NAC CEO, Dr. Kabaya- MPH-PHO, Prof. Mufuta Tshimanga (Team Leader), Miss Tsitsi Juru –TA/ZImFETP and Dr. Gombe -RTC,AFENET

4.1.2 Tanzania

The Tanzania team re-engaged with stakeholders from the MOH, Community Development, Gender, Elderly and Children (MoHCDEC) and the President's Office-Regional Administration and Local Government (PORALG), as well as with the WHO HIV/TB focal persons. The purpose of these meetings was to provide updates to the stakeholders on the progress of the implementation phase, realigning the initiative activities with ongoing disease specific coordination and programmatic review meetings at subnational level, and request for data for subsequent analytical outputs. The Tanzania team met with MOH officials to discuss data access for selected indicators and seek their input to the developed TB patient pathway analysis training materials for sub-national level staff. The team also regularly met with the National AIDS Control Program (NACP) and National Malaria Control Program (NMCP) through the head of Strategic Information Units to obtain consensus on the HIV and malaria analytical outputs.

4.1.3 Uganda

Uganda held several meetings with the National Tuberculosis Program (NTLP) to agree on the approved analytical priorities. In addition to the approved plans, the NTLP team requested further analytical support to undertake subnational burden estimation to inform the new strategic plan development. The team also interacted often with the Director of the Department of Health information (DHI) and discussed quality issues in the data that had been analyzed and the possibility of customizing analysis routines into dashboards in DHIS2. They met regularly with the Division of Health Information (DHI) staff. Other meetings were held with National Malaria Control Program (NMCP) to agree on the analytical output to be implemented from a long list that had been suggested by NMCP staff. Other areas of support discussed were automation and capacity building for analysis routines recently developed for malaria program review, geospatial modelling and prediction, as well as capacity building for district biostatisticians and regional referral hospitals data managers. They also engaged the teams on data validation and cleaning, automation of the process to produce the reports and the feedback mechanism to district and facility level where data collection happens.

4.1.4 Kenya

In Kenya, the PERSuADE team held consultative meetings with MOH officials at national and subnational levels with disease specific program managers and researchers from medical institutions. The MOH officials included the Director General, Deputy Director General, heads of directorates and divisions (research and innovation, HIS, M&E, health policy planning and healthcare financing). Several consultations followed with HIV, TB and malaria program heads and their teams mainly with statisticians and health information record officers. The team worked closely with the National Tuberculosis, Leprosy and Lung Disease Program (NTLD-P) through the existing data analysis technical working group (TWG) composed of members drawn from the NTLD-P and PERSuADE with great support from the NTLD-P focal person i.e. Head of the Monitoring and Evaluation section. The team frequently engaged the National Malaria Control Program (NMCP), Division of Surveillance Monitoring, Evaluation and Operational Research (SMEOR) who was involved in conducting the malaria test and treat analytical output.

Kenya: PERSuADE's meeting with MOH Division of Monitoring, Evaluation and Informatics and Division of Health Policy and Research, 6th August, 2019 at Afya House, Nairobi.

4.1.5 Zambia

The Zambia PERSuADE team held meetings with MOH and the National Malaria Elimination Centre (NMEC), the program manager and the monitoring and evaluation team of the tuberculosis unit. A number of issues were discussed during the meetings including granting data access, harmonization on key analytical questions to inform program efficiency and improvement, capacity building plans, analysis approaches, and synthesis and use of evidence to inform program reviews. Further consultations were held with Program for Appropriate Technology in Health (PATH's), Malaria Control and Elimination Partnership in Africa (MACEPA), PMI/Program for the Advancement of Malaria Outcome (PAMO), Centre for Disease Control (CDC), World Health Organization (WHO), Family Health International (FHI) 360, and PATH's Eradicate TB, to reach consensus on analytical outputs for every cycle of implementation..

4.1.6 South Africa

In South Africa, the team engaged with the Gauteng Department of Health (GDOH) Management to inform them of the core focus of PERSuADE and deliberate on the process to access the HIV and TB service data from the District Health Information System 2 (DHIS2) and HIV data. The team also explored strategies to employ capacity strengthening of personnel involved in data analysis. Meetings were also held with the Health Information Systems Program (HISP) team to understand the DHIS2. This was to ensure buy-in, assess synergies and avoid duplication of efforts. The team further engaged with the GDOH to have access to HIV and TB treatment cascades data. However, the engagement at the national level was not successful despite the efforts of the province to introduce the initiative.

4.1.7 Malawi

In Malawi, the team reengaged with MOH and The Global Fund country coordination mechanism (CCM) to agree on prioritization of analytical outputs, training in DHIS2 and Spectrum. The team frequently held meetings with program managers for HIV and malaria. Most engagements were with the National Malaria Control Program compared to other programs. The engagement with the department of HIV and AIDS happened more frequently with lower cadres of staff in the M&E department than senior personnel. On the other hand, there was little contact with the National TB and Leprosy Program but whenever there was a need to contact the department, the team went through the focal person housed under the central monitoring and evaluation division, who was quite helpful. The team also worked with WHO and other partners that sit on the National Malaria Technical Working Group. There was a lot of engagement at subnational level most particularly the Mzimba and Nsanje district health teams.

4.1.8 DRC

The team in DRC rolled out the inception phase with an engagement meeting with MOH including the Permanent Secretary, among others. A stakeholder meeting was organized following the first meeting and attracted participants from the TB, HIV, malaria programs and other partners who support these programs. The status of data analysis and use was discussed and gaps were identified and consensus reached on the prioritization.

DRC: Stakeholders engagement meeting, 5th August,2020

4.2 Achievements in the implementation phase

All countries made good progress on the implementation plans inspite of the challenges posed by the COVID-19 pandemic during the last two reporting periods. This progress can be attributed to a number of factors including the existence of the centralized DHIS2 system in all supported countries that stores all routinely reported data, the reliable focal persons that provide timely feedback and the strong relationships established with MOH in most countries through constant engagement that helped ease the process of data acquisition. The COVID-19 pandemic restrictions and lockdowns affected countries at varying degrees. This affected the implementation of planned activities most especially capacity building, dissemination and engagement activities as most of the key MOH staff that country teams worked with were diverted to the COVID-19 response activities. As a result of the pandemic, some members of the PERSuADE teams were coopted into the country response activities to support evidence use in decision-making. The good progress despite the challenging COVID situation can be attributed to the strong relationship the universities have established with MOH through constant engagement. This engagement eased the process of data acquisition and use of the generated evidence in decision-making, the implementation strategy that was acceptable to MOH, and the dedicated staff in the teams who implemented this initiative in tandem with MOH. Most teams also spent the first half of the second reporting period (November 2019-April 2020) supporting the HIV, TB, and malaria programs in reviewing the performance of their current strategic plans, preparing new strategic plans and funding applications to The Global Fund.

4.2.1 Objective 1: Analytical outputs

The teams in all countries conducted the analyses that were prioritized during the inception phase. These analyses were conducted together with MOH staff in the three disease programs and the health information departments of MOH. This provided hands on support to personnel at the MOH, though this was mainly at the national level. Teams in countries leveraged existing review meetings and technical working groups (TWGs) to disseminate analytical outputs findings to inform decision-making.

In total, 38 analytical outputs (Table 3) were produced by the eight countries over the implementation phase in spite of the shortened implementation period and disruptions occasioned by the COVID-19 pandemic lockdown. Six countries executed at least five outputs in the entire period averaging almost two analytical outputs every six months. South Africa completed two outputs because of operational

challenges, and DRC which joined the initiative towards the end of the implementation phase completed 2 outputs. After every reporting period, these outputs were packaged in both report formats and slide decks and shared with MOH and GF.

Table 2: Analytical outputs implemented by each country per reporting period

Country	Analytical outputs implemented per period			Total number of outputs
	May – Oct 2019	Nov 2019 – April 2020	May – November 2020	
Uganda	• MDR TB analysis	• Malaria Therapeutic Efficacy Study (TES) analysis	• Space-time analysis of TB outcomes in Uganda during 2015-2019 • COVID-19 effect on TB services, access and uptake • COVID-19 effect on malaria services provision • COVID-19 estimates, infection projections and impact of interventions.	6
Kenya	• TB case notification and treatment outcome analysis	• TB Patient Pathway Analysis	• TB Public Private-mix • TB case notification in the era of COVID-19 • Malaria Test and Treat Analysis	5
Tanzania	• TB patient-pathway analysis	• HIV cascade analysis • Malaria surveillance systems	• Malaria Impact Analysis • The impact of COVID-19 on malaria services • Impact of COVID-19 on TB notification, MDR TB notification, and community contribution to TB notification	6
South Africa	• HIV cascade analysis		• TB treatment cohort analysis	2
Malawi	• Analysis of Test, treat and track (3T) pathway	• TB case notification and treatment cohort analysis	• HIV cascade analysis • Trends in malaria testing, diagnosis and treatment amidst COVID-19 pandemic • The impact of COVID-19 pandemic on access to TB care	5

Zambia	• TB case detection	• TB treatment cohort analysis	• Malaria Test, Treat and Track (3T) pathway • Factors associated with TB positivity and cure rate • Modeling excess deaths associated with malaria in the era of COVID-19	5
Zimbabwe	• Malaria surveillance systems and impact assessment	• HIV cascade analysis • TB case detection and HIV linkages • Analysis of Test, treat and track (3T) pathway	• Impact of COVID-19 on HIV services • Impact of COVID-19 on TB services • Impact of COVID-19 on malaria services	7
Democratic Republic of Congo (DRC)			• Baseline assessment inception report • Impact of COVID-19 on HIV, TB, and malaria service delivery.	2
Total	**7**	**9**	**22**	**38**

4.2.1.1 Zimbabwe

The Zimbabwe team implemented seven analytical outputs (Table 2), the highest number among all countries in the partnership. This success was mainly due to the strong preexisting collaboration between the University of Zimbabwe and MOH through the Zimbabwe Field Epidemiology Training program (ZimFETP) and involvement of students. In the Zimbabwe model, university student trainees are attached to the MOH to provide analytical support. All analyses were done at national and district level. The malaria surveillance systems and impact assessment analytical output were done for elimination districts and focused on the estimation of; i) the percentage cases notified within 24 hours, ii) percentage cases fully investigated, iii) percentage actively investigated & classified cases. This analysis also sought to describe the active foci of local transmission in the elimination districts to analyze the test, treat and track (3T) pathway with a focus on health facility and community interventions in the elimination districts in 2019 focusing on the following indicators; i) cases notified within 24 hours, ii) cases fully investigated and classified, and active foci of local transmission.

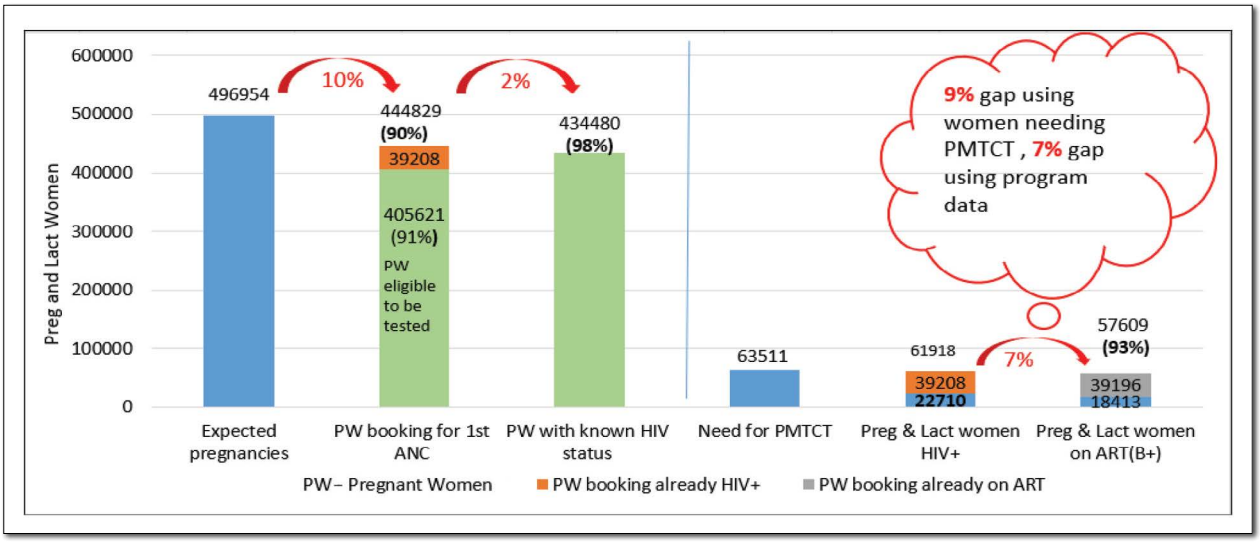


Figure 2: Zimbabwe National eMTCT testing and Treatment Cascade Jan - Dec 2019

The impact of COVID-19 on HIV, TB and Malaria services was assessed by comparing pre-selected indicators for the period January to June 2019 (pre-COVID-19) and January to June 2020 (COVID-19 period). The HIV analysis focussed on COVID-19 impact on the following indicators; i) Percentage of newly diagnosed people linked to HIV care (individual linkage to ART), ii) Percentage of people living with HIV currently receiving ART, iii) Percentage of HIV-positive pregnant women who received ART during pregnancy (PMTCT)(Figure 2), iv) Percentage of antenatal care attendees tested for syphilis (PMTCT), v) Percentage of HIV-exposed infants receiving a virological test for HIV within 2 months of birth (PMTCT), vi) Number of medical male circumcisions performed according to national standards (VMMC). For malaria, the COVID impact was evaluated on these indicators; i) Malaria incidence by province, ii) Proportion of confirmed malaria cases that received first-line antimalarial treatment at public sector health facilities, iii) Proportion of confirmed malaria cases that received first-line antimalarial treatment in the community, iv) Percentage of confirmed cases fully investigated and classified, v) Proportion of pregnant women attending antenatal clinics who received three or more doses of intermittent preventive treatment (IPT) for malaria. The TB indicators analysed for the two periods were; i) Treatment outcome; ii) Drug Resistant (DR) TB enrolment; and iii) TB/HIV linkage.

4.2.1.2 Tanzania

Tanzania completed six outputs. The TB Patient Pathway Analysis (PPA) sought to describe the steps patients with TB take from the initial point of seeking care to the point of achieving cure, TB diagnosis and treatment at various levels of the health system. The team was further requested by MOH to provide technical assistance to the NTLP to synthesize the outputs of the PPA and advise National TB and Leprosy Program (NTLP) on how the program can utilize the findings in their programmatic planning, how the subnational PPA findings could be used in program target settings and investment decision in The Global Fund proposal application, and how interventions should be prioritized in the different regions based on the results. The malaria surveillance system analysis focused on outcome-specific data of malaria infection for use in planning, implementation and evaluation of malaria control and elimination initiative, whereas malaria impact analysis aimed at providing information on how far the national malaria strategy is on a path to achieve the program targets of reduced malaria morbidity and mortality and interruption of malaria transmission. Several indicators were analyzed including; confirmed malaria cases and inpatient malaria deaths, case incidence, malaria mortality, parasite prevalence, test positivity rate and under-five mortality. The impact of COVID-19 on malaria services focused on the pandemic effect on trends of testing and confirmed malaria cases. The impact of COVID-19 on TB notification was intended to inform the TB program whether the COVID-19 pandemic had an impact on health seeking behavior for TB patients resulting into a number of cases

going undiagnosed and therefore untreated, and whether there was fueling of TB transmission among household contacts resulting from staying indoors together for extended periods. They also conducted an HIV cascade analysis among adults (+15 years) (Figure 3), children and adolescents (Figure 4).

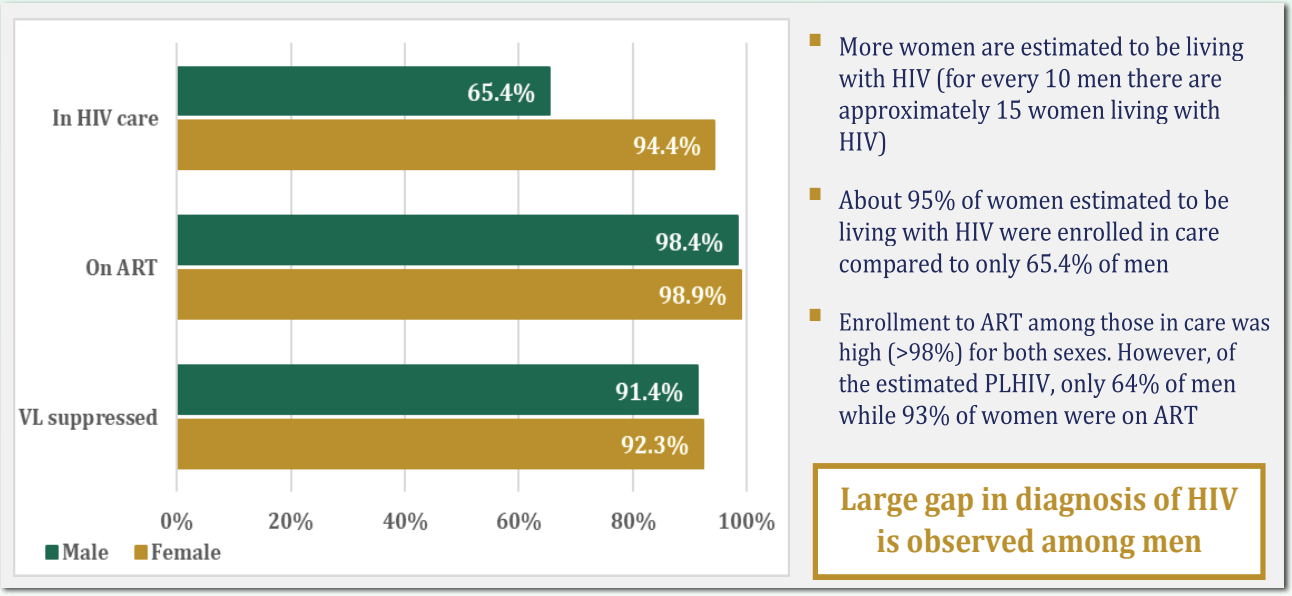


Figure 3: HIV treatment cascade by sex (Adults 15+), Tanzania

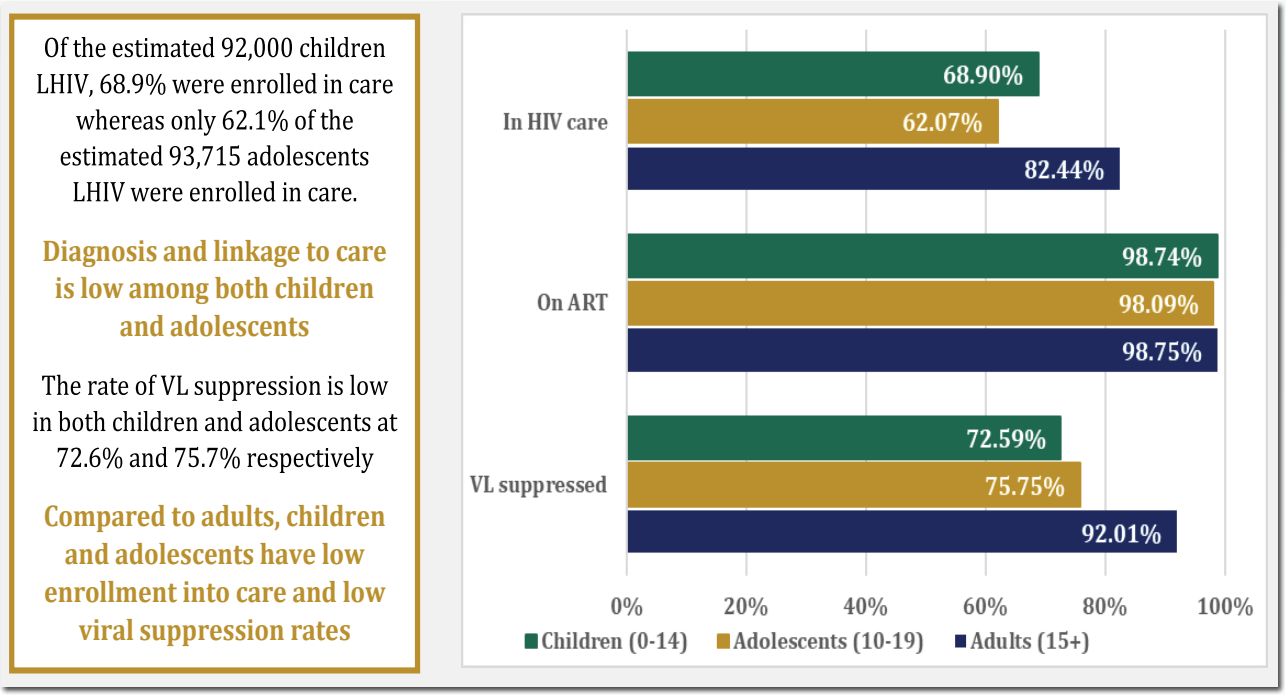


Figure 4: HIV treatment cascade by age (Children, Adolescents and Adults), Tanzania

4.2.1.3 Uganda

Uganda worked on six analytical outputs. The Therapeutic Efficacy analytical output was intended to determine efficacy and safety of artemether-lumefantrine, artesunate–amodiaquine and dihydroartemisinin-piperaquine for the treatment of uncomplicated plasmodium falciparum malaria in children in the country. This analysis was conducted using data from a previous study conducted by MOH and partners. The COVID-19 effect on malaria was assessed by comparing the following indicators during the periods January – September 2018, January – September 2019, January – September 2020; number of suspected cases, number tested, malaria cases per 1000, severe malaria cases per 10000, malaria related deaths per 100000, Proportion of confirmed malaria cases receiving recommended treatment, Test positivity rate, and reporting completeness. The impact of COVID-19 on TB services was assessed by comparing periods before and after COVID-19 on; presumed TB cases and new/relapsed cases per 1,000 suspected cases, TB screening, and new and relapse cases started on treatment (Figures 5-7). The TB treatment outcomes space-time analysis interrogated heterogeneities in TB treatment outcomes across regions and districts and over time and the factors associated (Figure 8). The indicators were analyzed at national level and disaggregated by region and district, gender and age. The PERSuADE team also supported the MOH HIV, TB and malaria programs in strategic planning, preparation of The Global Fund grant applications and customization of periodic reporting for the TB program. However, the planned capacity building activities were hampered by the COVID-19 situation. The team was further requested by National Malaria Control Division (NMCD) to carry out impact analysis during the malaria program review of the period 2014-2019 and stratification process to guide targeting of malaria interventions to fast-track malaria control and elimination targets.

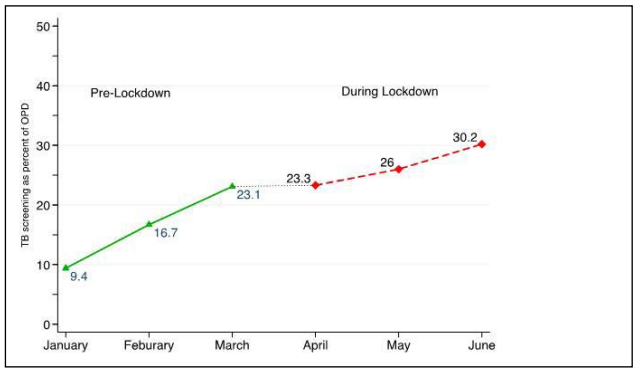


Figure 5: Trends in TB screening as a percentage of OPD attendance before and during the lockdown, Uganda

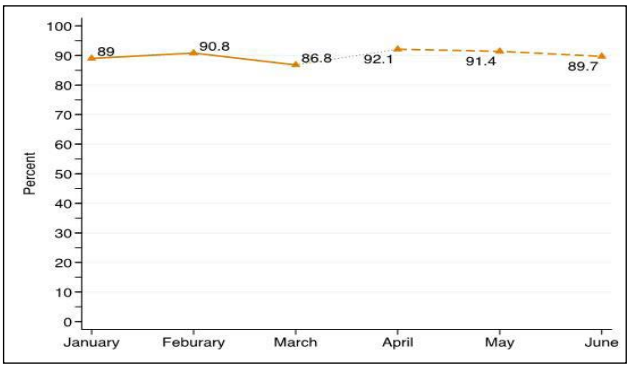


Figure 7: Trends in TB Treatment initiated among confirmed cases, January to June 2020, Uganda

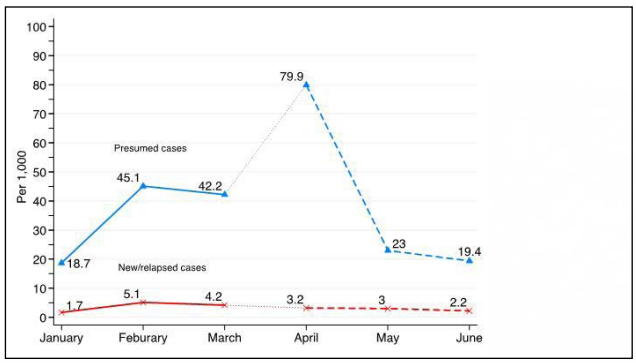


Figure 6: Trends in presumed TB cases, and New/ relapse cases as percent of TB screened, Uganda

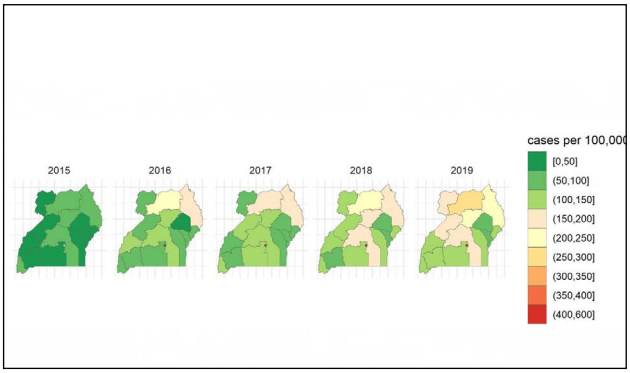


Figure 8: Regional TB notification Annual spatio-temporal trends 2015 – 2019, Uganda

4.2.1.4 Kenya

In Kenya, the team executed a total of five outputs including four in TB and one in malaria. In the TB case notification and treatment outcome analysis, several indicators were estimated including: TB prevalence rate per 100,000 population; TB incidence rate per 100,000 population; number of notified cases of all forms of TB; case notification rate of all forms of TB per 100,000 population; number of TB cases with Rifampicin-resistant (RR-TB) and/or MDR-TB notified; Number of TB cases (all forms) notified among prisoners; number of notified TB cases (all forms) contributed by non-national TB program providers (Figure 9); and percentage of registered new and relapse TB patients with documented HIV status and patients on ART during TB treatment. The TB Patient-Pathway analytical output was done using electronic data of 2018 and 2019 from TIBU (Kenya TB Surveillance system) database and was carried out in consultation with the NTLP team guided by the analysis methodology developed collaboratively and done for the national and sub-national levels covering four counties of Nairobi, Homa Bay, Kajiado and Samburu. TB case notification focused on comparing trends of TB case notifications in the early COVID-19 outbreak period to the same period in 2019, with a subnational interest in Mombasa and Nairobi counties. The TB Public-Private Mix analysis was done at national level assessing the performance of the private sector to the projected targets of the Kenya National Strategic Plan for TB, Leprosy and Lung Health 2019-2023. The Malaria Test and Treat analysis focused on the lake and coastal endemic zones in the country using DHIS2 data and the Malaria Quality of Care (QoC) Surveys.

PERSuADE-DNTLD-P skills training workshop on TB data analysis, interpretation and presentation, 12th August 2020 in Sandlewood hotel, Kajiado county, Kenya.

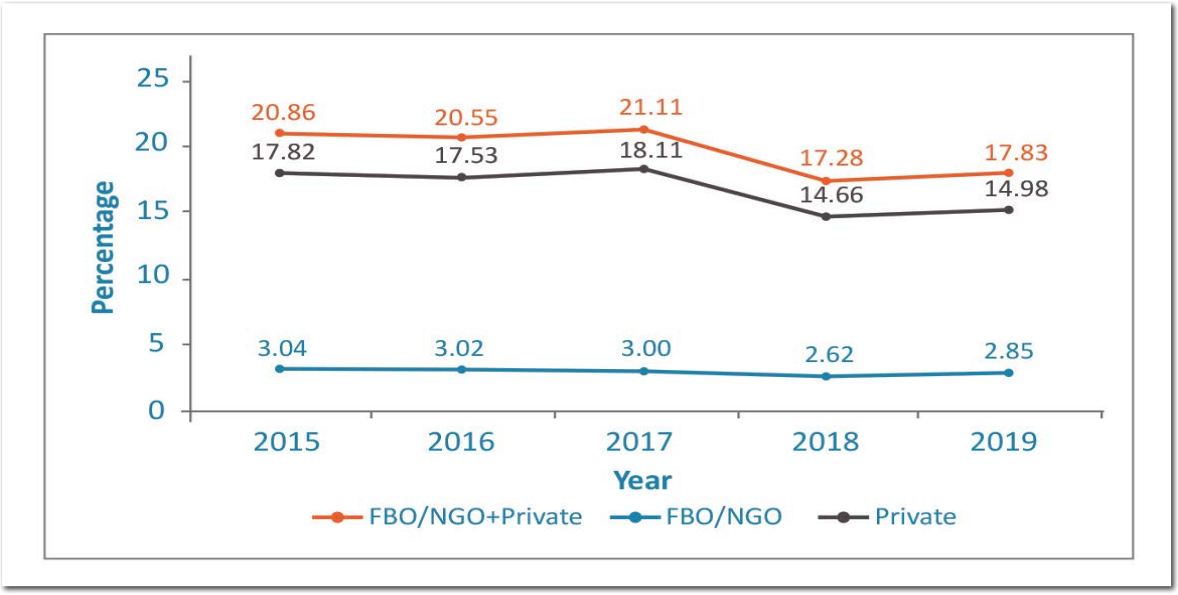
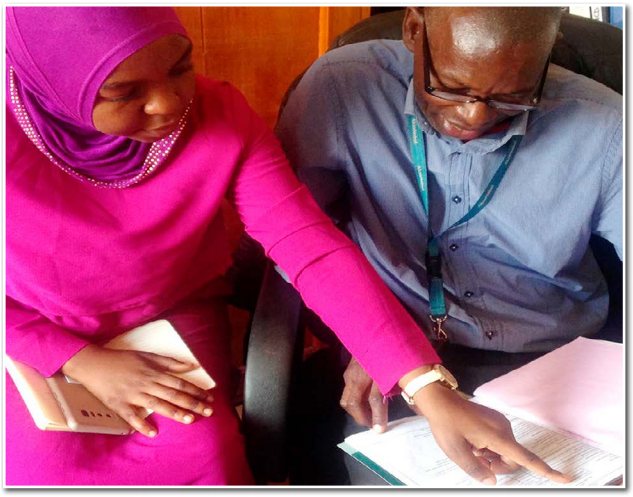


Figure 9: Proportion of TB cases notified by private sector 2015 - 2019 in Kenya

4.2.1.5 Malawi

The Malawi PERSuADE team completed five outputs. The malaria Test, Treat and Track (3T) pathway analysis covered the following indicators in five districts; i) reported malaria cases (presumed and confirmed), ii) confirmed malaria cases/1000/year, iii) testing coverage and quality, iv) malaria test positivity, v) proportion confirmed, and vi) malaria cases received first line treatment at public facilities. The TB case notification and treatment cohort analysis was disaggregated by age, sex and HIV status in addition to estimating the proportion of achieving cure or treatment completion by HIV status, age, sex, and the proportion with unfavorable treatment outcomes. A Malaria 3T Pathway Dashboard was created from this work in the national DHIS2 platform - an exercise which highlighted data inconsistencies and duplication of indicators. In the HIV cascade analysis, emphasis was placed on the following indictors; i) number of people who were tested for HIV and received their results during the reporting period; ii) Percentage of newly diagnosed people linked to HIV care (individual linkage); iii) Number of new HIV infections per 1000 uninfected population; iv) Number and percentage of people living with HIV; v) Percentage of people living with HIV currently receiving antiretroviral therapy; and vi) Percentage of adults and children with HIV, known to be on treatment 12 months after initiation of antiretroviral therapy. For the effects of COVID-19 on malaria, trends in malaria incidence per 1,000 persons per month (as a measure of disease burden), test positivity rate (a measure of community transmission intensity and self-selection into care) and treatment coverage (as a measure of health systems capacity to provide care) amidst COVID-19 were analyzed (Figure 10). In the TB output, the team assessed the impact of COVID-19 TB national level notification rates and disaggregation by age and sex, and on HIV testing and treatment in TB patients.



Malawi: Data analysis session in Mulanje District- PERSuADE Staff (left) and MOH Officer

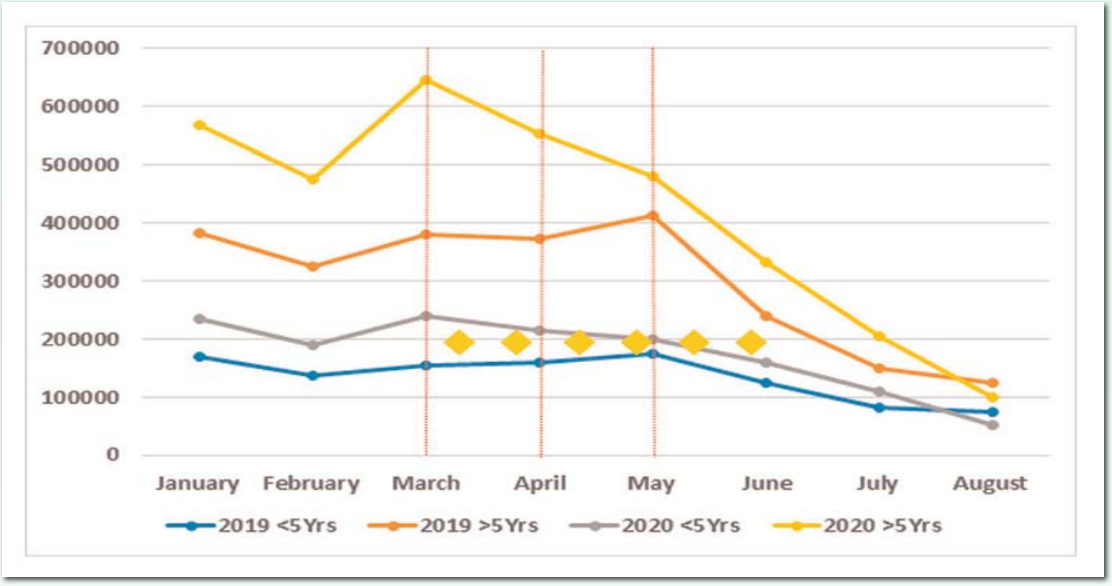


Figure 10: Confirmed Malaria cases from January to August in 2019 and 2020 in Malawi

4.2.1.6 Zambia

Zambia also delivered five outputs between TB and malaria. The TB case notification and treatment outcome analysis had emphasis on the following indicators; i) case notification rate of all forms of TB per 100,000 population-bacteriologically confirmed plus clinically diagnosed, new and relapse cases, ii) Treatment success rate of all forms of TB- bacteriologically confirmed plus clinically diagnosed, new and relapse cases. The malaria Test, Treat and Track (3T) pathway explored trends and disaggregated analysis in all the ten provinces in Zambia during 2013-2019 on these indicators; i) in-patient malaria deaths, ii) annual parasite incidence at subnational levels. The data was received from all the ten provinces in Zambia during 2013-2019. However, the track component of the 3T was left out as the country has yet to put a system in place to track patients.

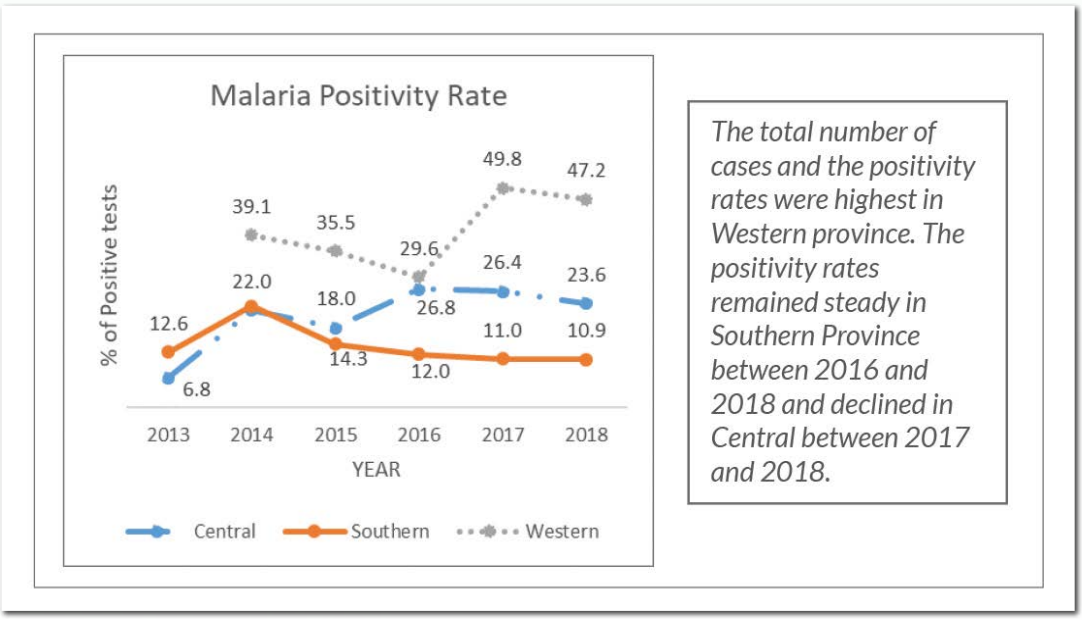


Figure 11: Malaria positivity Rates in Elimination Settings (Central, Southern and Western Province), Zambia

4.2.1.7 South Africa

Of all the initial seven countries in the PERSuADE network, only South Africa implemented less than four analytical outputs. The major reason for implementing only two outputs was the unsuccessful engagement process that affected implementation of the activities. The team experienced challenges with data access for much of the implementation period resulting in suboptimal progress. Although the top priority for the team was HIV cascade analysis, access to the individual data (Tier.Net) was delayed for over a year limiting analysis during the first implementation bloc to HIV testing, HIV positivity, referrals to care. Later when the individual-level data access was provided, the team analyzed the following indicators; Current HIV status, Isoniazid TB prophylaxis (IPT), TB status, TB/HIV co-infection and viral load suppression. Due to these challenges and eventually the COVID-19 restrictions, the analysis was done independent of Guateng Department of Health staff. Further analyses were conducted with TB data estimating the following indicators: the number of people assessed for TB symptoms; the proportion found with symptoms; proportion of those with symptoms that were investigated for TB; proportion that had confirmed TB; proportion of TB cases initiated on treatment; proportion initiated on treatment that were lost to follow up.

4.2.1.8 DRC

In DRC despite this period being consumed by inception activities, the team nevertheless managed to implement one analytical output – the impact of COVID-19 on HIV, TB, and malaria service delivery in health facilities and at community level in the four provinces of Kinshasa, Kongo-central, North Kivu and Haut-Katanga. Key indicators were assessed and compared during March to August 2020 and the same period in 2019 to see if the COVID-19 had impacted services delivery using DHIS2 data. These indicators were; the number of malaria cases confirmed and treated according to national policy; and the number of health facilities that had Rapid Diagnostic Tests (RDTs) stock outs; the number of new TB cases and relapses; the number of new HIV cases tested. For the community arm of the study, 382 households were selected and interviews conducted to establish the levels of knowledge of COVID-19, disease prevention, public perception, and the use of services during the pandemic.

DRC Validation meeting in Kinsasha, Gombe street of Cercle 414, 19th November, 2020

4.2.2 Objective 2: Progress on building of solid, national institutional capacity for analysis and use of data

Under this objective, countries supported capacity building and dissemination activities with MOH officials. Their implementation was constrained by the COVID-19 pandemic towards the end of the second implementation block. The major constraints included lockdowns and restricted travel which were imposed to slow down its transmission. This prompted teams to halt and postpone meetings when the lockdowns were imposed beginning March 2020. Some activities were conducted using online tools such as skype and zoom. The discussion and interpretation of findings generated from analytical activities and their implication on programming turned virtual for national level disseminations but suffered heavily at subnational levels because of the complete ban on travels in some countries or restrictions of face-to-face meetings. Most countries adopted virtual technology tools (skype and zoom) to disseminate findings from analytical outputs but Internet connectivity challenges and difficulty in teaching practical skills on-line compromised the effectiveness of virtual capacity building. Country specific details are presented below.

4.2.2.1 Zimbabwe

In Zimbabwe, the first analytical output results on malaria (malaria Test, Treat and Track (3T) pathway analysis) were shared with the malaria program head. These findings were used by the National Malaria Control Program (NMCP) to inform The Global Fund Funding application. The findings were also disseminated in the MPH monthly dissemination seminar, National Health Information Departments and the Directorate of Epidemiology and Disease Control. They were further presented during the AIDS and TB Programs departmental meeting and the Zimbabwe Field Epidemiology Training Program (ZimFETP) monthly meetings. The team also supported the national eMTCT pre-validation assessment in five provinces. At each site, data verification was conducted using health facility data and source documents. The reported numbers in DHIS2 were triangulated against recounts from available source documents at each site including laboratory reports and registers. The majority of the key informants at the visited sites expressed concerns about the lack of feedback from higher levels on the reports, which they submit monthly. Findings from this exercise were presented at a national feedback forum. The malaria analytical output was analyzed in collaboration with the NMCP data manager, the elimination coordinator and the assistant M&E officer. The results and recommendations were discussed with the NMCP director and other key NMCP staff and were utilized in decision-making. HIV analysis was done in collaboration with the M&E officers in the HIV department using validated data. The impact of COVID-19 on HIV services was shared with the Director and Deputy Directors at the AIDS and TB Unit. These results were also used by program managers to guide resource mobilization towards the resumption of discontinued services in the most affected sub-national areas and were also utilized in the production of the 2020 national cohort analysis report. The TB analyses were implemented with the TB M&E department to build data analysis capacity of the staff and to promote the culture of data use in the department. The results were presented at the national TB program departmental technical meetings and a number of recommendations have been made including; piloting of a tracker system for MDRTB patients to reduce loss to follow up and improve treatment outcome; servicing of motor bikes and capacitation of the sample transport system to ensure continuity of sample testing.

4.2.2.2 Kenya

In Kenya the team shared the first analytical output results (TB Patient Pathway Analysis) with the NTLP team and disseminated findings to a wider forum in the annual National TB Performance Review meeting held in Nakuru. In this meeting, the team engaged the TB coordinators from the four counties whose analysis results were included in the Patient Pathway Analysis (PPA) output. The second and third analytical outputs (TB case detection and TB Public Private-mix) were disseminated in a forum involving members from the Ministry of Health at national and county (sub-national) levels and other stakeholders including

Respiratory Society of Kenya (RESOK) and Komesha TB. The dissemination for malaria test and treat analysis was held in western Kenya targeting participants from the endemic zone counties.

PERSuADE Kenya presenting at the TB Annual Performance Review Meeting (PRM), 28th February, 2020, Sarova Woodlands, Nakuru

4.2.2.3 Tanzania

Tanzania adapted WHO training materials for the TB patient-pathway analysis for subnational structures and duly started holding dissemination workshops for health workers as well as program officers. However, these were cut short due to the COVD-19 pandemic travel restrictions. PERSuADE members also collaborated with the President's Office-Regional Administration and Local Government (PO-RALG), National AIDS Control Program (NACP) and NMCP officers to mentor health workers for disease specific program officers at the sub national levels in the analysis, interpretation and use of the second, third and fourth analytical outputs (malaria surveillance, malaria impact analysis and HIV cascade analysis, respectively). Training materials for the analytical outputs were developed and tailored to respective subnational levels. Trainees received hands-on training on calculation of indicators from the DHIS-2 database, their interpretation and use in planning, and performance of indicators for different facilities, councils, and regions and the implications of these differences. Furthermore, two dissemination workshops were conducted in close collaboration with NTLP, i.e., the PPA dissemination workshop and Sub-National TB Data analysis and Use training both targeting subnational areas of Pwani, Dar es Salaam and Morogoro. They were used to introduce the district TB focal persons and district medical officers to the PPA methodology, data sources and analysis, results interpretation and use in programming. For each indicator, participants generated dashboards from DHIS2-ETL database, interpreted and discussed reasons for deviations observed and recommended actions to be taken to improve program performance. The workshops were done as part of the TB program regional quarterly review meetings.

4.2.2.4 Uganda

In Uganda, the team presented findings from the first analytical outputs (MDR-TB analysis) in a workshop organised by NTLP to develop a new five-year strategic plan and to the WHO country office. These findings were well received and recommendations integrated into the revisions to the new plan. In preparation for the development of the new malaria five-year strategic plan, the team also supported NMCP to establish a national malaria data repository and conducted impact analyses to inform the malaria program review process as well as to assess progress towards attainment of set targets of the Uganda Malaria Reduction Strategic Plan (UMRSP 2014-2020). The data repository has enabled subnational analysis and guided risk stratification and interventions targeting as per guidelines of the new High Burden High Impact (HBHI) response. The team further supported the malaria strategic plan development mainly mathematical modeling to simulate the impact of different mixes of interventions to inform the most efficient and cost-effective intervention for deployment at subnational scale. The PERSuADE team members participated in various technical working groups (TWGs) for the three diseases and used these fora to promote data synthesis and interpretation of analytical output findings for program improvement. The team disseminated other malaria findings to the NMCP and stakeholders in several fora including the quarterly review, validation meetings, and grant application workshops. The team disseminated the malaria TES findings nationally to the Surveillance, Monitoring, Evaluation and Operational Research (SME-OR) technical working group comprising of the NMCP and all malaria programmatic and research supporting stakeholders in the country. The results indicated that the current first line drugs used in the treatment of uncomplicated malaria are still effective across the country. The TB space-time analyses were presented to the Program manager and later to the entire NTLP. The findings highlighted the disproportionate higher burden of TB among men, the elderly age groups and people living on islands. The latter observation was unknown to the program and interventions were proposed to start targeting this group.

4.2.2.5 Malawi

In Malawi, the team organized visits to districts to disseminate findings of the first analytical output (HIV cascade analysis) and promoted the use of findings in programming. Four teams successfully carried out the dissemination visits with varying levels of interactions with the districts. The HMIS office in conjunction with the District's Director of Health and Social Services coordinated the disseminations. The districts requested that the Village Mobile Clinics whose data is not part of the DHIS2 are included for the subsequent analyses to improve disease burden estimation. These meetings were also used as platforms for soliciting the districts' input into the second analytical output namely, TB treatment cohort analysis. The team also disseminated findings of the HIV cascade analysis at the district level and the reports were shared with the District Health Management Team and the Department of HIV and AIDS. The results for trends in malaria testing, diagnosis and treatment amidst COVID-19 were presented and shared with the NMCP, and during the College of Medicine virtual research conference. The report of the impact of COVID-19 pandemic on access to TB care in Malawi was shared with the national TB program. The key issues discussed included; under-reporting due to disruptions of treatment services by the COVID-19 pandemic, and inability of the DHIS2 to capture ART indicators due to use of outdated indicators.

4.2.2.6 Zambia

Zambia participated in two malaria control review workshops and also had a meeting with the National Malaria Elimination Centre (NMEC) together with officers from MOH where they presented the malaria findings and the process that generated the findings. Activities were severely affected by the COVID-19 pandemic restrictions on travel and in-person meetings, and therefore affected the scheduling and execution of data dissemination meetings. The team has also supported and participated in the annual malaria control review meetings

4.2.2.7 South Africa

The South Africa team engaged with the Gauteng Department of Health (GDOH) managers and staff to develop the approach to training and mentoring of staff in the analysis and use of HIV and TB data. This resulted in the drafting of an outline to guide the approach, which was presented to program leads. In the second implementation period all planned activities under this objective were not implemented in South Africa because the departmental health staff were occupied with supporting and leading COVID-19 response activities in the province.

4.2.3 Objective 3: Progress on supporting institutionalization of analytical outputs

The initiative has through its collaborating universities supported the institutionalization of the initiative analytical outputs during the implementation phase through; i) development of analysis routines, ii) incorporation of developed analysis into the program M&E frameworks, iii) programming of analytical outputs into dashboards for quick monitoring, and iv) mentoring program staff in data analysis and use (Figure 12). More country-specific details on the progress are discussed below.

4.2.3.1 Zimbabwe

The Zimbabwe team worked with the MOH to strengthen data analysis and use. MPH students from the university were allocated to each of the three disease programs to support analysis and dissemination of outputs at relevant forums. The students worked with the program managers and health information personnel to access, analyze data and package the analytical outputs into reports and slides decks. The outputs were adopted by the MOH departments for easy communication, consistency and development of analysis routines for the selected indicators. The team further developed data analysis routines for TB and incorporated them into the existing national TB program framework. Other meetings were held with the program managers and GIS experts in the ministry to see how best the three diseases analytical outputs can be added on dashboards for quick monitoring. Other meetings were held with The Global Fund team to discuss how the University can have a continued relationship beyond the PERSuADE initiative to ensure sustainability of the gains made in the last two years. Concept on supporting data analysis and use, conducting research and supporting scientific writing were developed and shared with MoHCC and The Global Fund. The Zimbabwe team thus contributed to addressing the limited human resource capacity identified prior to PERSuADE implementation that was a hindrance to data analysis and utilization in decision making.

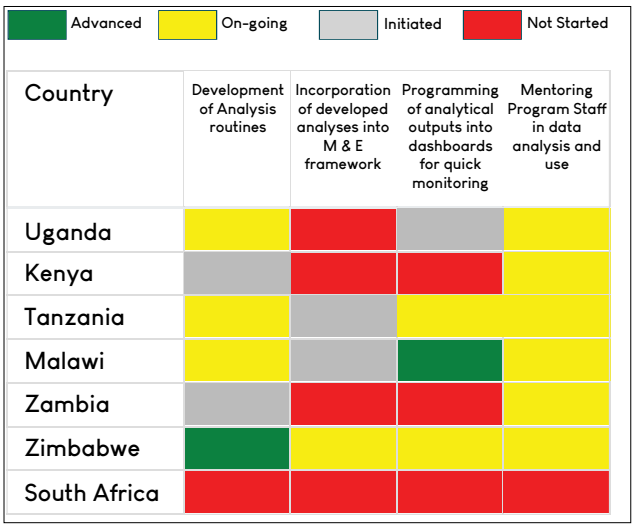
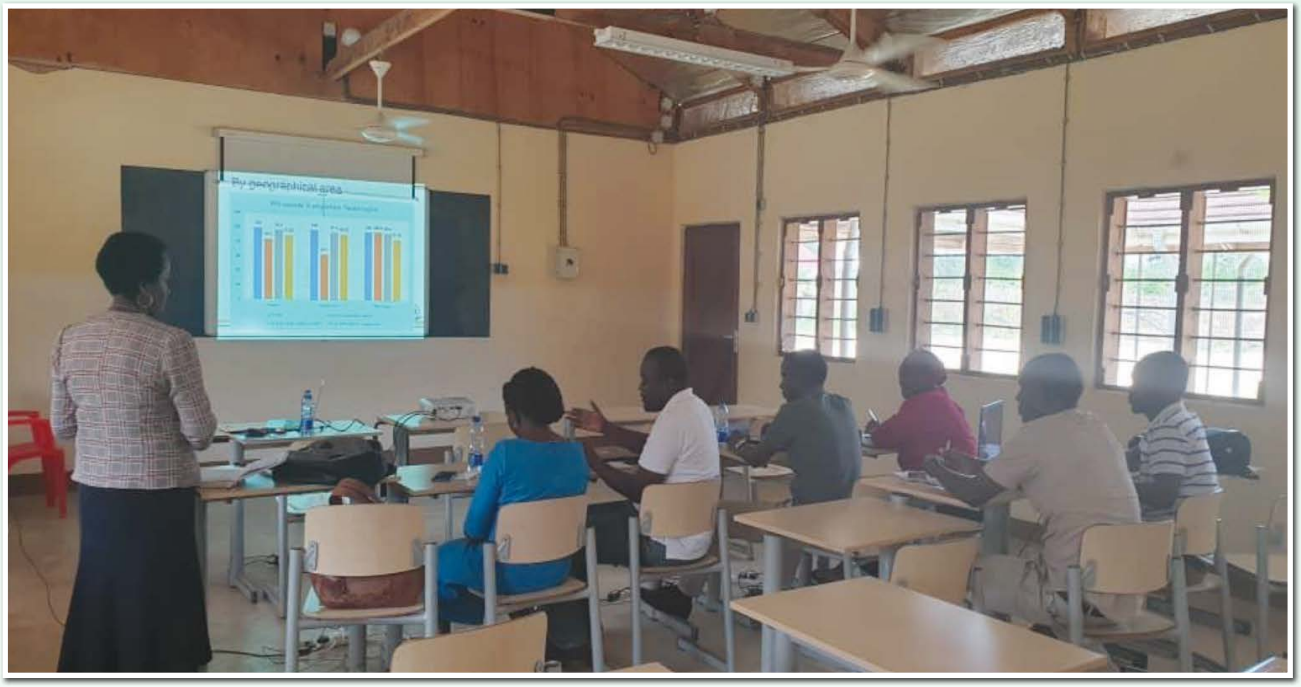


Figure 12: Heatmap on progress towards supporting institutionalization of analytical outputs

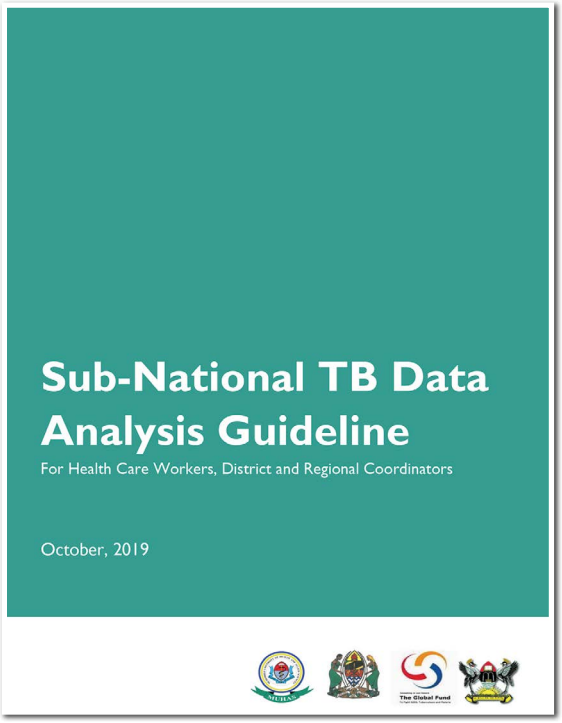
4.2.3.2 Tanzania

In Tanzania, the team worked with NTLP to adapt the WHO TB data analysis guide for health facility and regional teams. This need was raised by the MoHCDGEC who asked PERSuADE to develop a Sub-National TB data and analysis guideline for use in training of district and facility level staff on TB data analysis using DHIS2 data. This guideline will be used by all stakeholders to ensure consistency and quality training of the sub-national level staff as recommended by the President's Office-Regional Administration and Local Government (PORALG). This guideline was piloted during the training of Pwani and Dar es Salaam TB teams. Upon completion, the guideline will be used by the TB program for training all over the country during quarterly review meetings.



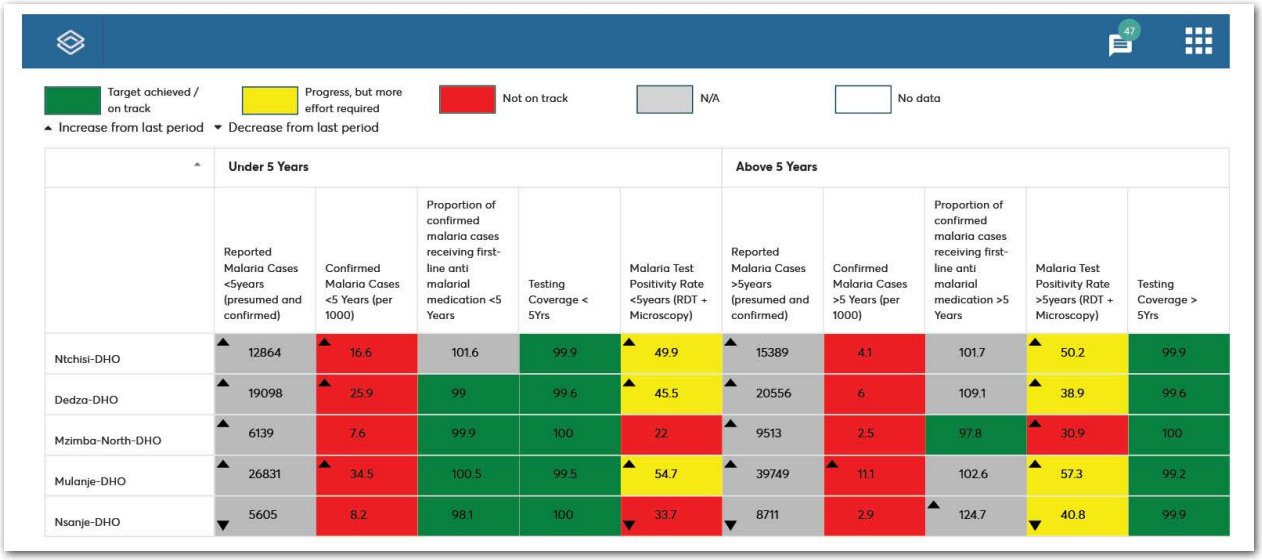
Prof. Rose Mpembeni (Team Leader) facilitating HIV cascade analyses workshop in Mkuranga, Tanzania

The team adapted the TB Data analysis manual to the district and Health Facility level staff based on the first analytical output findings. As part of fostering collaboration with MOH, PERSuADE participated in the Joint External Review of the National TB and Leprosy Program of their five year strategic plan that was coming to an end in 2020. The team also participated in the end term review of the supplementary Malaria National Strategic plan (2018-2020). In support of the MOH response to COVID-19 pandemic, the PERSuADE team participated in the national surveillance sub-committee. The team also provided technical support to the ministry in developing an active surveillance of COVID-19 suspected cases in drug dispensing outlets in Dar es Salaam. The PORALG and disease specific program officers from the MOH were involved in the subnational level MOH mentorship workshops and development of training materials. These national level staff were also involved in the discussion of measures needed to address the gaps observed in order to improve data analysis and use for the three diseases. Plans were discussed for scaling up of these capacity building endeavors to other regions and districts, which have not been supported in this phase of PERSuADE. Additionally, the team supported other activities including assessment of CTC data quality and ANC HIV surveillance which are all aimed at improving availability of quality data for use in improving health services and seasonal malaria chemo prophylaxis. The team has also supported the use of evidence (generated from the analytical outputs) in the annual TB/HIV review meeting, which was highlighted as a major gap at inception before implementation.



4.2.3.3 Malawi

The Malawi PERSuADE team worked with the HMIS department to promote data interpretation and use in programming in NMCP. The team further supported the creation of a malaria 3T pathway dashboard in the national DHIS2 platform. They developed data analysis routines that can be integrated into the DHIS2 in addition to the dashboards and scorecards that have been developed for the malaria Test-and-Treat analytical output (Figure 13) and the TB case notification and treatment outcomes. These tools are critical for analysis at national, sub-national and facility level and are expected to fill the data analysis gap beyond the initiative. A user manual was compiled to the MOH staff in operationalization of these tools. The team conducted a two-day training on how to use the dashboards and scorecards to ensure sustainable use and achieve institutionalization. The team also supported the reconfiguration of TB indicators on the national DHIS2 HMIS server that were lost when the server crashed during the reporting period. All this capacity was passed on to MOH program staff.



	Under 5 Years					Above 5 Years				
	Reported Malaria Cases <5years (presumed and confirmed)	Confirmed Malaria Cases <5 Years (per 1000)	Proportion of confirmed malaria cases receiving first-line anti malarial medication <5 Years	Testing Coverage < 5Yrs	Malaria Test Positivity Rate <5years (RDT + Microscopy)	Reported Malaria Cases >5years (presumed and confirmed)	Confirmed Malaria Cases >5 Years (per 1000)	Proportion of confirmed malaria cases receiving first-line anti malarial medication >5 Years	Malaria Test Positivity Rate >5years (RDT + Microscopy)	Testing Coverage > 5Yrs
Ntchisi-DHO	12864	16.6	101.6	99.9	49.9	15389	4.1	101.7	50.2	99.9
Dedza-DHO	19098	25.9	99	99.6	45.5	20556	6	109.1	38.9	99.6
Mzimba-North-DHO	6139	7.6	99.9	100	22	9513	2.5	97.8	30.9	100
Mulanje-DHO	26831	34.5	100.5	99.5	54.7	39749	11.1	102.6	57.3	99.2
Nsanje-DHO	5605	8.2	98.1	100	33.7	8711	2.9	124.7	40.8	99.9

Figure 13: Malaria Test and Treat Analytical output Scorecard, Malawi

4.2.3.4 Uganda

The Uganda PERSuADE team developed analysis routines for MDR TB and malaria program review analyses in Stata and shared them with the respective programs. The team engaged the Head of DHI to incorporate the DR TB and some malaria analysis routines into dashboards for quick monitoring. Several meetings that were held between the University team and MOH officials have emphasized linking of analytical outputs findings to program inputs. Members on the team actively supported strategic planning development for the three programs and use of findings from analytical outputs in programming. Additionally, the team participated in the following activities; i) organized a session to mentor the NTLP M&E team on the analysis of DR TB and other quarterly indicators, ii) participated in organizing the World TB Day celebrations, iii) A PERSuADE member participated in the Uganda TB Emergency Incident Management meeting where routine data from DHIS2 is reviewed from TB underperforming regions such as Lango and Karamoja, iv) developed a proposal on the effects of the COVID-19 pandemic on TB services delivery, access and uptake in Uganda, v) participated in malaria surveillance monitoring, evaluation and operation research (SMEOR) Technical working group meetings.

TB analytical output findings have been used operationally to improve TB programming in northern Uganda where the burden is disproportionately shouldered. The team further developed routines for data cleaning and analyses during the reporting period. The team has made plans to engage Health Information System Project (HISP) to incorporate these routines into dashboards. The later analysis routines for all the analytical

outputs were developed using R software for sustainability since it is open source and free unlike Stata. They were disseminated to the NMCP, NTLP and DHI staff and trainings to operationalize them were conducted. In addition, the team supported the two programs with the development and automation of their routine reports (weekly, monthly and quarterly). These were also shared but discrepancies were identified in indicator definitions and data elements used in analysis. The definitions were later harmonized and incorporated into the analysis and data cleaning scripts. The scripts can be used by DHI to automate the printing of anomaly reports that will then be sent to the district and facility staff to effect the corrections in the data. These tools are a new innovation by PERSuADE and are meant to address the culture of low data utilization and lack of expertise to make use of existing data in programming by making the process of analysis quick and easy to carry out, display visualizations to show long-term trends, and disaggregated analyses to identify groups and areas that need prioritization.

4.2.3.5 Kenya

The Kenya PERSuADE team participated in the review of a one-week training curriculum aimed at equipping personnel handling TB data at the subnational levels with analytical skills to enable them to conduct basic analysis and use their data for decision making. The team also supported the validation of baseline findings from a WHO supported project (Heightening Institutional Capacity for Government use of Health Research (HIGH-Res) aimed at strengthening institutional capacity to facilitate improved government use of health research in decision making. The PERSuADE team with the National TB and Leprosy Division held a data analysis and use capacity building meeting for Kajido county and sub-county TB personnel to improve their skills in data analysis and use for decision making following the gaps identified during the national TB Performance review meeting.

4.2.3.6 Zambia

Zambia disseminated its first analytical output results in a workshop for MOH malaria and TB programs. But some activities under this objective could not be executed as scheduled due to the delayed access in getting approval to use the data from the ministry and the COVID-19 pandemic. Also, the data obtained for the analysis of test, treat and track (3T) pathway output lacked the data on the track which compromised the depth of the analysis and subsequently undermined the recommendations for dissemination. The team carried out some workshops for capacity building for MOH malaria and TB M&E teams, but some were not implemented due to the COVID-19 pandemic disruptions.

4.2.3.7 South Africa

South Africa held meetings with the Gauteng Department of Health (GDOH) to discuss a curriculum for data analysis and use. Other follow up meetings were held with the department HMIS team but implementation was postponed to a later date due to a busy schedule of the department's staff. Also, the team held a harmonization meeting with a USAID implementing partner - ANOVA - that assists the province in analyzing data using the DHIS2 dashboard. The team also supported the COVID-19 response in the province and the team leader led the DOH Research and Evaluation Group on COVID-19.

5.0 Modifications to the implementation phase activities

5.1 Crosscutting

The initiative implementation phase was shortened from 24 months to 20 months (up to December 2020). Following consultation with The Global Fund during the Dar es Salaam meeting, all countries revised their work plans to realign activities to fit within with the implementation period. Zimbabwe, Uganda and Tanzania maintained the same four analytical outputs, but the rest of the countries scaled down the number of analytical outputs.

The COVID-19 pandemic starting in March 2020 affected all activities that required face-to-face meetings such as dissemination workshops and travels to meet with district officials and health facility staff in all countries. As the pandemic spread, MOH coopted some of the PERSuADE team members into the COVID-19 response in Uganda, Kenya, Zimbabwe, Zambia and South Africa to support epi analysis and decision making on the mitigation measures to curtail the effect of the pandemic on the health system. With the exception of South Africa, all countries conducted additional analytical outputs to assess the impact of COVID on HIV, malaria and TB programs.

The COVID-19 pandemic caused disruption to service delivery as indicated by the findings for COVID-19-related outputs on HIV, TB and malaria program activities. In all countries there was a significant decline in indicators analyzed during March-July 2020 compared to the same period in the previous years. The biggest declines in service delivery indicators were observed in the second quarter of 2020 due to lockdowns that were imposed towards the end of the first quarter in most countries. The continuing pandemic poses a threat to 2030 targets of sustained control and elimination of the three diseases. Therefore, there is a need for MOH to resume and enhance affected services in a structured way and to identify and scale-up innovations to mitigate the disruptions as the countries face the second wave of the COVID-19 pandemic.

5.2 Country-specific adjustments to the planned activities

Across all countries, there were adjustments to the prioritized analytical outputs due to the changes in the context and priorities. The COVID-19 pandemic also presented new challenges and needs that necessitated adjustments. Below is a description of the country-specific adjustments.

5.2.1 Tanzania

In Tanzania, the MOH and the team decided to focus their activities on five districts instead of national level as previously proposed at inception. These districts are; Mvomero DC, Morogoro MC (Morogoro region), Mkuranga, Bagamoyo (Pwani region) and Kigamboni (Dar es Salaam region). At the start of implementation phase, Tanzania deferred working on HIV cascade analysis to a future date in preference for a malaria analytical output due to the non-availability of the HIV M&E program officers at the time. The HIV analytical output was instead implemented in the second implementation bloc. The HIV program requested the team to add index elicitation and the testing cascade onto the HIV cascade analysis. The team could not work on the index elicitation output as earlier proposed because the HIV control program could not avail the index testing data set on grounds that it was not yet ready for analysis. In addition to implementing some pending activities from the last reporting period, due to COVID-19 disruptions, the team also worked on two more new analytical outputs i.e. the impact of COVID-19 pandemic on selected malaria and TB indicators.

5.2.2 Uganda

In Uganda, the need to address urgent questions that came up during the strategic plan development process and additional analysis requests were proposed by the three programs beyond the approved analyses agreed upon during the stakeholders' engagement meeting.

These were accommodated to support decision-making although they were not on the original priorities. Uganda also postponed several capacity building activities that were targeting subnational level staff (district biostatisticians and data managers at regional referral hospitals) and dissemination activities due to the lockdown restrictions to combat COVID-19. The team also later modified its plans to integrate support for quantification of COVID-19 supplies and predictive modeling to support COVID-19 intervention development. The team also used predictive modeling for forecasts of malaria outbreaks to assess the COVID-19 effect on malaria and TB services.

5.2.3 Zimbabwe

Zimbabwe put on hold GIS trainings due to the COVID-19 outbreak restrictions on meetings and workshops. In February 2020 the Zimbabwe government banned all meetings of more than 50 people in one place. This intervention was later followed by imposition of a total lockdown in the country, which affected the planned activities.

5.2.4 Kenya

In Kenya due to COVID-19 pandemic that led to the prohibition of travel and physical meetings, the team stopped involvement of sub-national personnel in the analysis process as a way of building their capacity, as had been envisaged in the work plan. Two additional analytical outputs were included with the COVID-19 outbreak i.e., TB case notification in the era of COVID-19 and malaria test and treat analysis on top of the TB public-private mix output.

5.2.5 Zambia

In Zambia some activities could not be executed on time due to the delayed access and approval to use the data from the ministry. The data obtained for the analysis of test, treat and track (3T) pathway output also lacked the data on the track which compromised the depth of the analysis. Additionally, activities could not be executed on time due to the delays caused by the pandemic and bureaucracy in obtaining data access authorization.

5.2.6 Malawi

Malawi decided to start with malaria and conduct the HIV cascade analysis later due to delays in accessing HIV data.

5.2.7 South Africa

The South Africa team conducted analysis themselves before training the GDOH staff because the department delayed to select staff for training.

6.0 Challenges during the implementation phase

Throughout the initiative cycle, countries encountered various challenges. Some challenges were crosscutting while others were country specific as discussed below.

Data access delays: Initially several country teams reported delays in obtaining access to DHIS2 database and other sources which resulted in delays in execution of analytical outputs. This was partly related to the initial delays in the reengagement and changes in leadership in the MOH top management in some countries (e.g. Kenya and South Africa). This required holding stakeholders' engagement meetings for a second round. Data access for most countries became less stringent for subsequent analytical outputs. On the other hand, teams that had strong pre-existing relationships and efficient in-country structures and processes with MOH such as Uganda, Zimbabwe, and Tanzania did not encounter major challenges in access to data. These challenges also eased subsequently for several countries except South Africa and Zambia, and to a lesser extent Malawi.

COVID-19 pandemic outbreak: The most important obstacle in all countries to the initiative was the outbreak of the COVID-19 pandemic, which happened towards the end of the second implementation period. This initially hampered the planned meetings and restricted movements but later extended to total lockdowns in all countries except in Tanzania. It was not possible to hold physical interactions with the MOH staff, which led to delays or cancellation of some capacity building and dissemination activities in the second half of the first year. Later when teams adapted to the use of on-line tools for virtual meetings, engagement at national level improved but not at subnational level where intermittent internet and power connectivity and a lack of computers undermined the use of zoom and skype for meetings. The COVID-19 pandemic affected the capacity building plans, which led to the omission of most of the personnel at the sub-national level. MOH officials got preoccupied dealing with the pandemic and were inaccessible for the PERSuADE activities.

Staff turnover: The change in MOH top leadership in some countries affected the momentum as the teams had to reengage the new officials and delays in the necessary approvals. The restructuring and redeployment of national MOH staff also led to institutional memory loss and necessitated reintroduction of the activities and initiative objectives to enable familiarization leading to a delay in data access.

Intermittent internet connectivity: Internet and Power outages most especially at subnational level caused delayed connection to DHIS2 data and downloading of the necessary data thus paralyzed work.

Inadequate data analytics officers: The trained officers are overstretched given the many demands of data analysis, use and reporting of which they are tasked with on a routine basis.

Irregular meetings with ministry of health: The lack of regular meetings in some countries at all levels, national, provincial, district on data analysis hindered timely dissemination of analytical outputs for informed decision making. Lack of regular meetings was compounded by many competing activities within the departments.

The current state of DHIS2 is not suited for elimination surveillance: For countries that reported on malaria elimination activities, the data on malaria cases notified within 24 hours was not available in DHIS2 as it is not routinely collected.

Lack of public/private integration: The DHIS2 data for all partnership countries is largely from public surveillance due to weak regulation of the private sector and this resulted in data collected from the private sector not being included in the analyses.

7.0 Conclusions and Recommendations

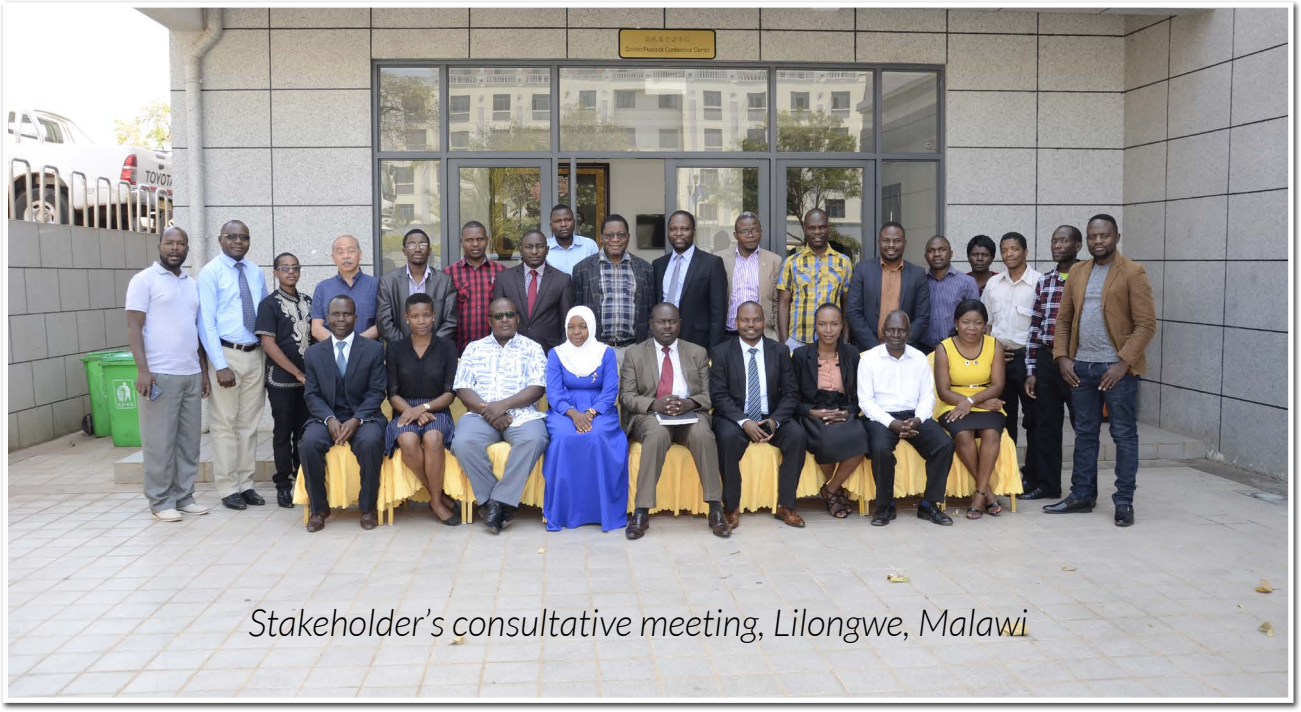
The PERSuADE initiative has supported capacity building efforts in data analysis and use of evidence in decision making at national and sub-national levels in the supported countries through the implementation of analytical outputs to address evidence gaps across the three diseases; dissemination of analytical outputs findings in various forums; and interpretation and synthesis of results to inform program improvement. The evidence was used by most countries in informing the development of the five-year strategic plans. If these efforts are sustained, we expect these countries to register improvements in the performance of the three programs on critical indicators and enhanced progress towards sustained control to contribute to elimination plans in the near future.

The initiative also supported institutionalization of the culture of data use in decision-making across the three targeted diseases, at the national and subnational levels. The teams across countries were successful in engaging stakeholders in the initiative design and implementation although the extent of engagement was varied. This should promote ownership and sustainability of our efforts in data analysis and use of evidence for program performance.

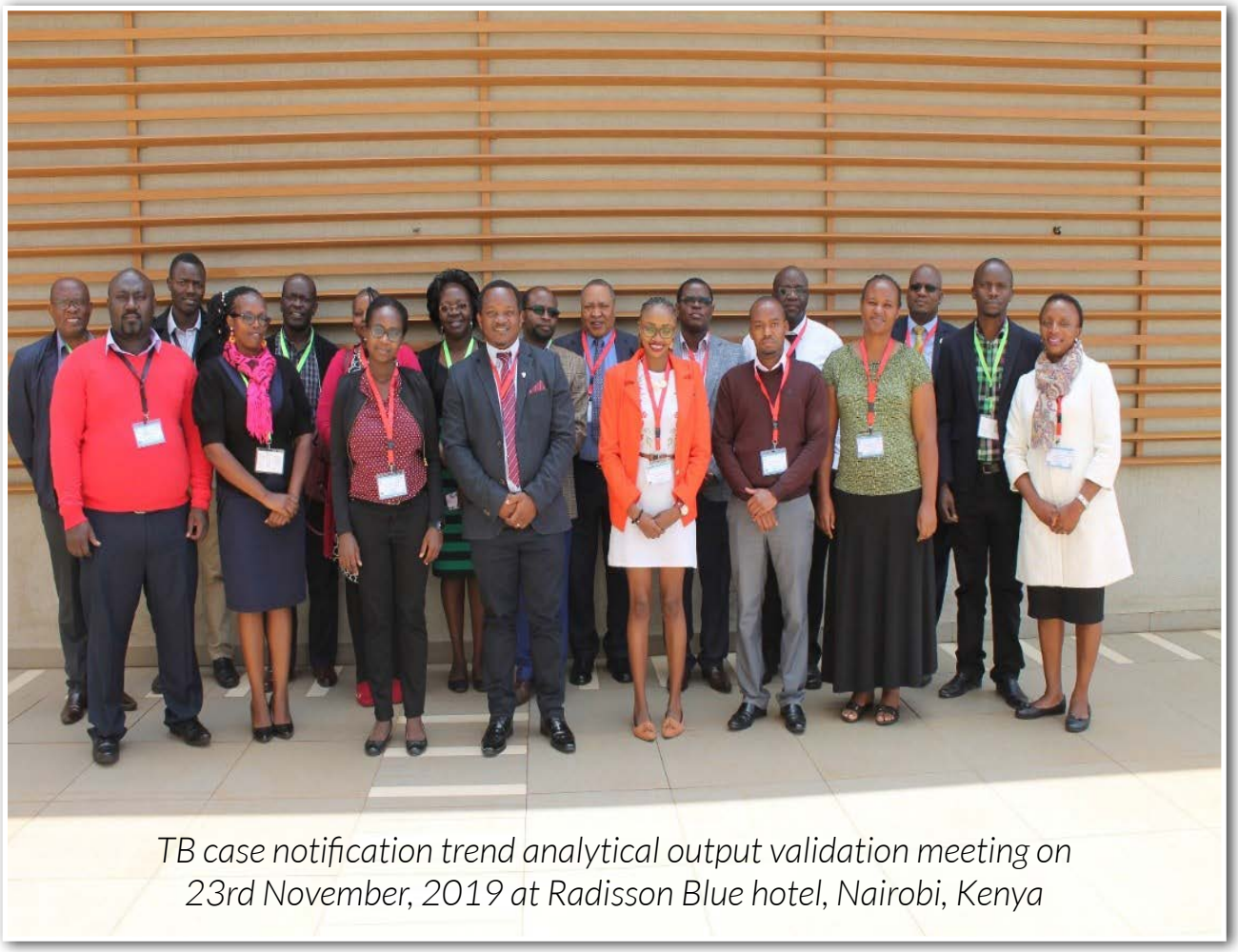
The following should be considered to sustain the gains that have been achieved in phase I of this initiative;

- Additional funding support to the initiative with a longer implementation period in order to ensure more meaningful engagement with the MOH programs and other relevant stakeholders.
- The PERSuADE teams across countries should plan for adequate time for capacity building and dissemination activities and support for some follow-on actions based on the findings.
- A request to the ministries for data access to support all prioritized analysis should be placed upfront and access granted for all outputs to minimize the loss of time between analytical outputs, ensure timely completion and implementation of adjustments to the programs
- In the next phase, the initiative should strengthen the capacity building component of the initiative both at the national and subnational level to improve data quality and foster routine analysis and use for decision making
- The initiative should also support activities for peer-to-peer learning across participating countries. There is need for a formal platform for exchange of experience and lessons between countries.
- Explore measures for in-country sustainability of the analytical capacity gains registered by the initiative including having systems that are adaptive to COVID-19 and other similar circumstances.

Group Photo Gallery



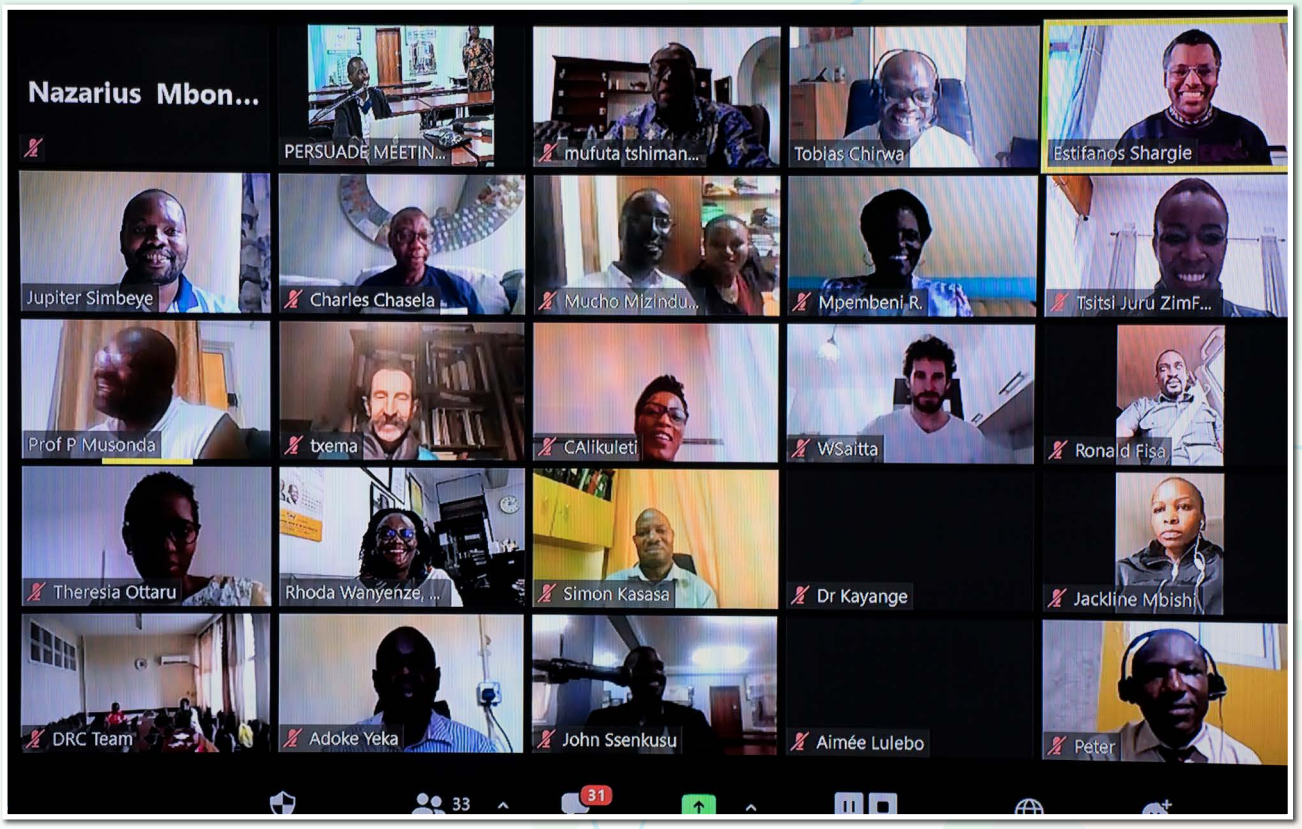
Stakeholder's consultative meeting, Lilongwe, Malawi



TB case notification trend analytical output validation meeting on 23rd November, 2019 at Radisson Blue hotel, Nairobi, Kenya

Inception phase stakeholders meeting. PERSuADE team with NACP, NMCP, NTLP and HMIS representatives from MoHCDGEC and PORALG, Tanzania

PERSuADE second face-to-face partners meeting on 28th-29th January, 2020 at White Sands Hotel, Dar es Salaam, Tanzania



End of Two year Virtual meeting on 11th December, 2020

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