Midline Evaluation of the Tanzania Public Sector System Strengthening Program

Final Report

January 2020

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MEASURE Evaluation

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Cover photo: A woman finishes drying cassava before going home in Mbamba Bay, Tanzania, the natural border between Tanzania and Malawi. © 2012 Riccardo Zennaro, courtesy of Photoshare.

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ABBREVIATIONS

AHSP	annual health sector performance profile
AHSPR	annual health sector performance profile report
AMO	assistant medical officer
ANC	antenatal care
BEMIS	Basic Education Management Information System
BEST	Basic Education Statistics in Tanzania
CFR	council financial report
CO	clinical officer
COSTECH	Tanzania Commission for Science and Technology
CPR	contraceptive prevalence rate
D-by-D	"Decentralization by Devolution" policy
DED	district executive director
DFF	Direct Facility Financing
DHIS	District Health Information Software
DHRO	district health resources officer
DMO	district medical officer
DPLO	district planning officer
FFARS	Facility Financial Accounting and Reporting Systems
FGD	focus group discussion
GOT	Government of Tanzania
GOTHOMIS	Government of Tanzania Hospital Management Information Systems
HCMIS	human capital management information system
HCW	health care worker
HMIS	health management information system
HR	human resources
HRHIS	Human Resources for Health Information System
HSS	health systems strengthening
HSSP	Health Sector Strategic Plan
ICT	information and communications technology
IFA	iron and folic acid
IRB	Institutional Review Board
IS	information systems
KII	key informant interview
LBW	low birth weight
LGA	local government authority
LGRCIS	local government revenue collection information system
M&E	monitoring and evaluation
MOHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children

NBS	National Bureau of Statistics
O&OD	Opportunities and Obstacles to Development
OC	other charges
OPRAS	Open Performance Review and Appraisal system
PE	personal emoluments
PMP	Performance Management Plan
PNC	postnatal care
POA	Prioritization and Optimization Analysis
POPSM	President's Office Public Sector Management
PO-RALG	President's Office, Regional Administration and Local Government offices
PS3	Public Sector System Strengthening project
RBF	results-based financing
RCH	reproductive and child health
REM	ripple effects mapping
RHIS	routine health information systems
SBA	skilled birth attendant
SOW	scope of work
TAMISEMI	Tanzania National Bureau of Statistics and the Presidents' Office Regional Administration and Local Government
TDHS	Tanzania Demographic Health Survey
TFR	total fertility rate
TT2+	tetanus toxin vaccine
UNC	University of North Carolina
USAID	The United States Agency for International Development
WISN	Workload Indicators of Staffing Need

EXECUTIVE SUMMARY

Evaluation Purpose

The Public Sector System Strengthening (PS3) project, funded by the United States Agency for International Development (USAID), supports the Government of Tanzania (GOT) in strengthening the public-sector system to promote the delivery, quality and use of public services. This report presents the findings of a midline performance evaluation of PS3 conducted by MEASURE Evaluation which examined time trends and pre- and post-program inception changes in the uptake of health services as well as in financial and human resources indicators in PS3 regions and in other regions of the country. The evaluation also used qualitative methods to examine the perceptions from program implementers, community members, and other stakeholders about the adoption and performance of the PS3 intervention, its strengths and remaining challenges, and the stakeholders' recommendations on ways to address those challenges. The findings of this evaluation will contribute to USAID's portfolio of projects focused on public-sector strengthening while informing PS3's continued program implementation. This evaluation was performed at about the mid-point of PS3, three years after the project's inception.

Project Background

In July 2015, USAID awarded the PS3 project in Tanzania to Abt Associates Inc. The project has an emphasis on system strengthening and improving quality of services for priority health areas (e.g., maternal and child health, HIV/AIDS, TB, malaria) as well as improving key multisectoral components at the local government level related to education, agriculture, and infrastructure. Specifically, the PS3 project aims to improve public services delivery and outcomes by strengthening national, district, and local government authority (LGA) capacity in the following areas: governance and citizen engagement, human resources, financial management and information systems, and operations research.

PS3 works across national, regional, and local government levels. The implementation strategy seeks to strengthen each of the five component areas, while working across all sectors and levels of public governance. The expectation is that strengthening systems at all levels will result in improved service delivery at the lowest level—the service provider—which will lead to higher public service utilization by the population and better health outcomes. At the national level, emphasis is placed on providing support for key policies and strategies as well as strengthening the national system to foster improvements in service delivery at lower government levels. At the regional and LGA levels, the PS3 program facilitates the understanding and implementation of national policies and guidelines as well as providing targeted assistance to improve the management and strengthening of systems and resources.

Evaluation Questions

The midline evaluation was designed to answer the following evaluation questions:

1. In PS3 focus regions, to what extent have the uptake of health services (and related indicators of service utilization, coverage of health services, quality of services and access) changed over time?
2. In PS3 focus regions, to what extent have financial and human resources indicators changed over time?
3. Are there differences in the changes over time observed in certain groups of LGAs, in particular, between Phase 1 and Phase 2 LGAs?
4. How do stakeholders perceive the performance and influence of PS3 on uptake of health services, financial and human resource systems, and community engagement and governance?
5. In PS3 focus regions, what was the context of any observed or perceived change in uptake of health services, financial and human resource systems, and community engagement and governance?
6. What challenges remain in system functioning and community engagement and governance and how do stakeholders and community members recommend these be addressed?

Methods

This midline evaluation undertook an outcome evaluation to understand how system-level indicators related to human resources, financial resources, and health service utilization changed over time in PS3 and in other (non-PS3) regions of the country. Data from national routine information systems formed the basis for quantitative measurements. Adapted difference-in-differences models were used to examine time trends before PS3 and during the time PS3 has been active, changes in those trends, and to examine differences between PS3 regions and other regions of the country. Potential differences between Phase 1 and Phase 2 PS3 LGAs were also examined. In addition, qualitative methods provided a more in-depth understanding of the performance of the PS3 intervention in human resources, finance, and system strengthening, captured unintended, indirect effects of the intervention, illuminated the process of change, and examined the quality and character of the intervention implementation. The qualitative component also captured the stakeholders' perceptions of pending challenges in system functioning and community engagement and their recommendations on how to address them.

Findings

Q1: In PS3 focus regions, to what extent has the uptake of health services changed over time? And, Q3: Are there differences in the changes over time observed in certain groups of LGAs, in particular, between Phase 1 and Phase 2 LGAs?

We examined quarterly LGA-level time series data for 18 indicators of service utilization in maternal and child health, family planning, HIV/AIDs, and drug availability. Data was obtained from District Health Information Software version 2 (DHIS2) from the first quarter of 2014 to the last quarter of 2018. For most indicators we found positive time trends in PS3 regions throughout the observation period. Antenatal care (ANC) started at a low level before 2015 and changed to an increasing trend after 2015. Facility birth delivery and skilled birth delivery attendance had significant improvements since 2014; postnatal care had significant increases after 2015 in PS3 areas as well. Supply-related indicators such as iron and folic acid supplements and vaccines showed a large drop in 2016, followed by a quick recovery in 2017. However, for most indicators, the time trends observed in PS3 regions were also observed in the other (non-PS3) regions. The trends were similar with very few indicators with significant differences between PS3 and other areas. Even HIV/AIDS-related indicators showed a strong national trend that is shared by PS3 and other areas. There was also no distinction in the time trends and changes between Phase 1 and Phase 2 LGAs for most indicators.

Q2: In PS3 focus regions, to what extent have financial and human resources indicators changed over time? And, Q3: Are there differences in the changes over time observed in certain groups of LGAs, in particular, between Phase 1 and Phase 2 LGAs?

We examined annual (fiscal year) LGA-level time series for four indicators of financial resources and yearly LGA-level time series data for 10 indicators on human resources. Personnel emoluments (PE) per capita in health and in education increased through the observation period, from fiscal year 2012/2013 to fiscal year 2017/2018, in PS3 regions. However, these levels and time trends were similar to other (non-PS3) regions. There were almost no differences in time trends between the two types of regions. A similar pattern was observed for other charges (OC) per capita in health and education. OC per capita declined before 2015 in both sectors but it held at a stable level after 2015. Similar patterns were observed for Phase 1 and Phase 2 LGAs.

For human resources, there were similar increases in the ratios of nurses per 10,000 people and doctors per 10,000 people since 2012 in both PS3 and other regions. The ratio of assistant medical officers per 10,000 people was stable during the observation period in both regions too. No differences were observed between Phase 1 and Phase 2 LGAs. In education, the primary school student-teacher ratio was declining before 2015, but afterwards changed to an increasing time trend in both PS3 and other regions. The secondary student-teacher ratio showed a significant declining trend from 2012 to 2016. It started to increase in 2017 and 2018, perhaps due to the certification verification process started by the government. There are no differences in the trends and levels between PS3 and other regions. In terms of gender balance, the proportion of primary school students that are female has been stable at around 50 percent throughout the observation period, from 2012 to 2018. In secondary school there has been a clear positive national trend of increasing participation of girls in secondary

school. By 2018, gender balance has been achieved among students of secondary schools. For teachers, there is gender balance in primary schools in both types of regions. However, the proportion of secondary school teachers that are female has been under 40 percent, but with an increasing trend until 2016 when it became stable. A similar pattern emerges in PS3 and other regions as well as in Phase 1 and Phase 2 LGAs.

Q4: How do stakeholders perceive the performance and influence of PS3 on health services, financial and human resource systems, and community engagement and governance?

Across PS3 and other regions, stakeholders perceived improvements in governance and civic engagement, finance, and human resources, as well as the information systems that support these components. Community engagement and local governance were identified by stakeholders, particularly LGA councilors, as the most significant changes. PS3 area councilors detailed greater capacity to engage citizens in addressing issues as part of their roles and responsibilities. Community members discussed a perceived increase in local accountability and transparency. Supportive training and information systems, such as those put in place by PS3 and GOT, were noted as important in these positive changes. However, stakeholders noted there are challenges that influence the public sector performance, such as finance and human resource shortages.

Q5: In PS3 focus regions, what was the context of any observed or perceived change?

Perceived and observed changes were discussed within the context of larger social and political environments. For example, the Opportunities and Obstacles to Development (O&OD) is an intensive participatory process used in both rural and urban areas as a bottom-up planning approach. This process has, for the most part, catalyzed engagement between citizens and local governments even before PS3 program implementation. However, there were claims that the planned budget was not always met and sweeping national policies are difficult to carry out. Additionally, human resource policies to verify public sector employee's certifications has led to sweeping human resource shortages, particularly in health. In education, free education policies have increased the number of students enrolled in school, but according to stakeholders this has resulted in overcrowded classrooms. Other contextual limitations include the poor/lack of availability of internet services and electricity services as well as limited capacity to use computer-based information systems.

Q6: What challenges remain in system functioning and community engagement and governance and how do stakeholders and community members recommend these be addressed?

Many of the challenges that remain are closely tied to the supportive context. Although respondents noted improvements in general for health and education systems, limited funds, staffing shortages and poor job performance concerns remained at the service delivery level. Community participants commonly noted concerns with stockouts, health service delays, too few staff at health facilities, staff not working, and too few teachers, along with growing numbers of students. While many recommendations fall beyond the scope of the PS3 program, it was recommended to address the disconnect between central and local governments and better align priorities and decision-making. There is also a need for capacity building in numerous groups on issues related to management of funds, generation of capital and profit, and record keeping. Additional and expanded trainings, as well as in-service support, were recommended to ensure optimal uptake and functioning of positively perceived systems.

Discussion

Table E.1 summarizes the quantitative evaluation results, describing the types of trends and estimated time trend differences. Columns under the heading "PS3 areas' general trend" depict the overall directionality of changes over time in PS3 areas. We observed improving trends in PS3 areas for 17 of the 32 indicators, most of which pertained to health service utilization. For 12 indicators, trends did not appear to generally improve or worsen over time—seven of these indicators had stable trends and five had volatile trends, meaning that we observed drastic variation in the levels of indicators at different time points. Indicators with volatile trends were supply-side sensitive, and thus likely reflect changes in supply conditions. Finally, three of the indicators worsened over the observed time period, pertaining to finance and human resource categories. It is important to note, that general patterns between PS3 and other areas were similar for most indicators, despite often having different levels.

Also in Table E.1, columns under the heading "PS3 compared with other areas" qualitatively reflect the differences in time trends between PS3 and other areas, comparing the differences between the before PS3 and PS3 active time periods. Estimates were significant for eight indicators. For three of these indicators, PS3 areas improved significantly more than other areas between both periods, all of which pertained to maternal health service utilization. For another four indicators, we observed significant effects that were protective. "Protective effects" were indicators that had worsening trends in both areas, but PS3 regions worsened at slower rates than other areas. Two of the indicators with significant protective effects pertained to the prevention of HIV transmission from mother to child. Finally, there was one indicator, the percentage of primary teachers that were female, that was worse in PS3 areas. However, this result should be taken cautiously as the levels of this indicator have been stable, at just below 50 percent in PS3 regions in the PS3 active period and just above 50 percent in other regions, which would be considered the level of gender parity.

Many observed and perceived changes occurred nationally. Generally, trends and perceptions show gradual improvements nationally, with few differences between PS3 and other regions, or between PS3 phases. This could be a result of various factors. First, **many of the PS3 systems were adopted by GOT and rolled-out nationally**. This points to a gap that was filled early on, but it makes finding differences in PS3 regions difficult. In both PS3 and other areas, we found improvements in health outcomes, particularly among health center access and attendance-based services, such as ANC, ANC4+, and facility birth deliveries. Qualitative results suggest these improvements may have been related to better understanding the importance of visiting health centers, as well as improvements in supportive infrastructure such as roads and the building of health centers. As such, it is important to note that **PS3 is one of several programs contributing to public sector development**. This includes, as noted by qualitative participants, other USAID-funded programs such as Boresha Afya, which supports integrated service delivery at the health facility and community levels across the country. World Vision and Amref were discussed and credited for improving awareness and education on health services, which help to draw patients to health centers.

Table E.1. Summary of time trends and annualized changes in indicators

Indicators	Significant	PS3 areas' general trend (based on graphs)				PS3 compared with other areas (based on DID estimates)					
		Improving trend	About the same or stable trend	Volatile trend	Worsening trend	Significantly better in PS3 areas	Better, but no significant difference	Significantly protective in PS3 areas	Protective, but no significant difference	Worse, but no significant difference	Significantly worse in PS3 areas
• ANC coverage before 12 weeks gestational age		x					x				
• Pregnant women attending ANC 4+ times		x					x				
• Prevalence of pregnant women receiving IFA supplementation for 90+ days				x						x	
• Pregnant women receiving TT2+ at ANC				x					x		
• Women tested for anemia at ANC	x	x				x					
• Women tested for syphilis at ANC	x	x				x					
• Deliveries taking place in health facilities		x							x		
• Births assisted by skilled attendants		x								x	
• Mothers receiving postnatal care before 7 days	x	x				x					
• Prevalence of low birth weight		x					x				
• Measles vaccination coverage				x						x	
• Penta3 vaccination coverage				x						x	
• ANC partners HIV testing rate		x					x				
• HIV-exposed infants receiving first HIV test within 2 months after birth	x	x						x			
• HIV-exposed infants initiated on cotrimoxazole within 2 months after birth	x	x						x			
• Couple HIV counseling and testing at ANC		x								x	
• Contraceptive prevalence rate			x							x	
• Health facilities with RCH tracer drugs package				x						x	

Table E.1. Summary of time trends and annualized changes in indicators (continued)

Indicators	Significant	PS3 areas' general trend (based on graphs)				PS3 compared with other areas (based on DID estimates)					
		Improving trend	About the same or stable trend	Volatile trend	Worsening trend	Significantly better in PS3 areas	Better, but no significant difference	Significantly protective in PS3 areas	Protective, but no significant difference	Worse, but no significant difference	Significantly worse in PS3 areas
• PE per capita in health		x					x				
• PE per capita in education		x					x				
• OC per capita in health					x					x	
• OC per capita in education	x				x			x			
• Nurses per population			x						x		
• Doctors per population			x						x		
• AMOs per population	x		x					x			
• Health care workers that are female		x					x				
• Primary school student-teacher ratio					x					x	
• Secondary school student-teacher ratio		x								x	
• Primary school students that are female			x						x		
• Secondary school students that are female		x							x		
• Primary school teachers that are female	x		x								X^
• Secondary school teachers that are female			x							x	
Total	**8**	**17**	**7**	**5**	**3**	**3**	**7**	**4**	**6**	**11**	**1**
Total significant and favorable	**7**										

Note: None of the indicators were improving in PS3 areas only or worsening in PS3 areas only.
^: Results of this indicator should be interpreted with caution.

Broader policy may have heavily influenced observed and perceived changes: In 2015, the Tanzanian government established policies that directed public bodies to ensure education is free for all children. This was met with another policy to ensure staff are properly qualified and certified. As such, we found increases in student-teacher ratio trends in both primary and secondary education. Similarly, in health, stakeholders commonly discussed a shortage of health care workers. These issues influenced community members' perceptions of public sector performance. Despite these national issues, stakeholders perceived systems put in place by PS3 and GOT as valuable in creating efficiencies and improving public sector system performance. However, these systems are relatively new, and this perception may be compromised by long-term stagnation or issues around commodities. As such, **the program may require more time to realize changes in outcomes** beyond those seen in this midline evaluation. As this is a systems intervention that addresses underlying facets of the public sector, it is anticipated that observed changes may still yet be seen.

Differences in programmatic intervention seen primarily at lowest levels: Where PS3 and other areas differed were often at the lowest levels of intervention. For example, PS3 stakeholders, particularly LGA councilors, identified **local community engagement and good governance as substantial changes** coming out of PS3 programs. LGA councilors discussed having the knowledge and skills to attend to community members' needs and complaints. They also discussed improvements in transparency and accountability at the local level.

However, local gains may encounter challenges as they interact with regional and central priorities. A commonly noted issue in creating development plans at the local level was the availability of financial and human resources to carry out these plans. In response, LGAs developed plans and submitted them, but often learned that the central government had different funding priorities. PS3 stakeholders also discussed **trainings on information systems as important in highlighting the value of these systems and encouraging their use.**

Based on the findings, we provide the following recommendations for PS3:

<u>Information systems</u>

- Support internet service nationally or work with central/local government to plan for this in budgets and ensure staff are not paying for internet service out of personal funds
- Investigate concerns with Workload Indicators of Staffing Need (WISN) staffing categories and accuracy of input data
- Assess whether additional categories of staff may benefit from access to Facility Financial Accounting and Reporting Systems (FFARS)
- Continue to work towards interoperability of information systems
- Institute a mechanism to regularly communicate system updates/new features to users

<u>Training</u>

- Carry out needs assessment at facilities prior to information system install, ensuring staff have capacity to use and maintain information systems; then train as needed
- Ensure supervisors are invited or educated on why their subordinates are invited to trainings; since it may not be feasible or necessary to train them to the same depth as their subordinates, PS3 might consider developing a shorter, awareness-raising session aimed at this audience so that they at least feel engaged and understand the value of the systems
- Consider establishing refresher trainings
- Maintain and expand in-service support
- Integrate how to plan for growing populations into the LGA councilor budget and development training
- Continue good governance work but increase transparency (e.g., with suggestion boxes)

Citizen engagement and governance

- Address disconnect between central and local government in planning and budgeting
    - In trainings, set expectations on what to expect from central government with regard to budgeting and planning (i.e., they may not receive all requested funds), and share messages to communicate with citizens so as to similarly set their expectations
    - Increase understanding at LGA level of how central government is making funding allocation decisions
    - Increased work with central government to encourage better communication (for example, on funding priorities and timelines) and collaboration with LGAs
- Increase publicity for new accountability mechanisms and information sources like the new websites, health clinic comment boxes, etc.; for example, participants suggested making TV and radio announcements and posting notices at health centers and schools.

Gender

- Address secondary school teacher gender parity issues in human resources efforts; for example, investigate potential barriers to recruiting and maintaining secondary school teachers that are female, and assess whether gender sensitivity training for teachers, students, and administrators may be needed to create environments where women feel respected and safe

Limitations

MEASURE Evaluation utilized data from routine information systems to examine how key indicators of health service uptake, financial resources, and human resources changed over time before and after the implementation of PS3. Data sources, including DHIS2, have common challenges that can generally be described as: technical, behavioral, or organizational. Technical challenges include burden of data collection at the point of care, data management challenges, and incomplete or inaccurate data. Behavioral challenges include limited knowledge, lack of value for data, and limited guidance on how to collect and use data. Organizational challenges include staffing shortages, stockout of standard registrars, and lack of supportive supervision. These challenges contribute to data quality problems.

Qualitative limitations include the possibility that participants did not feel comfortable freely sharing their perspectives on a project that is closely aligned with the government, especially if they worked for the government in some capacity. Additionally, the qualitative data was not collected in all PS3 areas so the results might not reflect the experiences of those clusters not sampled.

1. INTRODUCTION

This document is the report of the midline performance evaluation of the Public Sector System Strengthening project (PS3) in Tanzania. It presents findings from the time trends analysis of key service utilization, financial and human resources indicators, and the qualitative analysis that were used to answer six evaluations questions posed by USAID/Tanzania about PS3. This report presents findings as of about the mid-point of the life of the PS3, after three years of project inception.

1.1. Country Context

Tanzania has made important progress in recent years. There has been rapid economic growth of over 7 percent per year, and significant improvements have been made on some key health indicators. However, challenges remain. Tanzania has one of the most rapidly growing populations globally at 2.7 percent per year, with the urban population growing approximately 5 percent per year (Economic and Social Research Foundation, et al., 2015). Tanzania also has poor living standards, particularly in rural areas, with national poverty and extreme poverty levels at 28.2 percent and 9.7 percent, respectively (Economic and Social Research Foundation, et al., 2015). The Government of Tanzania (GOT) has set an ambitious target to reduce poverty significantly and become a middle-income country by 2025. However, to achieve this goal Tanzania will have to tackle numerous pressing health issues in its growing population.

1.2. The Development Problem: Health Outcomes

Prior to the start of PS3, Tanzania has made significant headway in various health outcomes. For instance, according to the 2015/2016 Tanzania DHS (TDHS), 98 percent of pregnant women attended at least one antenatal visit with a skilled provider, the percentage of pregnant women attending at least four prenatal visits (ANC4) increased from 43 percent to 51 percent, and the percentage of women receiving timely postnatal care (PNC) increased from about 30 percent to 34 percent (Ministry of Health, et al., 2016; National Bureau of Statistics (Tanzania), & ICF Macro, 2011). However, challenges remain. The 2015/2016 TDHS estimated maternal mortality at 556 maternal deaths per 100,000 live births, which was not significantly different from 2004/2005 TDHS estimates (Ministry of Health, et al., 2016). There is evidence that not enough women received recommended levels of care despite general improvements in perinatal care between 2010–2016. Despite the improvements in utilization of ANC4 and PNC, adequate prenatal and postnatal coverage was still low. These low levels may be due the challenges accessing health facilities: 65.5 percent of women reported having problems accessing health care in 2015/2016, which had increased from 35.5 percent in 2010. The most commonly reported challenges included distance to health facility (42.3%) and having enough money for treatment (49.5%) Such barriers may explain under-utilization of maternal health services (UNESCO Institute for Statistics, 2019).

Among other achievements, Tanzania was one of only a handful of African countries to achieve the MDG 4 objective on child survival. Comparing estimates between the 2004/2005 and 2015/2016 TDHS, the under-5 mortality rate declined from 112 to 67 per 1,000 live births. There were still areas of child health with potential for improvement before PS3 began. The percentage of children with diarrhea receiving treatment decreased from 62.2 percent at its peak in 2004/2005, to 59.1 percent in 2010, and then to 49 percent in 2015/2016. While the proportion of children who were stunted and underweight decreased from 2004/2005, over one-third of children were stunted in 2015/2016. Similarly, the prevalence of anemia among children remained steadily high, at around 58 percent since 2004/2005 (UNESCO Institute for Statistics, 2019).

Preceding PS3 implementation, net primary school enrollment also declined from 79.7 percent in 2010, to 75.6 percent in 2015. About 78 percent of primary-age females were enrolled in school in 2015/2016, which was a slight decline from 81.2 percent in 2010. Female secondary school attendance remained low at about 29 percent in both 2010 and 2015/2016 (UNESCO Institute for Statistics, 2019).

1.2.1. Influence of Devolution on the Tanzanian Health System

The "Decentralization by Devolution" policy (D-by-D) was passed under Tanzania's Local Government Reform Act in 1996, initiating the decentralization of public sector planning and service delivery from the central government to the local governance system. The aim of the D-by-D policy was to bring decision-making for resource allocation and services to the local level so that local needs were better addressed, and local people could actively participate in the decision-making process (Masson, L. & Norman, A.S., 2009). However, during the time prior to PS3, the D-by-D policy resulted in many challenges at the local level, stemming from inefficiencies in service delivery related to inadequate financing and financial management skills, poor coordination, communication, and unclear scopes of work (SOWs) for district stakeholders. These inefficiencies extended across all aspects of local governance, such as health service delivery, agriculture, infrastructure, and education. Therefore, they needed to be addressed if Tanzania was to meet its developmental goals.

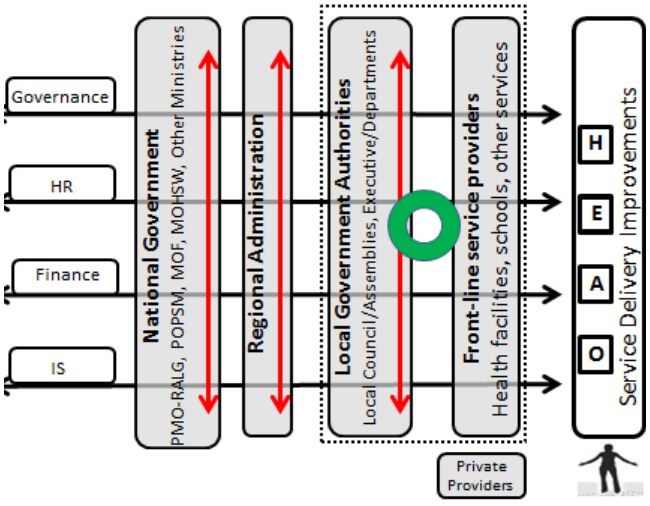
1.3. USAID's Response to the Need to Strengthen Health Systems in Tanzania

1.3.1. PS3 Project Overview

In July 2015, in response to those systems-level gaps resulting from decentralization, USAID started the PS3 in Tanzania. The overall objective of PS3, led by Abt Associates Inc., is to support the GOT in strengthening the public-sector system to promote the delivery, quality, and use of services, particularly for underserved populations. There is an emphasis on system strengthening and improving quality of services for priority health areas (e.g., HIV/AIDS, maternal and child health, TB, malaria) as well as improving key multisectoral components at the local government level related to agriculture, infrastructure, and education. Specifically, PS3 aims to improve public services delivery and outcomes by strengthening national, district, and local government authority (LGA) capacity in the following areas: governance and citizen engagement, human resources, financial management and information systems, and operations research.

PS3 works across national, regional, and local government levels. This is reflected in the PS3 Implementation Strategy (Figure 1). The strategy for implementation shows that systems are strengthened in each of the five component areas, while also working across all sectors and levels of public governance. The expectation is that strengthening systems at all levels will result in improved service delivery at the lowest level—the service provider—which will lead to higher public service utilization by the population and better health outcomes. At the national level, an emphasis was placed on providing support for key policies and strategies as well as strengthening the national system to foster improvements in service delivery at lower government levels. At the regional and LGA levels, the PS3 program aimed to facilitate the understanding and implementation of national policies and guidelines as well as to provide strategic assistance and improve the management and strengthening of systems and resources.

Figure 1. PS3 implementation strategy (source: PS3 year 2 workplan)



In order to achieve these outcomes, PS3 has undertaken nine primary interventions:

1. Designing and conducting the world's first Workload Indicators of Staffing Need (WISN) coupled with Prioritization and Optimization Analysis (POA) to staff Tanzania's facilities based upon beneficiary need
2. Establishing Direct Facility Financing (DFF) to pay facilities for priority service outputs and increase facility autonomy to meet beneficiary need
3. Extending a transparent, efficient, and interoperable PlanRep system to the facility level to allow facilities to plan and budget to meet beneficiaries' needs
4. Clarifying and strengthening roles and relationships for support service delivery between all levels and other governance interventions sharing information and obtaining input from citizens and communities
5. Supporting facilities to use their funds to procure the best mix of inputs to deliver services to beneficiaries
6. Developing and implementing a new Facility Financial Accounting and Reporting Systems (FFARS) so that facilities can manage finances to provide value to beneficiaries
7. Establishing systems, tools, and management processes for LGAs and facility managers to motivate their staff to deliver services
8. Extending GOT Hospital Management Information Systems (GOTHOMIS) to facility levels so service quality improvement is centered on beneficiaries
9. Financing and payment systems to ensure GOT policies on exemptions are realized so beneficiaries who cannot pay for services are given equitable access and financial risk protection for catastrophic health expenditures

These nine interventions aim to produce systemic change within Tanzania's health systems to benefit the average Tanzanian seeking health care. To institutionalize these changes, PS3 has worked closely with the GOT to identify priorities, implement comprehensive solutions, and develop strong partnerships at all levels.

Figure 2. PS3 implementation focus regions

1.3.2. Target Population and Geographic Areas

PS3 was implemented in Tanzania (see Figure 2) in 93 LGAs within 13 focus regions (Appendix A). The focus regions were chosen based on several factors, including the location of current USAID programming efforts, the location of donor partner programming for health systems strengthening activities, areas of highest burden of disease, and LGAs with low performance of health systems strengthening (HSS) indicators. At the start of the project, PS3 utilized a two-phase approach to identify 26 LGAs (two in each of the 13 regions) that would receive a more robust package of PS3 support (Phase 1) compared to the 67 LGAs which would receive a standard package of PS3 support (Phase 2).[1] The Phase 1 LGAs are shown in Table 1. Interventions in Phase 1 LGAs started in year one of the project. Interventions in Phase 2 LGAs started in year 2 of the project.

The differences between Phase 1 and 2 LGAs vary based on the intervention. For example, under human resources (HR), in Phase 1 LGAs, PS3 has assisted LGAs in developing customized staff retention plans. Similar intensive work was not carried out in Phase 2 LGAs. It is important to note that as time progressed and PS3 adapted the interventions to the actual needs of every LGA, the distinction between Phase 1 and Phase 2 has faded in terms of project involvement, project resources allocated, and the composition of interventions.

In addition, PS3 has created six "Mentor Clusters" in which they have regionally located their finance, governance, information systems, and HR mentors. The clusters are as follows: Southern Cluster (Lindi and Mtwara), Central Cluster (Morogoro and Dodoma), Eastern Lake Cluster (Shinyanga, Mwanza, and Mara), Western Cluster (Kagera and Kigoma), Western South Highlands Cluster (Mbeya and Rukwa), and Eastern South Highlands Cluster (Njombe and Iringa).

PS3 addressed underperforming areas of national and local governments' operations. As a result, in 2017 the GOT expressed strong support for the PS3 activities and supported the rollout at the national level. This led to different PS3 activities having different rollout schedules. For example, in year 3, the GOT committed to hiring 6,180 health workers, which provided PS3 the opportunity to apply the simplified WISN plus POA to all 185 LGAs in Tanzania.

PS3 and Touch Foundation completed the analysis for all 185 LGAs and developed hiring recommendations for all LGAs. While this tool was utilized in all LGAs, PS3 provided direct follow-up mentoring to its 93 LGAs.

Other PS3 instruments have now been implemented in all 185 LGAs. For example, in December 2017, about 50 percent of all LGAs, health facilities, and schools were utilizing PlanRep for their plans and budgets. Beginning in January 2018, the President's Office, Regional Administration and Local Government (PO-RALG) offices and PS3 teams launched a concerted effort to get all LGAs, health facilities, and schools to utilize PlanRep. It is now being utilized in all LGAs, representing use among 24,229 public health facilities, 15,315 primary schools, and 3,511 secondary schools. In Year 3, GOT and PS3 jointly strengthened the Epicor accounting system and then introduced it to all LGAs. The updated Epicor system was deployed to all LGAs at the beginning of FY2018/2019 on July 1, 2018. According to a September 2018 analysis, all LGAs were using the system and 87,468 transactions had been processed, representing the concerted efforts of the PO-RALG and PS3 teams who provided mentoring and troubleshooting help to LGAs (USAID/Tanzania Public Sector Systems Strengthening Activity, 2018).

[1] For simplicity, robust LGAs will be referred to as "Phase 1," LGAs and LGAs receiving the standard package of support will be referred to as "Phase 2."

Table 1. Phase 1 LGAs

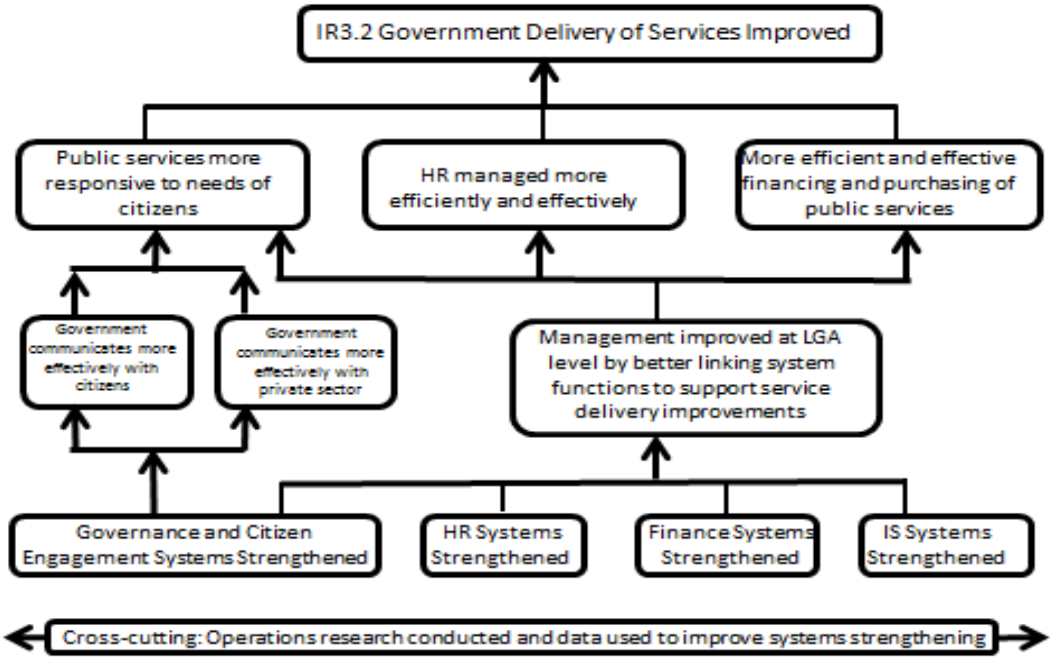
Region	LGA
Dodoma	Chemba DC
	Bahi DC
Kigoma	Uvinza DC
	Buhigwe DC
Iringa	Iringa DC
	Kilolo DC
Njombe	Wanging'ombe DC
	Makete DC
Kagera	Kyerwa DC
	Biharamulo DC
Mtwara	Masasi TC
	Nanyamba TC
Mbeya	Busokelo DC
	Chunya DC
Lindi	Kilwa DC
	Ruangwa DC
Mara	Butiama DC
	Rorya DC
Mwanza	Kwimba DC
	Sengerema DC
Rukwa	Sumbawanga DC
	Kalambo DC
Morogoro	Kilosa DC
	Gairo DC
Shinyanga	Shinyanga DC
	Kishapu DC

1.3.3. PS3 Results Framework

As shown in the PS3 implementation strategy and in the results framework below (Figure 3), the PS3 program will strengthen systems with the goal improving service delivery. In addition, the results framework emphasizes that better use of existing resources will also lead to improved service delivery.

There are three levels of results in the PS3 results framework. The first level is focused on strengthening operational systems (finance, HR, IS, and governance) across national, regional, and local government levels. The second level is focused on improved management at the LGA level, which includes linking systems and services across levels of government and sectors, in addition to more effective communication between the government and citizens and the private sector. Increased effective communication will result in synergies between the public and private sectors, as well as public services that are more transparent and responsive to citizens' needs. The third and final level is focused on prioritization of efficiency and responsiveness of public systems. Each level of the results framework feeds directly into USAID/Tanzania's CDCS, IR 3.2, government delivery of services improved.

Figure 3. PS3 results framework (source: PS3 year 2 workplan)



1.4. Evaluation of the PS3 Project

1.4.1. Evaluation Objectives

MEASURE Evaluation undertook a midline performance evaluation of the PS3 program with the goal of examining pre- and post-program inception changes in the uptake of health services, as well as in financial and HR indicators in PS3 regions and in other regions of the country. The evaluation also uses qualitative methods to capture information on the perceptions from program implementers, community members, and other stakeholders about the adoption and performance of the PS3 intervention, its strengths and remaining challenges, and the stakeholders' recommendations of ways to address those challenges.

1.4.2. Evaluation Questions

The evaluation was designed to answer the following evaluation questions that were provided by USAID/Tanzania:

1. In PS3 focus regions, to what extent has the uptake of health services (and related indicators of service utilization, coverage of health services, quality of services and access) changed over time?
2. In PS3 focus regions, to what extent have financial and human resources indicators changed over time?
3. Are there differences in the changes over time observed in certain groups of LGAs, in particular, between Phase 1 and Phase 2 LGAs?
4. How do stakeholders perceive the performance and influence of PS3 on uptake of health services, financial and human resource systems, and community engagement and governance?
5. In PS3 focus regions, what was the context of any observed or perceived change in uptake of health services, financial and human resource systems, and community engagement and governance?
6. What challenges remain in system functioning and community engagement and governance, and how do stakeholders and community members recommend these be addressed?

2. EVALUATION METHODS

This midline evaluation undertook an outcome evaluation to understand how system-level indicators related to human resources, financial resources, and health service utilization changed over time in PS3 and in non-PS3 regions of the country. Data from national routine information systems formed the basis for quantitative measurements. In addition, qualitative methods provided a more in-depth understanding of the performance of the intervention in human resources, finance, and system strengthening, captured unintended, indirect effects of the intervention, illuminated the process of change, and examined the quality and character of the intervention implementation. The qualitative component also captured the stakeholders' perceptions of pending challenges in system functioning and community engagement and their recommendations on how to address them.

2.1. Quantitative Evaluation Design

The quantitative component of the evaluation was designed to answer the first three evaluation questions. MEASURE Evaluation utilized data from routine information systems to conduct time trends analysis to examine how key indicators of health service uptake, financial resources, and human resources changed over time before and after the implementation of PS3. The PS3 program focuses operations in 93 LGAs located in 13 focus regions of mainland Tanzania, therefore, we collected and compiled data from several information systems at the LGA-level for outcome monitoring over time. PS3 is also collaborating with the government of Tanzania to implement selected tools and interventions nationally. The time trends analysis includes examining changes in the group of LGAs that were not assigned to PS3 at the start of the project. We called this non-PS3 group "other regions." We examine time trends before and after PS3 was established in July 2015 in both PS3 and other regions. Time series data were collected from all LGAs in mainland Tanzania from 2013 to 2018. This also allowed us to conduct additional analysis of the before-and-after time trends to subsets of PS3 LGAs, specifically to Phase 1 and Phase 2 LGAs.

2.1.1. Quantitative Analytical Approach

Two models are employed for examining time trends. The first model is designed to answer the first and second evaluation questions regarding changes in trends in PS3 and other regions before and after PS3 was established. Model 1 is:

$$Y_{jt} = \alpha_0 + \alpha_1 time_t + \alpha_2 T_{jt} + \alpha_3 time_t * T_{jt} + \alpha_4 PS3_j + \alpha_5 time_t * PS3_j + \alpha_6 T_{jt} * PS3_j + \alpha_7 time_t * T_{jt} * PS3_j + \varepsilon_{jt}$$

Where Y_{jt} represents the service utilization, financial, or human resources outcome of interest for LGA j at time t.

Given that we were able to access DHIS2 quarterly data for health service utilization indicators from 2014 to 2018 and that the PS3 officially started in July 2015, we define the "Before PS3" period from the first quarter of 2014 to the second quarter of 2015.[2] We define the "PS3 active" period from the third quarter of 2015 to the fourth quarter of 2018.[3] Formally, T_{jt} is an indicator variable defined as:

$$T_{jt} = \begin{cases} 1, if\ the\ observation\ is\ from\ the\ PS3\ Active\ time\ interval \\ 0, if\ the\ observation\ is\ from\ the\ Before\ PS3\ time\ interval \end{cases}$$

We intend to examine time trends for the PS3 regions and for the other regions. Then, we define:

$$PS3_j = \begin{cases} 1, if\ LGA\ j\ is\ in\ the\ PS3\ regions \\ 0, if\ LGA\ j\ is\ in\ the\ Other\ regions\ (non-PS3) \end{cases}$$

[2] In some cases, data were available from time periods prior to 2014. Data for some service utilization indicators was available as early as the third quarter of 2013. Financial and human resources data were available from 2012 at yearly time intervals. In these cases, earlier quarters/years were also included in time period "Before PS3."
[3] Financial data were available only through fiscal year 2017/2018.

And, $time_t = t$, time count in quarters since the first quarter of 2014.[2]

Model 1 is estimated for each health service utilization indicator using the pooled quarterly time series dataset for all LGAs of the country. The model is also estimated for each financial and human resources indicator using pooled yearly time series data for all LGAs.

The model provides estimates of the time trends for specific time periods and for each group of interest. They are defined as the average change per quarter in the health service utilization indicator Y_{jt} for each of the two time-intervals of interest for both PS3 and other regions. Specifically, we have that:

- $(\alpha_1+\alpha_5)$ is the average change per quarter in Y_{jt} before PS3, in PS3 regions
- $(\alpha_1+\alpha_5) + (\alpha_3+\alpha_7)$ is the average change per quarter in Y_{jt} during the time PS3 active, in PS3 regions
- α_1 is the average change per quarter in Y_{jt} before PS3, in other regions
- $(\alpha_1+\alpha_3)$ is the average change per quarter in Y_{jt} during the time PS3 active, in other regions.

Model 1 also allows us to examine if the time trend before PS3 changed during the time PS3 active. In order to examine the time trend changes for each specific group of regions, we take the difference of the estimated time trends above:

- In PS3 regions, the change in time trends before and after PS3 is given by $(\alpha_3 + \alpha_7)$
- In other regions, the change in time trends before and after PS3 is given by α_3

It is important to note that the modeling approach used for models 1 and 2 above is an adaptation of the difference-in-differences strategy to model time trends for two areas (and three areas, in the case of model 2) and to examine changes in time trends before and after PS3. The changes in the time trends estimated by the model cannot be interpreted as program effects on the outcomes. If we take the difference of the two differences above we have α_7, which is interpreted as the estimate of how much the before-and-after change in time trends in PS3 regions differs from the before-and-after change in time trends in other regions.

2.1.1.1. Examining Differences in Time Trends between PS3 Phase 1 and Phase 2 LGAs

We extend model 1 to expand the answers to evaluation question three regarding differences in time trends for three groups, PS3 Phase 1, PS3 Phase 2, and other regions. We define:

$$PS3P1_j = \begin{cases} 1, if\ LGA\ j\ is\ in\ the\ PS3\ Phase\ 1\ group \\ 0, if\ the\ LGA\ is\ in\ any\ other\ group\ (Other\ or\ PS3\ Phase\ 2) \end{cases}$$
$$PS3P2_j = \begin{cases} 1, if\ the\ LGA\ is\ in\ the\ PS3\ Phase\ 2\ group \\ 0, if\ the\ LGA\ is\ in\ any\ other\ group\ (Other\ or\ PS3\ Phase\ 1) \end{cases}$$

Then, Model 2 is:

$$Y_{jt} = \beta_0 + \beta_1 time_t + \beta_2 T_{jt} + \beta_3 time_t * T_{jt} + \beta_4 PS3P1_j + \beta_5 time_t * PS3P1_j + \beta_6 T_{jt} * PS3P1_j + \beta_7 time_t * T_{jt} * PS3P1_j + \beta_8 PS3P2_j + \beta_9 time_t * PS3P2_j + \beta_{10} T_{jt} * PS3P2_j + \beta_{11} time_t * T_{jt} * PS3P2_j + \varepsilon_{jt}$$

Model 2 is estimated for each health service utilization indicator using the pooled quarterly time series dataset for all LGAs of the country. For financial and HR we used pooled yearly time series data. This model provides estimates of the time trends for specific time periods and for each of the three groups of interest. The interpretation of coefficients is similar as in model 1. Specifically, we have that:

- $(\beta_1 + \beta_5)$ is the average change per quarter in Y_{jt} before PS3, in Phase 1 LGAs
- $(\beta_1 + \beta_5) + (\beta_3 + \beta_7)$ is the average change per quarter in Y_{jt} during the time PS3 active, in Phase 1 LGAs
- $(\beta_1 + \beta_9)$ is the average change per quarter in Y_{jt} before PS3, in Phase 2 LGAs

- $(\beta_1 + \beta_9) + (\beta_3 + \beta_{11})$ is the average change per quarter in Y_{jt} during the time PS3 active, in Phase 2 LGAs
- β_1 is the average change per quarter in Y_{jt} before PS3, in other regions
- $(\beta_1 + \beta_3)$ is the average change per quarter in Y_{jt} during the time PS3 active, in other regions

Model 2 also allows us to examine if the time trends before PS3 changed during the time PS3 active for each of the three groups of LGAs. As in the previous model, in order to examine time trend changes for each specific group of LGAs, we just take the difference of the estimated time trends above:

- In Phase 1 LGAs, the change in time trends before and after PS3 is given by $(\beta_3 + \beta_7)$
- In Phase 2 LGAs, the change in time trends before and after PS3 is given by $(\beta_3 + \beta_{11})$
- In other regions, the change in time trends before and after PS3 is given by β_3

If we take the difference of the changes above for Phase 1 and other regions, we have β_7, which is interpreted as the estimate of how much the before-and-after change in time trends in Phase 1 LGAs differs from the before-and-after change in time trends in other regions. Likewise, the difference of the changes above for Phase 2 and other regions is β_{11}, which is interpreted as the estimate of how much the before-and-after change in time trends in Phase 2 LGAs differs from the before-and-after change in time trends in other regions. For obtaining the difference of the changes for Phase 1 and Phase 2 we can use $(\beta_7 - \beta_{11})$, which is interpreted as the estimate of how much the before-and-after change in time trends in Phase 1 LGAs differs from the before-and-after change in time trends in Phase 2 LGAs.

2.1.2. Outcome Measures

The PS3 objective of improving the public health system's operational capacity leading to improved service delivery of public services and population health can be defined and measured in a number of ways. The program is expected to promote the delivery and use of health services, through strengthening and supporting government systems related to the following components: governance and citizenship engagement, human resources, financial resources, and information systems.

By design, the outcome evaluation approach allows for the analysis of multiple outcomes. The final list of indicators included in the evaluation is shown in Table 2. To the extent possible, the indicators were chosen based on their relevance in reflecting LGA operational performance and uptake of services influenced by PS3 interventions, quality of data, availability of time series data in the existing information systems, and feasibility of accessing the data by the evaluation team. We prioritized inclusion of indicators already included in the PS3 results framework, particularly related to financial and human resources, where time series data were available. The selection of indicators was informed by review of several key government documents (Annual Health Sector Performance Profile Reports, Annual Health Statistical Abstract (also called Annual Health Statistical Tables and Figures), the Result-Based Financing Operational Manual, and the Health Sector Strategic Plan, 2015–2020 (HSSP IV) (Ministry of Health, Community Development, Gender, Elderly and Children, 2015, 2018). Indicators were also selected from feedback from stakeholders at a national meeting conducted in Dodoma in April 2018, and from consultation with USAID/Tanzania officials. We also reviewed USAID/Tanzania's Performance Management Plan (PMP) to align our indicators with those in the PMP. For the time series analysis, it was necessary to have data for years before PS3 implementation and for the years PS3 was active. Indicators were also chosen if data was available starting during the first quarter in 2014 or earlier through at least the last quarter in 2018. Indicators were prioritized if data was available quarterly for all LGAs, as detailed time series data were necessary for the analysis. Appendix C has definitions for each indicator, the data source, and the date range used in the analysis.

2.1.3. Description of Quantitative Data Sources and Data Collection

Tanzania has numerous routine data sources for LGA-level data, such as PlanRep, DHIS2/HMIS, EPICOR, HCMIS/Lawson, and BEMIS, though most of these data sources do not have complete time series data from 2012 to 2018 and data are not necessarily available for all LGAs. We spent a considerable amount of time trying to identify finance and HR data sources that would be able to provide the type of indicators needed

and for the duration of time required. After substantial review and discourse over availability of complete time series data, including consultation with PS3, USAID/Tanzania, and the GOT, we determined that the indicators for each of the main domains would come from a variety of data sources (Appendix C). All the data on service delivery from 2013–2018 were extracted from the DHIS2 initially. To ensure the data reflected the most up-to-date records, a further data compilation and verification process was undertaken in February 2019 with staff from the MOHCDGEC's M&E Unit. The data were extracted for all the selected indicators for each quarter from 2014 to 2018 and organized in Microsoft Excel files.[4]

Table 2. List of indicators

Category		Indicator
Service utilization	Maternal health	ANC coverage before 12 weeks gestational age
		Pregnant women attending ANC 4+ times
		Prevalence of pregnant women receiving iron and folic acid (IFA) supplementation for 90+ days
		Pregnant women receiving TT2+ (tetanus/ diphtheria/pertussis vaccination) at ANC
		Women tested for anemia at ANC
		Women tested for syphilis at ANC
		Deliveries taking place in health facilities
		Births assisted by skilled attendants**
		Mothers receiving postnatal care before 7 days
	Infant and child health	Prevalence of low birth weight
		Measles vaccination coverage
		Penta3 vaccination coverage
	HIV/AIDS	ANC partners HIV testing rate
		HIV-exposed infants receiving first HIV test within 2 months after birth
		HIV-exposed infants initiated on cotrimoxazole within 2 months after birth
		Couple HIV counseling and testing at ANC
	Other	Contraceptive prevalence rate**
		Health facilities with RCH tracer drugs package
Financial resources		Personal Emoluments (PE) per capita in health^^
		PE per capita in education^^
		Other charges (OC) per capita in health^^
		OC per capita in education^^
Human resources		Nurses per 10,000 people**,^^
		Doctors per 10,000 people
		Assistant medical officers per 10,000 people
		Health care workers that are female
		Primary school student-teacher ratio**,^^
		Secondary school student-teacher ratio
		Primary school students that are female
		Secondary school students that are female
		Primary school teachers that are female
		Secondary school teachers that are female

** Indicator based on USAID PMP Indicator list
^^ Indicator based on PS3 M&E plan Indicator list

[4] In some cases, data were available from time periods prior to 2014. Data for some service utilization indicators was available as early as the third quarter of 2013. Financial and human resources data were available from 2012 at yearly time intervals. In these cases, earlier quarters/years were also included in time period "Before PS3."

Once it was determined that access to the EPICOR financial system was unlikely, and more importantly, would likely yield neither the indicators desired nor the complete time series, we engaged the PS3 project to understand what finance data they were utilizing for project monitoring of key indicators. PS3 had partnered with PO-RALG to review and compile LGA level council financial reports (CFR) from 2013/2014 to 2017/2018. Their two primary finance-related indicators were being captured in these CFRs. In partnership with a key staff member from PS3, we worked directly with PO-RALG to complete the time series and compile and clean the CFRs for 2012/2013.

After review of the routine information systems on human resources, three data sources were selected for use: Basic Education Statistics in Tanzania (BEST), OPENDATA for HR for Education, and Human Resources for Health Information Systems (HRHIS) for HR for health data. Permission to access the data from these databases was obtained from the Ministry of Education Science and Technology and the Ministry of Health Community Development Gender Elderly and Children, respectively. For the 2016–2018 HR for education data, permission was sought from PO-RALG.

See Appendix D for more background on the data sources utilized in the PS3 evaluation.

2.2. Qualitative Study Design

A total of six LGAs in PS3 areas and three LGAs in non-program areas were purposefully selected according to: (1) a range of system performance, socioeconomic indicators, and disease burden, (2) status as a Phase 1 versus Phase 2 LGA, (3) status as a newly established LGA versus historical LGA, and (4) location in key clusters: Eastern Lake Cluster, Central Cluster, and Eastern Southern Highlands Cluster.

Table 3. LGAs selected for qualitative sample

	Phase 1	Phase 2	Other
Eastern Lake	Shinyanga DC (R)	Ilemela MC (U)	Nyong'hwale DC (R)
Central	Bahi (R)	Kilosa (R)	Manyoni (R)
E. Southern Highlands	Wanging'ombe DC (R)	Makambako TC (U)	Songea MC (U)

R=rural; U=Urban

We intentionally chose a mix of urban and rural wards within LGAs for conduct of community FGDs. Adult participants were purposefully selected by sex and location, and based on their participation in health or education committees. Two focus group discussions (1 male/1 female) were conducted in each of the nine LGAs. Each FGD had 8 to 10 participants and in total there were 90 men and 90 women participants in community FGDs. FGDs took from 1 to 2 hours and were conducted in Swahili.

Ripple effects mapping (REM) group discussions were conducted in the six program LGAs (one per LGA). Each discussion had 8–12 adult participants and there were a total of 29 men and 20 women. Councilors were selected based on participation in PS3 trainings and to represent a range of ward vulnerabilities (e.g., higher income ward vs. lower income; urban vs. rural, etc.). Discussions took from 1.5 to 2.5 hours and were conducted in Swahili.

The team conducted 70 key informant interviews (58 men, 12 women) with a range of stakeholders, including government staff from LGA, regional, and national levels (e.g., Ministry of Finance, PMO-PO-RALG, POPSM), international development partners, and program staff. Stakeholders were selected based on program exposure and to represent different sectors (although more heavily in the health sector). At the LGA level, we selected five to six government stakeholders per each of the 9 LGAs for a total of 42, one in each of the three regions (Regional Secretariat), and 14 at the national level, across the technical areas of HR, finance, health services, and governance and citizen engagement. Program staff were selected based on their in-depth knowledge of the program components—IS, HR, finance, and governance and citizen engagement. We interviewed 11 program staff—five in the clusters plus six at the national level. KIIs lasted from 30 to 60 minutes. KIIs were conducted mainly in Swahili but some, mostly national level, were conducted in English. See Table 4 for the KII sampling plan.

Table 4. Sampling results for key informant interviews

Stakeholder Type	Level	Subtotal
Program	Cluster	5
	National	6
Subtotal		11
Government	LGA	42
	Regional Secretariat	3
	National	14
Subtotal		59
Total		70

Researchers used several tools of the Grounded Theory approach, namely inductive coding, and constant comparison of codes, themes, and resultant theoretical models. Pure Grounded Theory methods were not applicable, as this research began with some preconceived hypotheses and orientation related to systems strengthening.

After community FGDs and stakeholder KIIs, the audio tapes were transcribed and translated by the interviewers. Stakeholder REM FGDs were not audio-recorded but detailed workshop notes were taken and transcribed and photos of mind maps were taken.

Data from completed transcripts was entered into Dedoose, a qualitative data software program. Mind map data was entered into the MinJet program. Researchers coded the transcripts from KIIs and FGDs and data from REM maps using a combination of deductive codes stemming from the logic model and research questions and inductive codes that emerged through the data collection and initial transcript and map review processes. Broad code categories were used, rather than detailed, line-by-line coding. Matrices were next developed to compare themes across sites and other variables, such as status as a control versus program area, types of informants/participants, and status as a Phase 1 versus 2 LGA. Lastly, researchers synthesized the results into an initial draft report of qualitative findings. Matrices and selected transcripts were then reread to confirm draft findings and adjustments in the text were made as needed to develop the current version.

2.3. Ethical Considerations

Prior to quantitative and qualitative data collection, ethical clearance for the study protocol and data collection instruments was obtained from the National Institute for Medical Research in Tanzania and the University of North Carolina (UNC) at Chapel Hill Institutional Review Board (IRB), where required. An exemption was received from the UNC IRB for the quantitative protocol given that the project was limited to analysis of secondary data at the LGA level. No individual identifiers were collected from respondents who participated in qualitative interviews in order to ensure confidentiality. Informed consent was obtained from all participants in qualitative research.

In addition, all non-Tanzanian researchers obtained a research permit from the Tanzania Commission for Science and Technology (COSTECH). We also received additional clearance and research approval from the Tanzania National Bureau of Statistics and the Presidents' Office Regional Administration and Local Government (TAMISEMI).

3. FINDINGS

3.1. Quantitative Evaluation: Evaluation Questions 1 and 3

This section provides answers to evaluation questions 1 and 3:

- Evaluation question 1: In PS3 regions, to what extent has the uptake of health services changed over time?
- Evaluation question 3: Are there differences in the changes over time observed in certain groups of LGAs, in particular, between Phase 1 and Phase 2 LGAs?

Questions 1 and 3 are answered examining the time trends of key health service utilization indicators in PS3 regions and in the other (non-PS3) regions of the country. The graphs in this section present the trajectory of the quarterly weighted average of different service utilization indicators for the LGAs in those two groups (PS3 and other regions). Time series quarterly data, largely from the first quarter of 2014 (2014Q1) to the last quarter of 2018 (2018Q4), were obtained from the DHIS2 routine information system for each LGA of the country. For a few indicators we included quarters in 2013 as the data were available. The weights used were the LGA female population for 2015. The graphs allow us to visualize the evolution, over time, of key health utilization indicators for those two groups of LGAs before PS3 started; that is, from 2014 to mid-2015, and during the time PS3 has been active—from the third quarter of 2015 to the end of 2018. We have also included, where applicable, qualitative information gathered on the context and perception of these trends (for evaluation questions 4 and 5). Additional qualitative results are presented in section 3.3.

Figure 4. Antenatal care coverage before 12 weeks gestational age

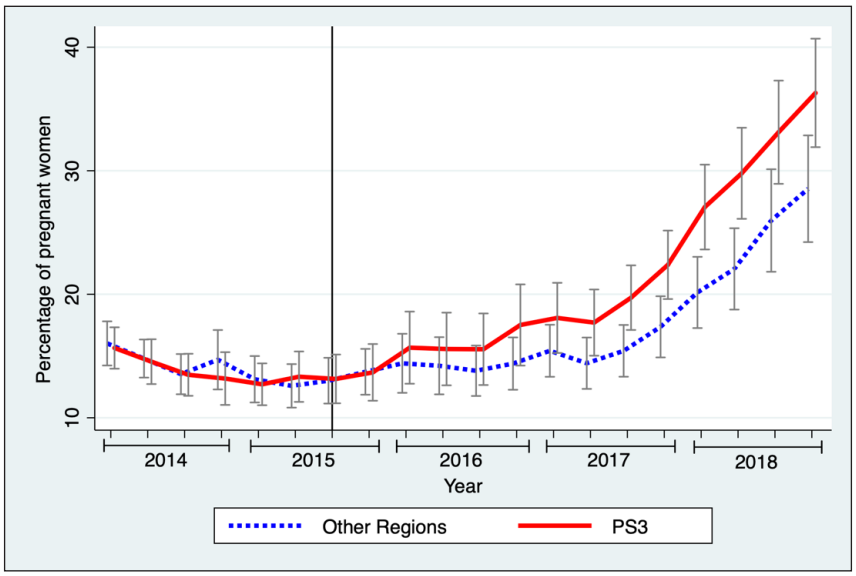


Table 5. Annualized average change in the percentage of pregnant women starting antenatal care before 12 weeks of gestation (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	-1.99**	+6.72**	+8.71**	0.000
– Phase I	-1.86	+7.26**	+9.11**	0.000
– Phase II	-2.05**	+6.49**	+8.55**	0.000
Other	-2.41*	+4.12**	+6.53**	0.000
Difference (PS3 – Other)			+2.18	0.183
Difference (Phase I – Phase II)			+0.56	0.792

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 169 in 2016; PS3: 87 LGAs (Phase I: 25; Phase II: 62); Other: 82 LGAs.

Figure 4 and Table 5 present the time trends and annualized change for ANC initiated before 12 weeks of gestation; that is, during the first trimester of pregnancy. As seen in the graph, during the period from 2014 to mid-2015, the indicator had low (less than 15%) and declining levels in both PS3 and other regions (as shown in the second column of Table 5, the indicator was declining at a rate of almost -2 percentage points per year in PS3 regions and at about the same rate of -2.41 percentage points in other regions.) The trend changed after mid-2015 from a low level below 15 percent in the country, to over double in PS3 areas and almost double in other regions by the end of 2018. Table 5's third column shows positive and significant increasing annual growth rates in this indicator during the PS3 active time interval in both areas. However, there are no significant differences in the rates of change between PS3 and other regions. Figure B.1 in Appendix B shows that time trends in Phase 1 regions were similar to Phase 2 LGAs' trends.

Tanzania's target for ANC initiation <12 weeks is 70 percent by 2020. There have been efforts to improve community outreach activities to encourage women to attend clinics and reinforce the value of ANC for safe motherhood since 2015, when the last DHS showed this indicator at only 24 percent of all pregnant women. The five-year USAID Boresha Afya project, started in 2016, is one of the largest interventions supporting integrated service delivery at the health facility and community levels across the country. Similar projects have rolled-out in other regions, possibly contributing to the increasing trends in PS3 and other regions in 2017 and 2018.

> *Another thing which I can talk about the health service is that we have World Vision which has created awareness to community in general. It has helped to create awareness to leaders and citizens, and it has selected a group to visit households door to door in order to sensitize women, children, and pregnant women so that they encourage women and children to attend clinics for their health.* [KII with women, other]

Figure 5. Pregnant women attending antenatal care 4+ times

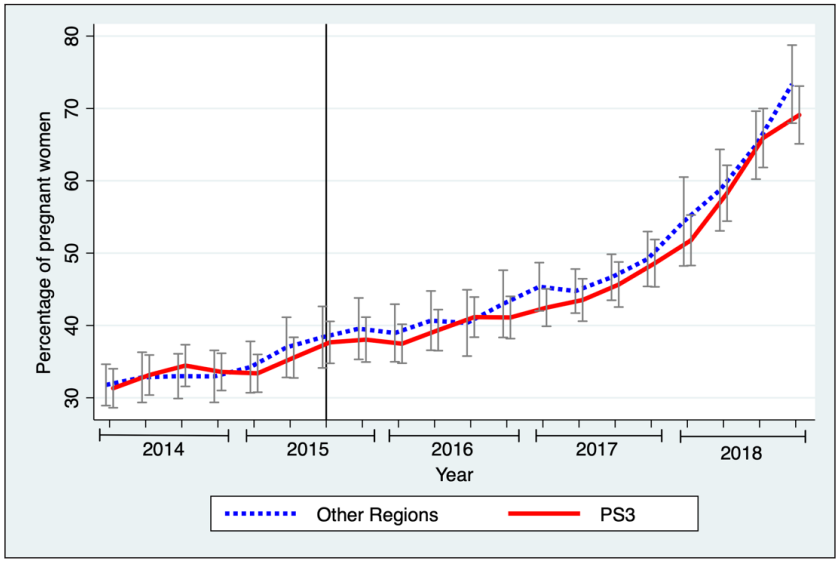


Table 6. Annualized average change in the percentage of pregnant women with at least four antenatal care visits (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+2.40*	+9.07**	+6.67**	0.000
– Phase I	+0.12	+9.27**	+9.15**	0.000
– Phase II	+3.34**	+8.98**	+5.64**	0.000
Other	+3.44**	+9.31**	+5.87**	0.008
Difference (PS3 – Other)			+0.79	0.754
Difference (Phase I – Phase II)			+3.51	0.165

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 161 in 2016; PS3: 84 LGAs (Phase I: 24; Phase II: 60); Other: 77 LGAs.

Figure 5 and Table 6 present the time trends and annualized change in the percent of women attending at least four ANC visits. Prior to the PS3 implementation period, less than 40 percent of pregnant women in both PS3 and other regions had at least four ANC visits, however this indicator significantly increased by 2.4 and 3.44 percentage points per year within PS3 and other regions, respectively. During the PS3 active period there were positive and significant growth rates in both regions, exceeding 9 percentage points per year in both PS3 and other regions. There were no significant differences, however, in the annual growth rates of this indicator, before and after PS3 initiation, for PS3 and other regions. At the end of 2018, just under 70 percent of pregnant women attended ANC four times in PS3 regions, and just over 70 percent attended in other regions. Phase 1 and Phase 2 areas follow similar patterns over time (Figure B.2, Appendix B).

Improvements in access to services by pregnant women were attributed qualitatively to various program and contextual factors, including construction of additional health facilities, funding for ambulances, and improved roads for transport. Many of these contextual factors were addressed by local government councilors as part of improved governance, as discussed in section 3.3.1. Community members also discussed the improvement in primary services themselves as motivation for increased attendance.

> *Our district hospital has improved services for pregnant women and children. They used to come regularly or twice [a] week specifically for pregnant women and children, which means the targeted group did not feel compelled to go to the hospital. They realized the challenge and worked on it. They do the same in another distant village.*
> [FGD with men, other]

Figure 6. Prevalence of pregnant women receiving iron and folic acid supplementation

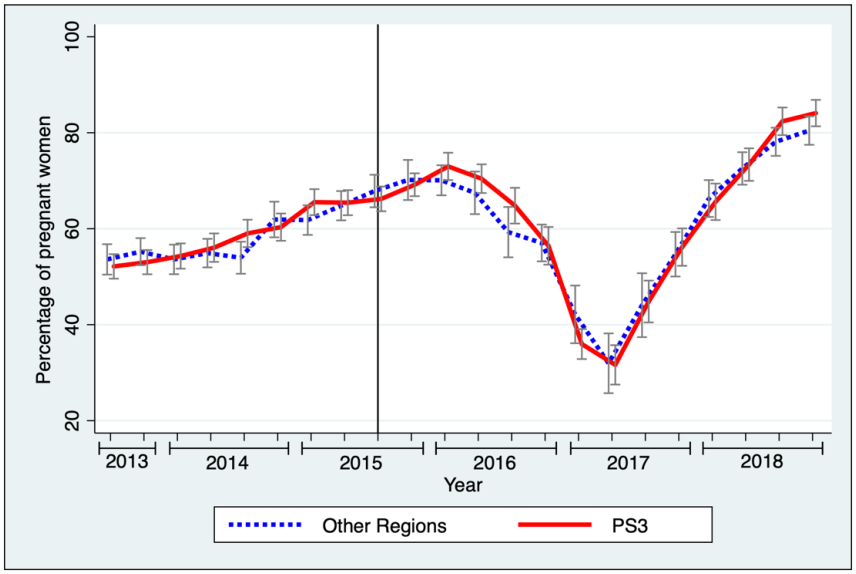


Table 7. Annualized average change in percentage of pregnant women given iron and folic acid supplementation (in percentage points)

LGAs	Before PS3 2013Q3 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+8.41**	+2.27**	-6.14**	0.000
– Phase I	+6.68**	+2.13	-4.55	0.058
– Phase II	+9.11**	+2.32**	-6.79**	0.000
Other	+6.44**	+1.70*	-4.75**	0.002
Difference (PS3 – Other)			-1.39	0.463
Difference (Phase I – Phase II)			+2.24	0.407

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 6 and Table 7 show the time trends and annualized change in the percentage of iron and folic acid supplementation (IFA) among pregnant women. Prior to PS3 initiation, levels of this indicator were increasing at 8.41 and 6.44 percentage-points per year for PS3 areas and other regions, respectively. By the middle of 2015, both PS3 and other regions had about 70 percent of pregnant women receiving IFA. During the PS3 active period, there was a steep, universal decline in this indicator for all areas from early 2016, hitting a minimum prevalence of around 30 percent in mid-2017. Within PS3, Phase 1 and Phase 2 trends followed similar pattern (Figure B.3, Appendix B). This decline rapidly recovered, exceeding the prior peak levels within about a year. Reflecting these trends, the annual increase during the PS3 active period was significantly lower in contrast to before PS3 yearly changes for all areas. However, changes in PS3 regions were not significantly different to those in other regions.

The annual health sector performance profile (AHSP) reports, which explain factors influencing health service indicators, does not make a specific mention of folic acid supplementation. However, the 2017/2018 AHSP report notes challenges of low stocks and, for some facilities, stockouts of vaccines and other essential medicines, which may have applied to this indicator as well. It is noted, for instance, that in 2016, the government funded only 60 percent of the approved budget for immunization commodities (AHSP, 2016).

These budget constraints and stockouts were felt at the community level. However, systems like those put in place by PS3 and the GOT have helped monitor and account for these issues, as noted by one medical officer:

> *Big changes are such as having information at the Municipal on how much medicine has been used, the amount used, average consumption within a month, budget, the stock, and ability to press order for the next time. Also creating emergency order if you have finished your stock. They have also helped us with inventory control system which are now installed in our health centers which we didn't have before, so that health center can order medicines for six months and if the stock is about to finish even within three months, they can press order for more. So, we have the system at the Municipal level and Regional level so that you make sure you are not out of stock*
> [KII with town medical officer, Phase 2]

Figure 7. Pregnant women receiving TT2+ vaccination at antenatal care

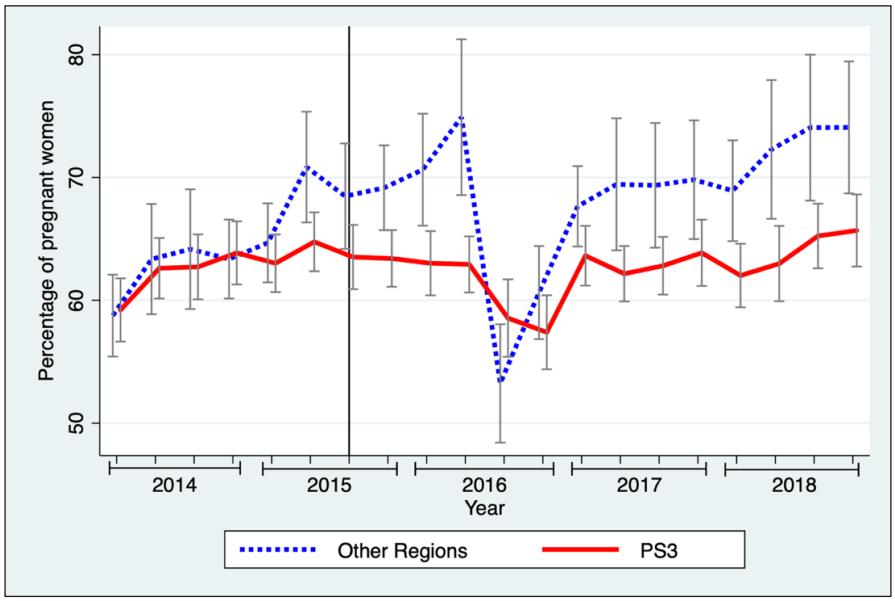


Table 8. Annualized average change in percentage of pregnant women receiving TT2+ vaccine (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+3.44**	+0.72	-2.72**	0.005
– Phase I	+3.87*	+0.34	-3.53*	0.030
– Phase II	+3.27**	-0.88*	-2.38*	0.046
Other	+7.28**	+1.87**	-5.41**	0.000
Difference (PS3 – Other)			+2.69	0.059
Difference (Phase I – Phase II)			-1.15	0.567

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 181; PS3: 90 LGAs (Phase I: 25; Phase II: 65); Other: 91 LGAs.

Figure 7 and Table 8 show the time trends and annualized average change in the proportion of pregnant women receiving at least two doses of the tetanus toxoid vaccine (TT2+). From 2014 to the middle of 2015, the TT2+ indicator rose by 3.44 and 7.28 percentage points annually in PS3 and other regions, respectively. By the middle of 2015, about 65 percent of pregnant women in PS3 regions and 70 percent in other regions received TT2+. During the PS3 active period, there was some volatility in this indicator, especially in other regions, with a steep decline during 2016 followed by an overall recovery, attaining mid-2015 levels by the end of 2018. Generally, there was no significant change over the PS3 active period in PS3 areas, however, there was a significant, but small, decline in Phase 2 areas (Figure B.4, Appendix B). The change in other regions was significant during this period, at 1.87 percentage points per year. Comparing the trends before and during PS3, the differences in the growth rates was significant for PS3 and other regions, at -2.72 and -5.41 percentage points, respectively. Nevertheless, the difference in the changes over time between both areas was not significant.

Figure 8. Women tested for anemia at antenatal care

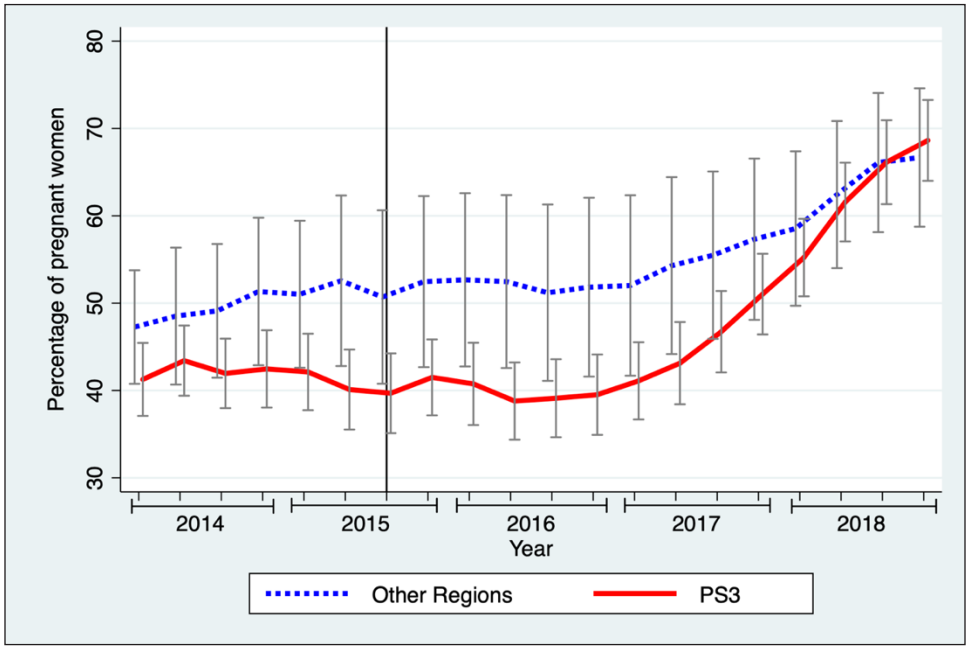


Table 9. Annualized average change in the percentage of pregnant women tested for anemia at antenatal care (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	-1.05**	+9.08**	+10.13**	0.000
– Phase I	-0.65	+11.34	+11.99**	0.000
– Phase II	-1.21	-8.16**	+9.37**	0.000
Other	+4.14*	+4.68**	+0.54	0.835
Difference (PS3 – Other)			+9.59**	0.001
Difference (Phase I – Phase II)			+2.62	0.417

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 8 and Table 9 show the time trends and annualized change in the proportion of pregnant women tested for anemia. Figure 8 shows that initial levels of anemia testing were lower in PS3 regions than in other regions. The annualized change prior to PS3 implementation was -1.05 and 4.14 percentage-points for PS3 and other regions, respectively. During the PS3 active period, the gap lessened toward the end of 2016. By the end of 2018, PS3 regions had slightly higher levels of anemia testing than other regions, at almost 70 percent. The two implementation phases followed these similar patterns and trends, but Phase 1 LGAs had consistently lower levels of this indicator than Phase 2 LGAs (Figure B.5, Appendix B). During this time, this indicator grew, on average, by 9.08 percentage points per year in PS3 regions and 4.68 percentage points per year in other regions. Comparing the two time points, other regions' growth rates did not change, but PS3 regions' rates were 10.13 percentage points higher during the PS3 period. The difference between the two times was 9.59 percentage points higher in PS3 regions compared with other regions, which was a significant difference.

Figure 9. Women tested for syphilis at antenatal care

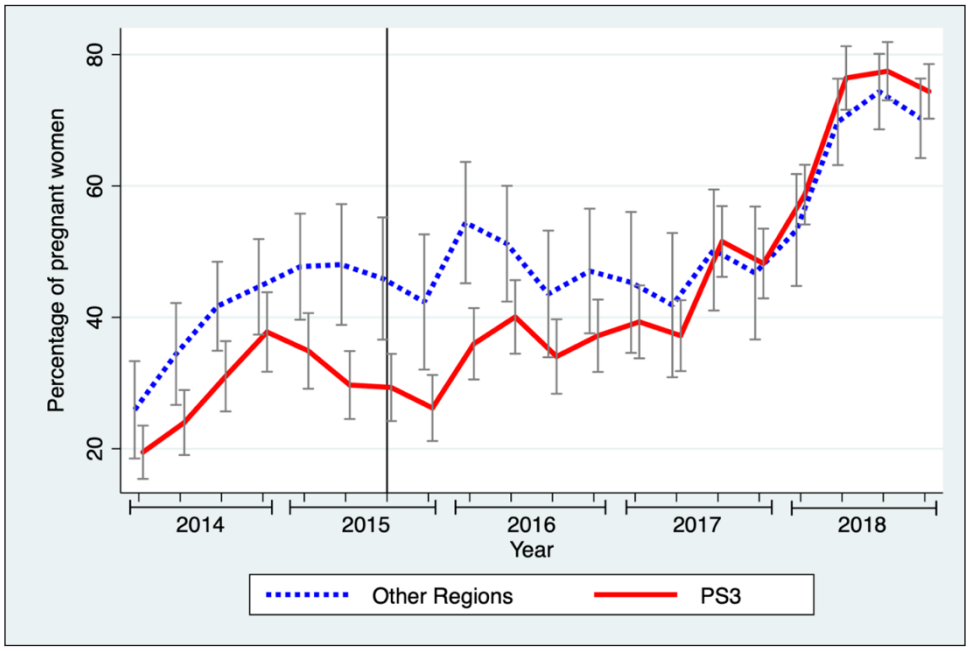


Table 10. Annualized average change in percentage of pregnant women tested for syphilis at antenatal care (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+10.32**	+15.44**	+5.12*	0.024
– Phase I	+4.93	+18.04**	+13.11**	0.001
– Phase II	+12.52**	+14.38**	+1.87	0.482
Other	+17.53**	+7.42**	-10.12**	0.001
Difference (PS3 – Other)			+15.24**	0.000
Difference (Phase I – Phase II)			+11.25*	0.017

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 9 and Table 10 show the time trends and annualized change in percentage of pregnant women tested for syphilis. Figure 9 shows that initial levels of testing were lower in PS3 regions than other regions, with an increase followed by a decline, which was less extreme in other regions. The annualized change prior to PS3 implementation was 10.32 and 17.53 percentage points for PS3 and other regions, respectively. During the PS3 active period, the gap lessened, so that by the end of 2018, PS3 regions had slightly higher levels of anemia testing than other regions, at about 75 percent. The two implementation phases followed these similar patterns and trends, but Phase 1 LGAs had consistently lower levels of this indicator than Phase 2 LGAs until converging in 2017 (Figure B.6, Appendix B). During this time, this indicator grew, on average, by 15.44 percentage points per year in PS3 regions, and 7.42 percentage points per year in other regions. Comparing changes across the time periods, indicator growth rates were 5.12 percentage points higher in PS3 regions, and 10.12 percentage points lower in other regions. The difference between the two time periods was 15.24 percentage points higher in PS3 regions compared with other regions, which was a significant difference. The increase in the average rate of syphilis testing in Phase 1 LGAs was also significantly higher—by 11.25 percentage points—compared with Phase 2 LGAs.

Figure 10. Deliveries taking place in health facilities

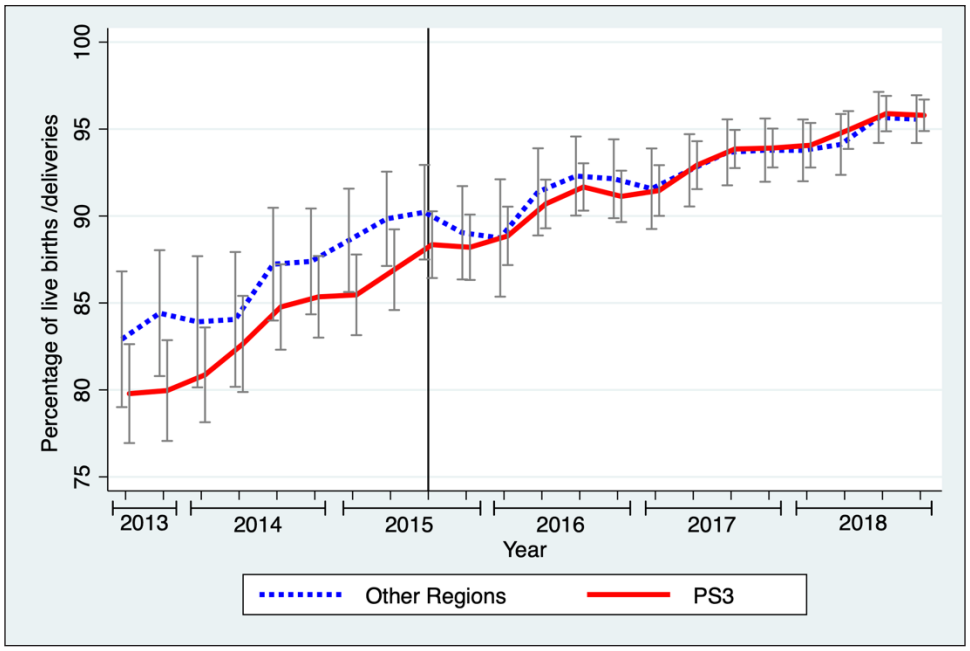


Table 11. Annualized average change in the percentage of deliveries occurring in health facilities (in percentage points)

LGAs	Before PS3 2013Q3 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+4.43**	+2.47**	-1.96**	0.000
– Phase I	+4.67**	+3.22**	-1.46	0.220
– Phase II	+4.33**	+2.16**	-2.17**	0.000
Other	+3.95**	+1.94**	-2.01**	0.003
Difference (PS3 – Other)			+0.05	0.954
Difference (Phase I – Phase II)			+0.71	0.595

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 10 and Table 11 show the time trends and annualized change in the percentage of births delivered in health facilities. Prior to the middle of 2015, PS3 regions had lower levels of health facility deliveries than other regions; however, both areas displayed increasing trends over this time. PS3 regions were increasing at 4.43 percentage points annually and other regions were increasing by 3.95 percentage points—changes in both areas were statistically significant. During the PS3 active period, the increasing trend was 2.47 and 1.94 percentage points for PS3 and other regions, respectively. Differences in the annualized trends before and during PS3 were not significantly different when comparing PS3 and other regions. At the end of 2018, just over 95 percent of live births occurred in health facilities in both PS3 and other regions. In terms of the implementation phase, Phase 1 areas had lower initial levels of this indicator than Phase 2, but both PS3 phases converge at a similar level (Figure B.7, Appendix B).

The results for this indicator, whose performance has been improving, are also supported by qualitative findings. Several community members and key informants from PS3 and other regions commented on the challenges of delivering in facilities in the past and ongoing improvements.

> *In the past, mothers refused to give birth at the hospital…but, after being educated, the majority attends clinics instead of visiting witch doctors. This is what I can say about changes.* [FGD with women, other]

The convergence of the PS3 and other regions' trajectories from 2017 may reflect the effect of other ongoing programs, such as USAID Boresha Afya, which supports integrated community and health facility level service provision, and Amref which primarily works in the Lake Zone.

> *Amref helped educate pregnant women who used to deliver at home and not at the health centres. But they have also helped women and nowadays they conduct a lot of seminars even in the market places with ones that I witnessed. Women are now delivering at the health centers and focusing more on the life of mother and child.*
> [KII with councilor, other]

Figure 11. Births delivered by skilled attendants

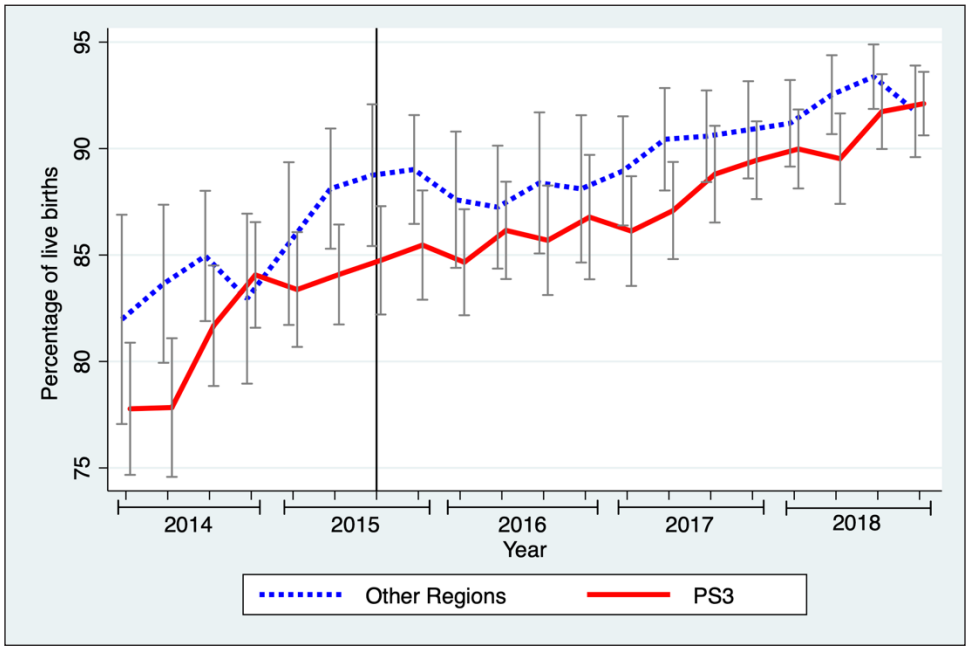


Table 12. Annualized average change in the percentage of births delivered by skilled birth attendants (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+5.79**	+2.29**	-3.50**	0.004
– Phase I	+5.04*	+3.10**	-1.95	0.446
– Phase II	+6.10**	+1.97**	-4.13**	0.002
Other	+3.94**	+1.58**	-2.35	0.078
Difference (PS3 – Other)			-1.14	0.525
Difference (Phase I – Phase II)			+2.19	0.448

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 11 and Table 12 show the time trends and annualized change in the percentage of births delivered by skilled birth attendants (SBAs). Prior to the middle of 2015, PS3 regions had lower levels of SBA deliveries than other regions (except for the fourth quarter in 2014). Similar to the health facility delivery indicator, both areas displayed increasing trends over this time, converging in 2018. Table 12 shows statistically significant increases prior to mid-2015, with annualized changes of 5.79 percentage points for PS3 and 3.94 for other regions. During the PS3 active period, the increasing trend reduced to 2.29 and 1.58 percentage points for PS3 and other regions, respectively. Differences in the annualized trends before and during PS3 did not significantly differ between PS3 and other regions. At the end of 2018, SBAs delivered about 93 percent of live births in both PS3 and other regions. As for the implementation phases, similarly to the facility delivery indicator, Phase 1 LGAs had lower initial levels of this indicator than those in Phase 2, but both PS3 phases started to converge by the end of 2018 (Appendix B, Figure B.8).

While trends have increased overall, some community members still perceive a shortage of health attendants at facilities, particularly among other regions where PS3 was not active.

> *When a woman is pregnant, she must attend the clinics. There are very few nurses who can help these women to deliver successfully. Sometimes, when you go to the hospital, you find a very long queue for consultation. That means doctors are not enough here.* [FGD with women, other]

Figure 12. Mothers receiving postnatal care before 7 days

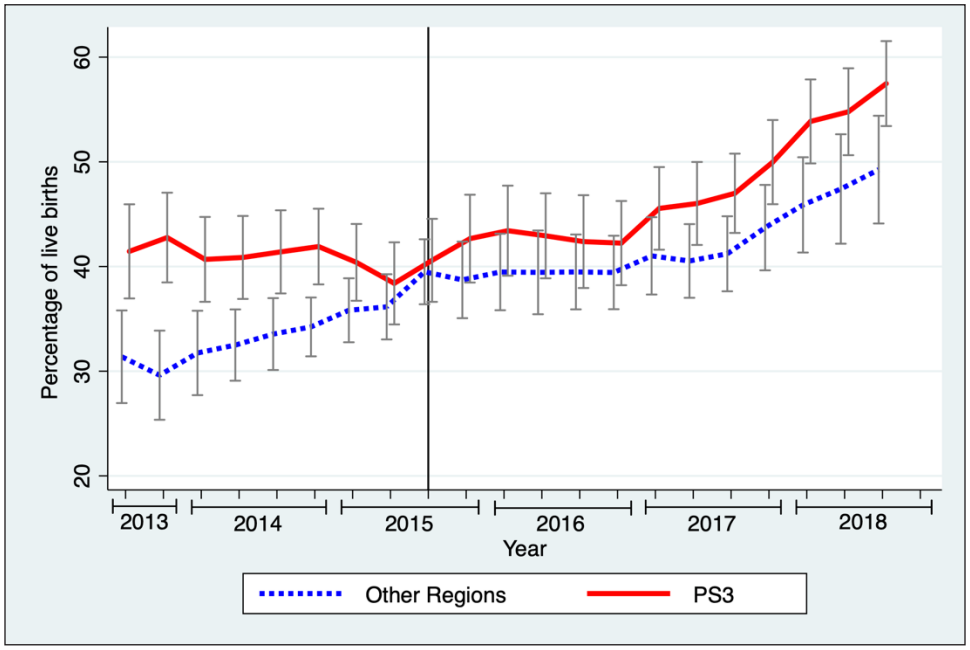


Table 13. Annualized average change in the percentage of mothers who received postnatal care within 7 days of delivery (in percentage points)

LGAs	Before PS3 2013Q3 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q3 (2)	Difference (2)-(1)	P-value of difference
PS3	-1.39	+5.22**	+6.61**	0.000
– Phase I	-0.39	+6.06**	+6.45*	0.044
– Phase II	-1.78	+4.88**	+6.66**	0.001
Other	+3.46**	+3.19**	-0.27	0.878
Difference (PS3 – Other)			+6.88**	0.006
Difference (Phase I – Phase II)			-0.21	0.957

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 12 and Table 13 show the time trends and annualized change in the percentage of deliveries in which the mothers received postnatal care (PNC) within seven days of giving birth. From the end of 2013 until the start of 2015, PS3 regions had higher levels of PNC compared to other regions. There was no significant change in PNC prior to mid-2015 for PS3 regions, however, in other regions, the average annual increase of 3.46 percentage-points was significant. During the PS3 active period, PS3 regions had an annual increase in PNC of 5.22 percentage points, and other regions averaged a yearly increase of 3.19 percentage points. There was a statistically significant 6.61 percentage point increase in the growth rate of PNC in PS3 regions when comparing during and prior to PS3 implementation. The equivalent change in the growth rate of PNC in the other regions was not significant. Comparing the two time periods, the change in the growth rate in PS3 regions was significantly higher than other regions, at 6.88 percentage points. Phase 1 areas had overall higher PNC levels than Phase 2 areas, but the trends over time followed a similar pattern (Figure B.9, Appendix B), and differences between the two implementation phases were not significant.

Overall improvements in this indicator can be linked to observed improvements in health facility delivery rates. The reasons for the differences between the two categories of regions are not apparent.

Figure 13. Prevalence of low birth weight

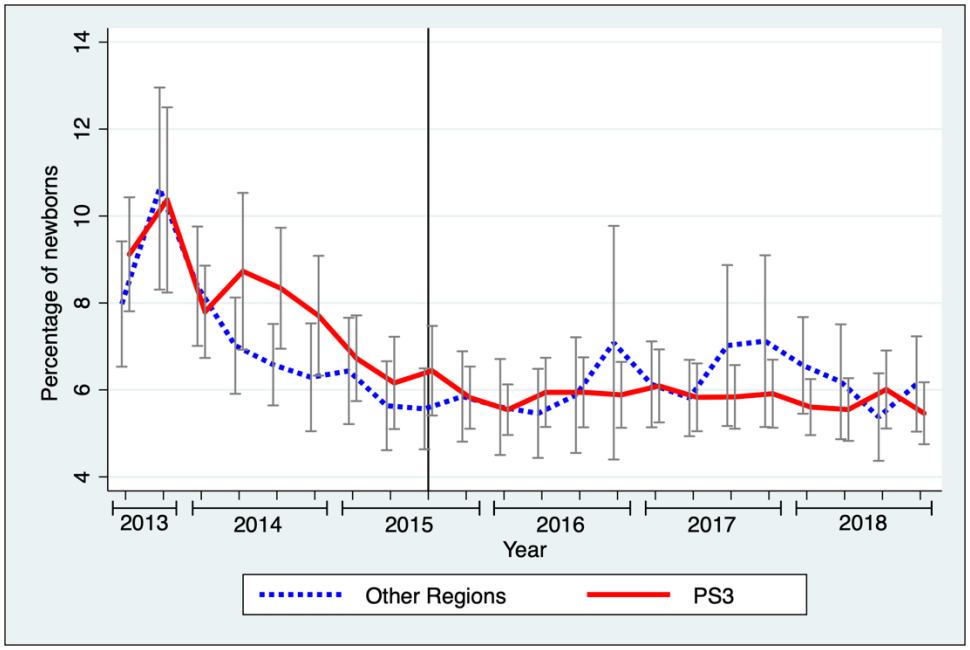


Table 14. Annualized average change in percentage of newborns with low birth weights (in percentage points)

LGAs	Before PS3 2013Q3 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	-1.89**	-0.12	+1.76**	0.000
– Phase I	-1.51*	-0.55**	+0.96	0.168
– Phase II	-2.04**	+0.06	2.10**	0.000
Other	-2.11**	+0.18	+2.30**	0.000
Difference (PS3 – Other)			-0.53	0.413
Difference (Phase I – Phase II)			-1.13	0.203

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Table 13 and Figure 14 show the time trends and annualized change in the prevalence of infants born with a low birth weight (LBW). Figure 13 shows that, prior to PS3 initiation, LBW had declined from around 10 percent in 2013 to close to 7 percent in the second quarter of 2015 in PS3 and other regions. The annualized change during this period was -1.89 and -2.11 percentage-points for PS3 and other regions, respectively. During the PS3 active period, there was very little change in the time trends or annualized change in this indicator. The only significant difference was among Phase 1 PS3 LGAs, which declined from mid-2015 to the end of 2018 by 0.55 percentage points per year (Figure B.10, Appendix B). The rate at which LBW prevalence significantly declined was similar, comparing before and after PS3 initiation for both areas. However, the LBW decline rates in PS3 and other regions did not significantly differ.

Figure 14. Measles vaccination coverage

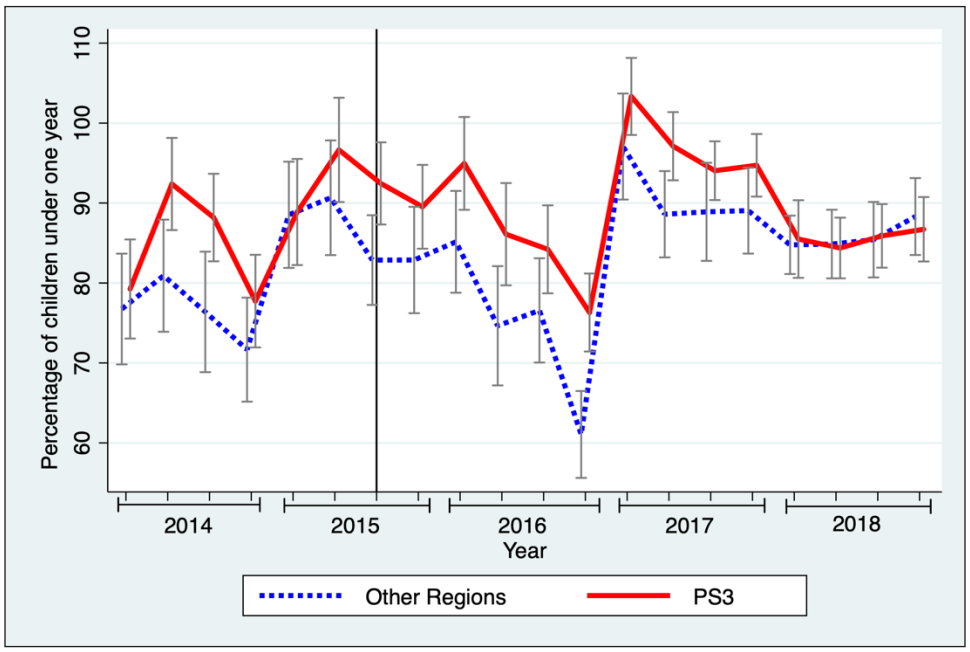


Table 15. Annualized average change in the percentage of children under one year of age who have been vaccinated against measles (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+7.57**	-1.07**	-8.64**	0.000
– Phase I	+5.17	+2.27	-2.91	0.471
– Phase II	-8.51**	-2.40*	-10.91**	0.000
Other	+9.98**	+2.56*	-7.41*	0.013
Difference (PS3 – Other)			-1.22	0.752
Difference (Phase I – Phase II)			+8.00	0.108

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 171; PS3: 85 LGAs (Phase I: 23; Phase II: 62); Other: 86 LGAs.

Figure 14 and Table 15 show the time trends and annualized change for the prevalence of measles vaccinations. For measles vaccination there was some volatility during 2014 and the first part of 2015, but an overall increasing trend. Table 15 shows statistically significant increases prior to mid-2015, with annualized changes of 7.57 percentage points for PS3 and 9.98 for other regions. A substantial drop in measles provision occurred nationwide in 2016. Phase 2 LGAs had higher levels of measles vaccinations than Phase 1 between mid-2015 to mid-2016; however, by the fourth quarter of 2016, both Phase 1 and Phase 2 LGAs had similar levels (Figure B.11, Appendix B). This national drop was likely due to system-level supply problems. Measles vaccination provision recovered in early 2017 to high levels of close to 100 percent and the time trend returned to a relatively stable level during 2018. The time trends and volatility over time are similar in PS3 and other regions. During the PS3 active period, there was a decreasing trend reduced of -1.07 percentage points yearly in PS3 regions and an increasing trend of 2.56 percentage points in other regions. Differences in the annualized trends before and during PS3 did not significantly differ between PS3 and other regions.

In addition to the immunization commodity shortages already noted, immunization data may be prone to quality problems. There are potential challenges with data accuracy (double-reporting) and appropriate denominators (for example, denominators for the health facility catchment area and outside areas, as used in the DHIS2), which complicates the interpretation of this and other immunization indicators.

Figure 15. Penta3 vaccination coverage

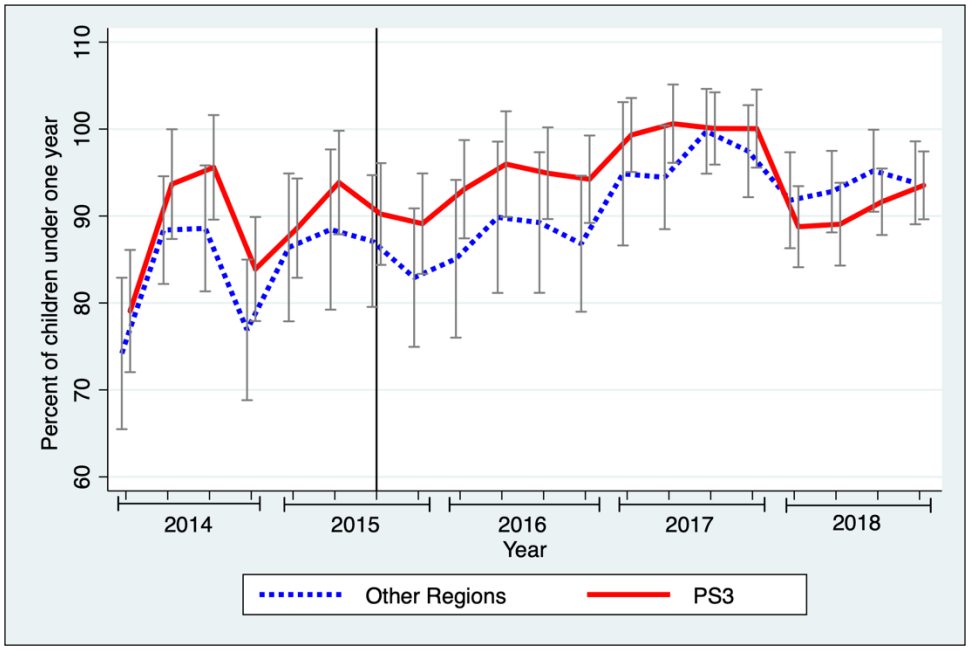


Table 16. Annualized average change in the percentage of children under one year of age who have had Penta3 vaccinations (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+5.43**	0.19	-5.23*	0.012
– Phase I	+6.03**	+3.10	-2.93	0.226
– Phase II	-5.17*	-1.01	-6.18*	0.025
Other	+6.15*	+3.28	-2.86	0.454
Difference (PS3 – Other)			-2.36	0.588
Difference (Phase I – Phase II)			+3.25	0.377

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 171; PS3: 85 LGAs (Phase I: 23; Phase II: 62); Other: 86 LGAs.

Figure 15 and Table 16 show the time trends and annualized average changes in the percentage of children under one year of age receiving the Penta3 vaccination. As with the other commodity-based indicators, Figure 15 illustrates some volatility that may be related to supply shortages. Prior to the middle of 2015, PS3 and other regions had significant annual average increases in Penta3 prevalence, except for Phase 2 LGAs (Figure B.12, Appendix B). Although PS3 regions achieved about 100 percent of children vaccinated in 2017, there was a sharp decline across all areas in 2018 that has resulted in very little average change over the PS3 active period for both PS3 and other regions. These trends seemed to have occurred at a national level, as there was very little difference between the two time periods comparing PS3 and other regions.

2017/2018 AHSP notes that there had been a shortage of immunization commodities, potentially explaining the drop seen in 2018. The report also notes the need to improve community sensitization and engagement for improved uptake of immunization services.

Figure 16. Antenatal care partners' HIV testing rates

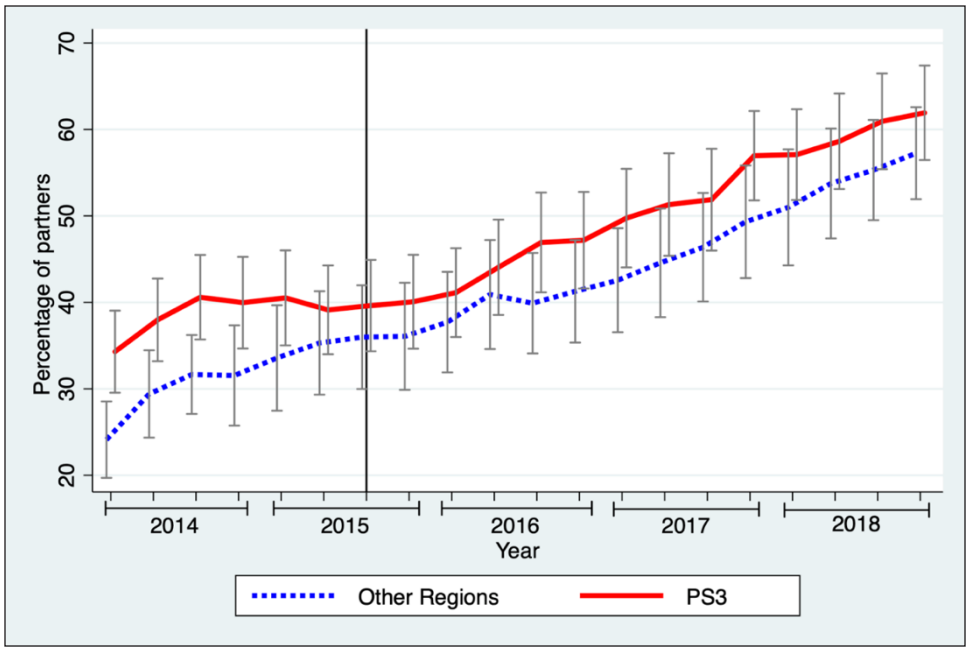


Table 17. Annualized average change in antenatal partners' HIV testing rates (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+3.56	+7.34**	+3.77	0.068
– Phase I	+5.37	+8.54**	+3.17	0.432
– Phase II	+2.83	+6.84**	+4.01	0.095
Other	+7.81**	+6.75**	-1.06	0.528
Difference (PS3 – Other)			+4.83	0.070
Difference (Phase I – Phase II)			-0.84	0.858

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 16 and Table 17 show the time trends and annualized average change in ANC partners' HIV testing rates. The figure shows both PS3 and other regions increasing over time, with PS3 regions increasing at a higher level than other regions throughout the pre-program and program stages. Prior to mid-2015, other regions had averaged a greater annual increase, at 7.81 percentage points, than PS3 regions, at 3.56 percentage points. The annual increase prior to PS3 implementation was significant for other regions, but not significant for PS3 regions. During the PS3 active period, both PS3 and other regions had significant average yearly increases, at 7.34 and 6.75 percentage points, respectively. The differences in the annual increases over time, comparing before and during the PS3 active period, were not significant for either PS3 or other regions. Furthermore, the difference between the two areas and the two time periods was also not significant. At the end of 2018, the average ANC partners' HIV testing rate was just over 60 percent for PS3 regions, and about 55 percent for other regions. Within PS3 regions, Phase 1 and Phase 2 followed similar patterns; however, the levels of this indicator for Phase 1 LGAs were higher, reaching almost 70 percent in late 2018, compared with Phase 2 LGAs, which averaged at just below 60 percent (Figure B.13, Appendix B).

Figure 17. HIV-exposed infants receiving first HIV test within 2 months after birth

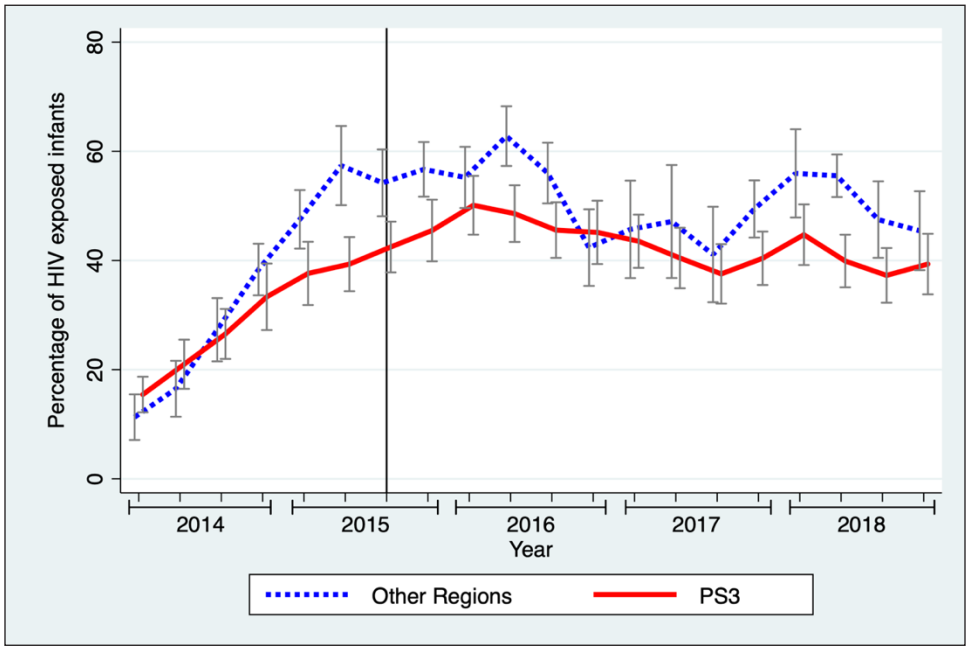


Table 18. Annualized average change in percentage of HIV-exposed infants receiving first HIV test within 2 months after birth (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+20.08**	-2.70**	-22.78**	0.000
– Phase I	+19.04**	-2.48	-21.52**	0.000
– Phase II	+20.50**	-2.79**	-23.29**	0.000
Other	+38.19**	-2.64*	-40.83**	0.000
Difference (PS3 – Other)			+18.06**	0.000
Difference (Phase I – Phase II)			+1.78	0.751

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 181; PS3: 92 LGAs (Phase I: 26; Phase II: 66); Other: 89 LGAs.

Figure 17 and Table 18 show the time trends and annualized average change in the percentage of infants exposed to HIV who received their initial HIV test within two months after birth. At the beginning of 2014, both PS3 regions and other regions had levels of this indicator under 20 percent. The percentage of exposed infants who were tested rose through mid-2015 for both groups, however, this change was more rapid in other regions, with an annualized average increase of 38.19 percentage points, compared with 20.08 percentage points for PS3 regions. After PS3 began, the yearly average growth for this indicator showed that both PS3 and other areas declined from mid-2015 until the end of 2018 at similar but smaller rates, around 2.6–2.7 percentage points per year. Compared to before and during the program, the difference between the growth rates was significant for both areas, with PS3 regions' growth rates being 22.78 percentage points per year lower during the PS3 active period than before mid-2015, and 40.83 percentage points per year lower in other regions. The difference between the two groups over the two time periods was 18.06 percentage points, which also is a statistically significant difference. The reasons for these differences are not apparent. In terms of PS3 implementation, Phase 2 areas had overall slightly higher levels than Phase 1 areas, but both followed similar time trend patterns (Figure B.14, Appendix B).

Figure 18. HIV-exposed infants initiated on cotrimoxazole within 2 months after birth

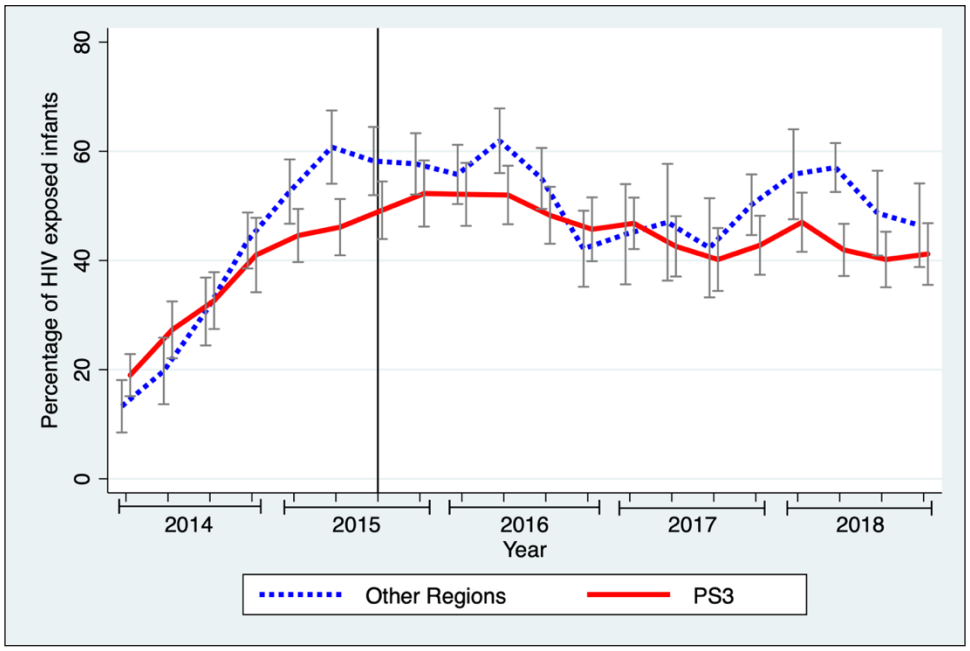


Table 19. Annualized average change in the percent of HIV-exposed infants initiated on cotrimoxazole within 2 months after birth (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+22.4**	-3.62**	-26.02**	0.000
– Phase I	+17.83**	-3.82*	-21.65**	0.000
– Phase II	+24.29**	-3.54**	-27.82**	0.000
Other	+39.88*	-2.68*	-42.56**	0.000
Difference (PS3 – Other)			+16.54**	0.000
Difference (Phase I – Phase II)			+6.17	0.221

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 171; PS3: 89 LGAs (Phase I: 26; Phase II: 63); Other: 82 LGAs.

Figure 18 and Table 19 show the time trends and annualized average change in the percentage of HIV-exposed infants on cotrimoxazole within two months after birth. The data for this indicator follow a similar pattern as the previous indicator on testing of HIV-exposed infants. At the beginning of 2014, both PS3 and other regions had levels of this indicator under 20 percent. The percentage of exposed infants who were tested rose through mid-2015 for both groups, however, this change was more rapid among other regions, with an annualized average change at 39.88 percentage points, compared with 22.4 percentage points for PS3 regions. After PS3 began, the yearly average showed that both areas fell from mid-2015 through 2018 at similar rates, at 3.62 and 2.68 percentage points per year for PS3 and other regions, respectively. Compared to before and during the program, the difference between the growth rates was significant for both areas, with PS3 regions' growth rate differences at -26.02 percentage points during the PS3 active period compared with before mid-2015, and -42.56 percentage points in other regions. The difference between the two groups over the two time periods was 16.54 percentage points, which was also statistically significant. The reasons for these differences are not apparent. In terms of PS3 implementation, Phase 2 areas had overall slightly higher levels than Phase 1 areas, but both followed similar time trend patterns (Figure B.15, Appendix B).

Figure 19. Percentage of couples receiving HIV counseling and testing at antenatal care

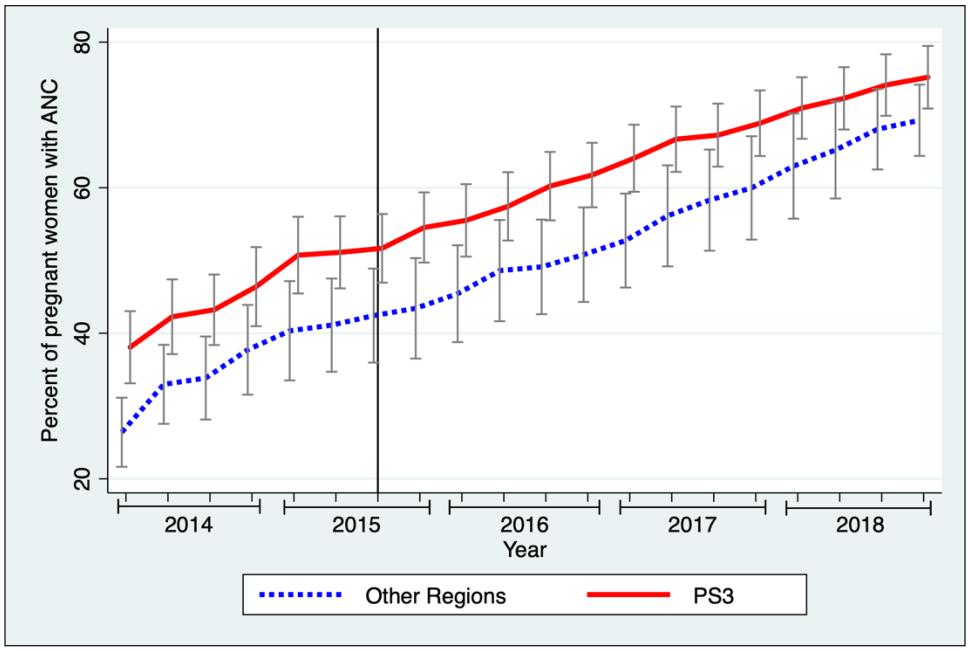


Table 20. Annualized average change in percentage of couples receiving HIV counseling and testing at antenatal care (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+10.71**	+7.29**	-3.42**	0.007
– Phase I	+12.58**	+8.29**	-4.28	0.119
– Phase II	+9.96**	+6.87**	-3.08*	0.027
Other	+11.38**	+8.58**	-2.80	0.102
Difference (PS3 – Other)			-0.62	0.772
Difference (Phase I – Phase II)			-1.20	0.695

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 19 and Table 20 show the time trends and annualized average change in the percentage of couples who received HIV counseling and testing at ANC. Figure 18 shows that, throughout the pre-program and PS3 active periods, PS3 regions had higher levels of couples receiving HIV counseling and testing than other regions. This mirrors the partners' HIV testing rate indicator shown in Figure 16. In PS3 regions, there was an average annualized growth of 10.71 percentage points, and 11.38 percentage points in other regions, prior to the program. During the PS3 active period, the growth rate for PS3 regions significantly fell 3.42 percentage points to a rate of 7.29 percentage points per year. In other regions, the growth rate also fell by 2.80 percentage points to 8.58 percentage points per year, however this result was not significant. There was no significant difference in the change in rates from before and during the program between the two areas. Within the PS3 areas, Phase 1 levels of this indicator were consistently slightly higher than those of Phase 2, and Phase 2 levels were consistently slightly higher than those of other areas (Figure B.16, Appendix B.)

The overall increase in both PS3 and other regions reflects a general perception that partner attendance at ANC has increased, which has resulted in increases in couples' decision-making and partner testing.

> *In the past, women were attending clinics without their husbands. The parents did not share their problems and most men believed that it was not their duty to accompany their wives to the hospital. But, today, men are educated and are ready to accompany their wives and sometimes undergo medical examination. Men and women can now sit together and make decisions on crucial issues like that.* [FGD with women, other]

Figure 20. Contraceptive prevalence rate

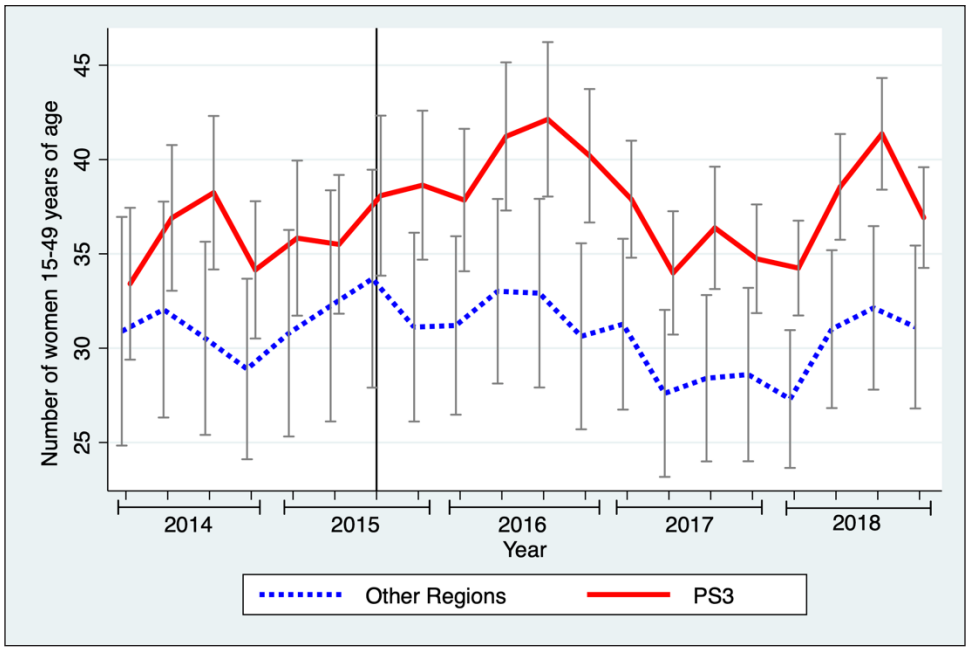


Table 21. Annualized average change in contraceptive prevalence rate (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q4 (2)	Difference (2)-(1)	P-value of difference
PS3	+0.36	-0.69	-1.05	0.362
– Phase I	+0.92	-0.84	-1.75	0.286
– Phase II	+0.11	-0.62	-0.74	0.621
Other	+0.14	-0.80	-0.94	0.529
Difference (PS3 – Other)			-0.11	0.955
Difference (Phase I – Phase II)			-1.02	0.646

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 175; PS3: 87 LGAs (Phase I: 25; Phase II: 62); Other: 88 LGAs.

Figure 20 and Table 21 show the time trends and annualized average changes in the contraceptive prevalence rate (CPR). PS3 regions had a higher average CPR compared to other regions both before and during PS3 implementation. There were no significant annualized changes in the CPR over time or between the two groups. Within PS3 regions, the trends in Phase 1 areas were similar to the trends in Phase 2 areas (Figure B.17, Appendix B.) Reasons for variations between the PS3 and other regions are not apparent.

Traditional gender norms and expectations were discussed as a challenge in contraceptive prevalence and family planning.

> *Now the challenges we face is the small number of those using family planning methods and when you go to the villages and advertise them the men will not allow their women to attend the clinics to get those, if only the women had the decisions on their own it would have been easy.* [KII with DMO, Phase 1]

Figure 21. Health facilities with RCH tracer drugs package

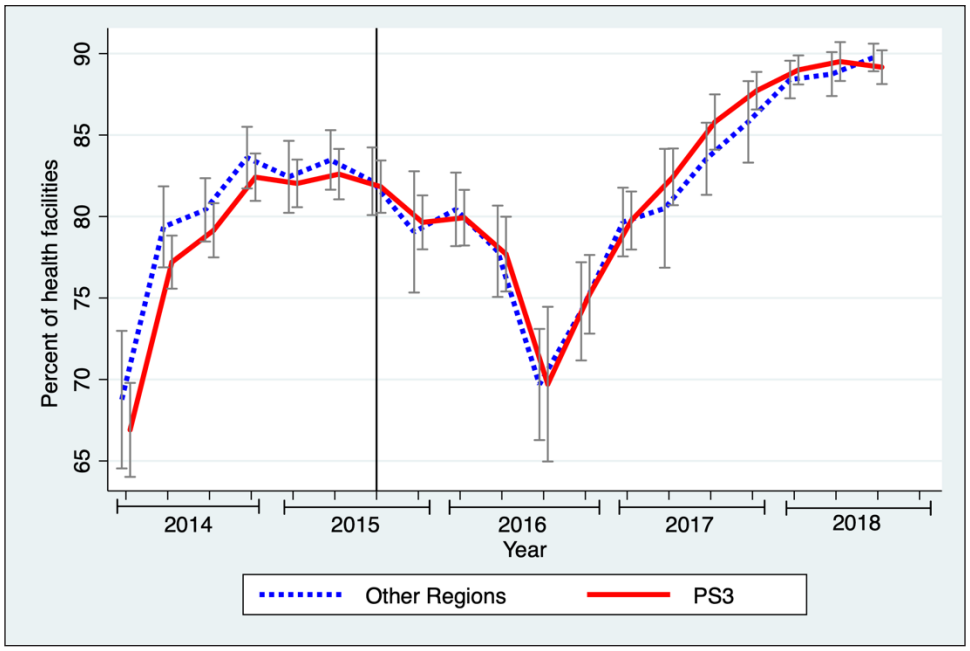


Table 22. Annualized average change in the percentage of health facilities with RCH tracer drugs package (in percentage points)

LGAs	Before PS3 2014Q1 to 2015Q2 (1)	PS3 active 2015Q3 to 2018Q3 (2)	Difference (2)-(1)	P-value of difference
PS3	+11.00**	+4.36**	-6.63**	0.000
– Phase I	+11.18**	+3.86**	-7.32**	0.000
– Phase II	+10.92**	+4.57**	-6.35**	0.000
Other	+9.82**	+4.03**	-5.79**	0.000
Difference (PS3 – Other)			-0.84	0.645
Difference (Phase I – Phase II)			-0.96	0.651

Significance levels: ** at 1%; * at 5%.
Number of LGAs: 184; PS3: 93 LGAs (Phase I: 26; Phase II: 67); Other: 91 LGAs.

Figure 21 and Table 22 show the time trends and annualized average change in the percentage of health facilities with the RCH tracer drug package. Until 2015, there was a sharp increase in the percent of facilities with the package for both PS3 and other regions, followed by maintaining some consistency in early 2015. After PS3 started, there was a steep drop in this indicator that reached a minimum level in mid-2016. By the end of 2017, health facilities in both PS3 and other regions had recovered and exceeded 2015 levels. By mid-2018, almost 90 percent of health facilities country-wide had the drug package. The indicators over time for both PS3 and other areas did not significantly differ. Within PS3 areas, there were no differences between trends in Phase 1 and Phase 2 LGAs (Figure B.18, Appendix B).

3.2. Quantitative Evaluation: Evaluation Question 2

This section provides answers to evaluation question 2 and expands the answer for question 3 for financial and human resources:

- Evaluation question 2: In PS3 focus regions, to what extent have financial and human resources indicators changed over time?
- Evaluation question 3: Are there differences in the changes over time observed in certain groups of LGAs, in particular between Phase 1 and Phase 2 LGAs?

Questions 2 and 3 are answered examining the time trends of key financial and human resources indicators in PS3 regions and in the other (non-PS3) regions of the country. The graphs in this section present the trajectory of the annual weighted average of financial and human resources indicators for the LGAs in those two groups. Time series financial data were obtained from the council financial reports prepared by each LGA of the country. Time series human resources data came from different sources as indicated in section 2.1.3 above. We have also included, where applicable, qualitative information gathered on the context and perception of these trends. Additional qualitative results are presented in section 3.3.

3.2.1. Financial Resources Indicators

Figure 22. Personnel emoluments per capita in health

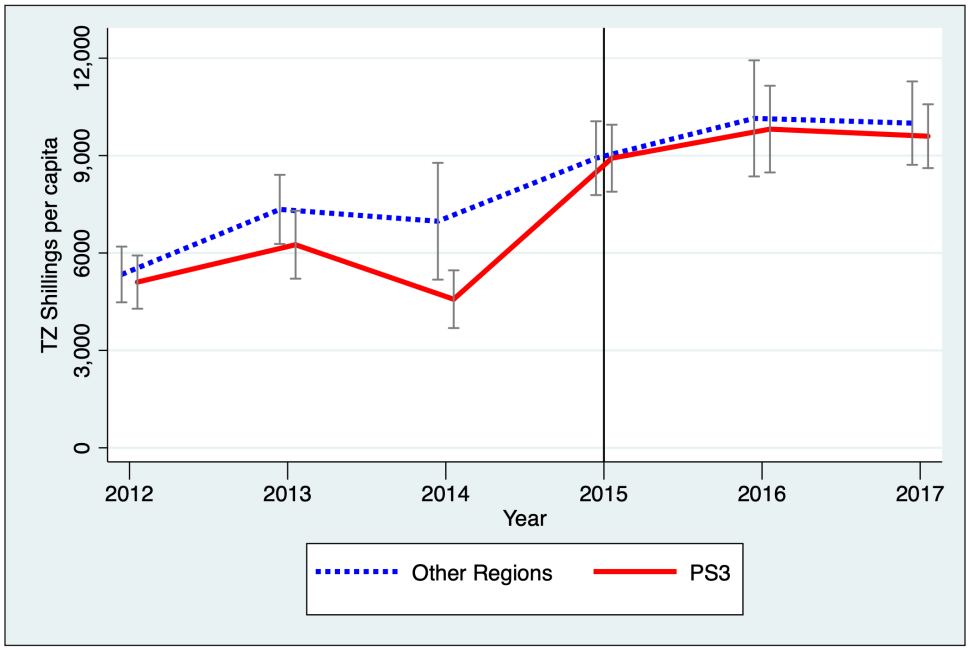


Table 23. Average annual change in personnel emoluments per capita in health, in TZ shillings per person

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2017 (2)	Difference (2)-(1)	P-value of difference
PS3	-316.20	+332.65	+648.85*	0.044
– Phase I	-173.52	-96.58	+76.94	0.889
– Phase II	-342.31	+507.63	+849.93*	0.029
Other	+783.97	+523.61	-260.36	0.629
Difference (PS3 – Other)			+909.21	0.147
Difference (Phase I – Phase II)			-772.99	0.252

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 22 and Table 23 show the time trends and annualized change in annual personnel emoluments (PE) per capita in health. PEs in health are the total gross salary received by all civil servants and service providers working in health services/facilities in the LGA and marked as such in the council financial reports (CFR) prepared by each LGA. The figures used in this report are estimates obtained by adding the PE amounts from four quarterly CFRs reported by the LGAs. Population estimates for each LGA were obtained from population projections published by the National Bureau of Statistics (NBS).

Overall, PS3 and other regions show similar levels and time trends in PE per capita in health. With the exception of fiscal year 2014–15, this indicator increases every year of the observation period. The positive trend was maintained during the time PS3 was active. Prior to 2015, levels of this indicator increased from below TSh 6,000 per capita to around TSh 9,000 for both groups. During this time, there was a sharp decline in 2014, particularly for the PS3 regions, followed by a quick recovery. There was no significant difference in the annual average change in this indicator prior to 2015. After 2015, PS3 and other areas experienced similar levels of PE per capita in health, which increased from 2015–2016, and appear to be steady from 2016–2017. However, in PS3 regions, the difference in the average annual change in this indicator was significant, when comparing the two time points, largely due to significant changes seen in PS3 Phase 2 LGAs. Comparing PS3 and other regions, there was no difference between these areas in the average annual change in PE per capita in health across the two time periods (Figure B.19, Appendix B).

Figure 23. Personnel emoluments per capita in education

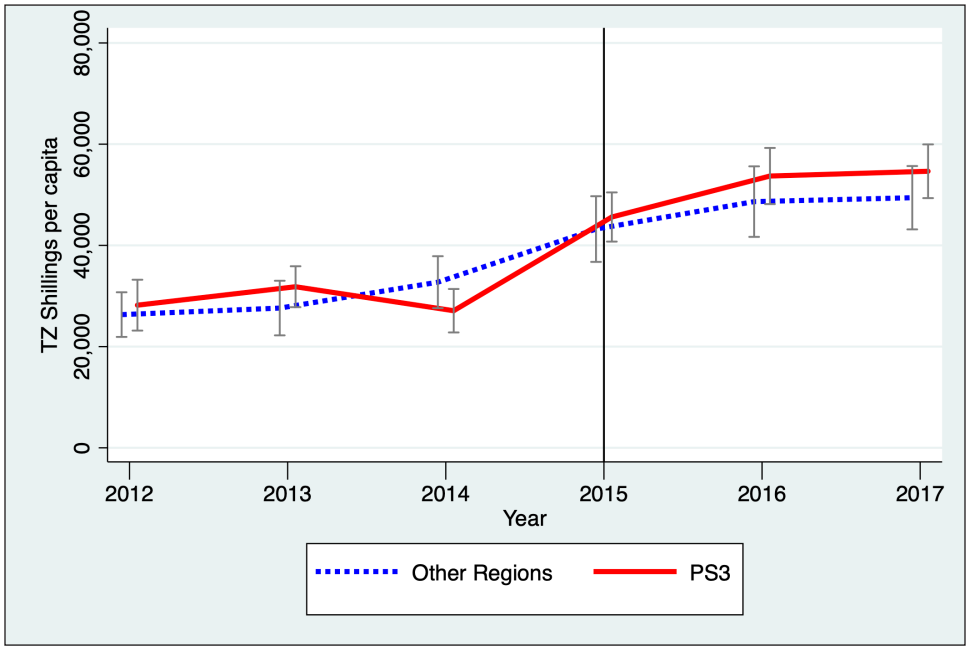


Table 24. Average annual change in personnel emoluments per capita in education, in TZ Shillings per person

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2017 (2)	Difference (2)-(1)	P-value of difference
PS3	-704.69	+4,481.45**	+5,186.14*	0.018
– Phase I	+1,810.96	+3,029.31	+1,218.35	0.787
– Phase II	-1,422.36	+5,078.98	+6,501.34**	0.008
Other	+3,256.14*	+3,043.04*	-213.11	0.902
Difference (PS3 – Other)			+5,399.24	0.054
Difference (Phase I – Phase II)			-5,282.99	0.302

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 23 and Table 24 show the time trends and annualized change in PE per capita in education. From fiscal year 2012–13 to 2014–15, levels of this indicator appeared to stay steady around TSh 30,000 per person, followed by an increase to above TSh 40,000 for both PS3 and other areas. The increases continued past 2015, maintaining steady levels from fiscal years 2016–17 to 2017–18 for both areas, although the average PE per capita for PS3 regions was above that of other areas. During the period of PS3 implementation, there were significant differences seen in the average annual change in PE per capita in education in both PS3 and other areas, but these were not significant when stratifying LGAs in PS3 regions by implementation phase. Comparing PS3 and other regions, there was no difference between these areas in the average annual change in PE per capita in education across the two time periods. Trends and annualized average changes in PE per capita in education were also similar when comparing Phase 1 and Phase 2 LGAs (Figure B.20, Appendix B).

Figure 24. Other charges per capita in health

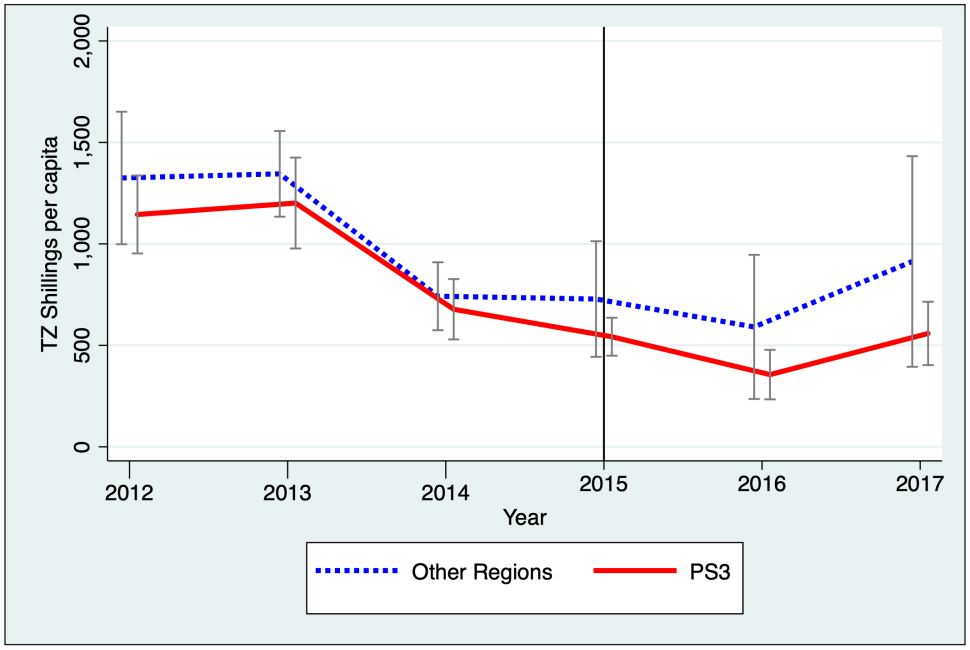


Table 25. Average annual change in other charges per capita in health, in TZ Shillings per person

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2017 (2)	Difference (2)-(1)	P-value of difference
PS3	-244.52**	+9.94	+254.46**	0.000
– Phase I	-393.71**	+19.45	+413.16**	0.004
– Phase II	-187.34**	+5.57	+192.91**	0.009
Other	-300.82**	+96.73	+397.54**	0.000
Difference (PS3 – Other)			-143.08	0.269
Difference (Phase I – Phase II)			+220.25	0.170

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 24 and Table 25 show the time trends and annualized change in other charges (OCs) per capita in health. OCs are other non-payroll charges flowing through either LGA or service provider bank accounts in the health sector of the LGA and marked as such in the CFRs prepared by the LGAs. The figures used in this report are estimated by adding the OC amounts from four quarters reported by each LGA. Population estimates for each LGA were obtained from population projections published by the NBS.

Prior to 2015, there was a drop in the OCs per capita in health from 2013–2014. The decline continued slightly for PS3 regions and remained relatively steady for other areas until 2016. From 2016–2017, there was a slight increase in this indicator for both areas, however PS3 regions had lower levels than other areas. The average annualized change in OCs per capita in health declined significantly before PS3 implementation until 2015. After 2015, there were no significant differences in the average annualized changes for any area. Comparing across the two time periods, the average annualized change was significantly higher for both PS3 and other regions after implementation. However, the differences between the two areas across the two periods were not significantly different. Stratifying PS3 areas by implementation phase reveals similar patterns for both Phase 1 and Phase 2 LGAs (Figure B.21, Appendix B).

Figure 25. Other charges per capita in education

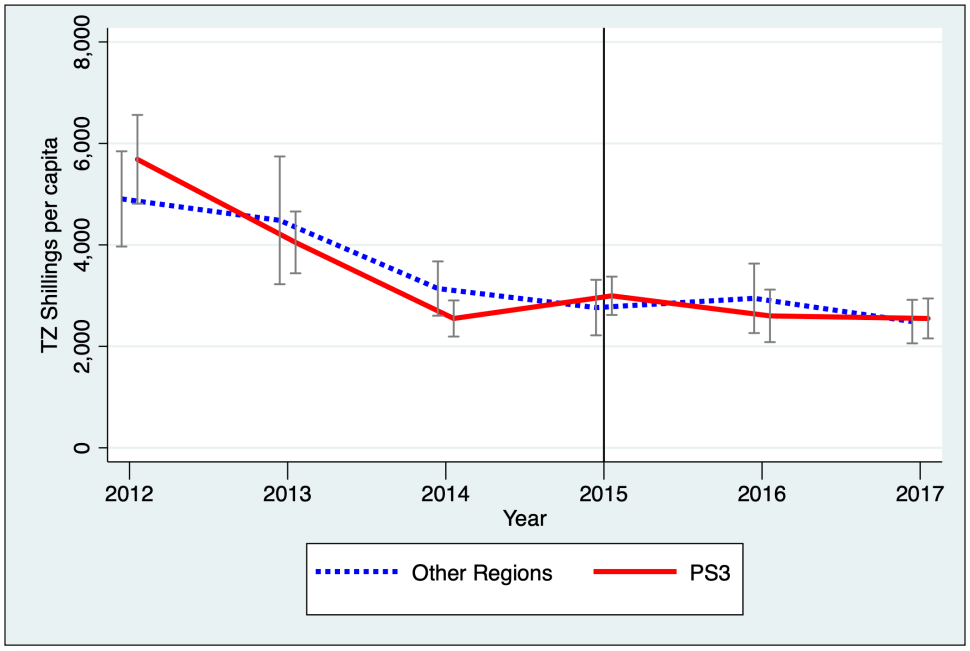


Table 26. Average annual change in other charges per capita in education, in TZ Shillings per person

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2017 (2)	Difference (2)-(1)	P-value of difference
PS3	-1,5575.64**	-221.66	+1,353.98**	0.000
– Phase I	-1,329.78**	-204.27	+1,125.51**	0.000
– Phase II	-1,652.90**	-229.20	+1,423.69**	0.000
Other	-841.01**	-103.80	+737.21**	0.000
Difference (PS3 – Other)			+616.76*	0.043
Difference (Phase I – Phase II)			-298.18	0.481

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=164; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 25 and Table 26 show findings for OCs per capita in education. From 2012–2014, levels of this indicator for both PS3 and other regions declined, and then remained steady from 2014–2015. The average annualized changes in OCs per capita in education show statistically significant declines in all areas. After PS3 was implemented in 2015, there were no significant differences in the average annualized change in any area, including when stratified by implementation phase (Figure B.22, Appendix B). This stable level is seen in Figure 25, which shows little change in the levels of OCs per capita in education from 2015–2017. However, the differences between the two time periods and the two areas was significant. In PS3 areas, the rate of decline lessened by TSh 616.76 more than the rate of decline in other areas.

3.2.2. Human Resources Indicators

Figure 26. Nurses per population

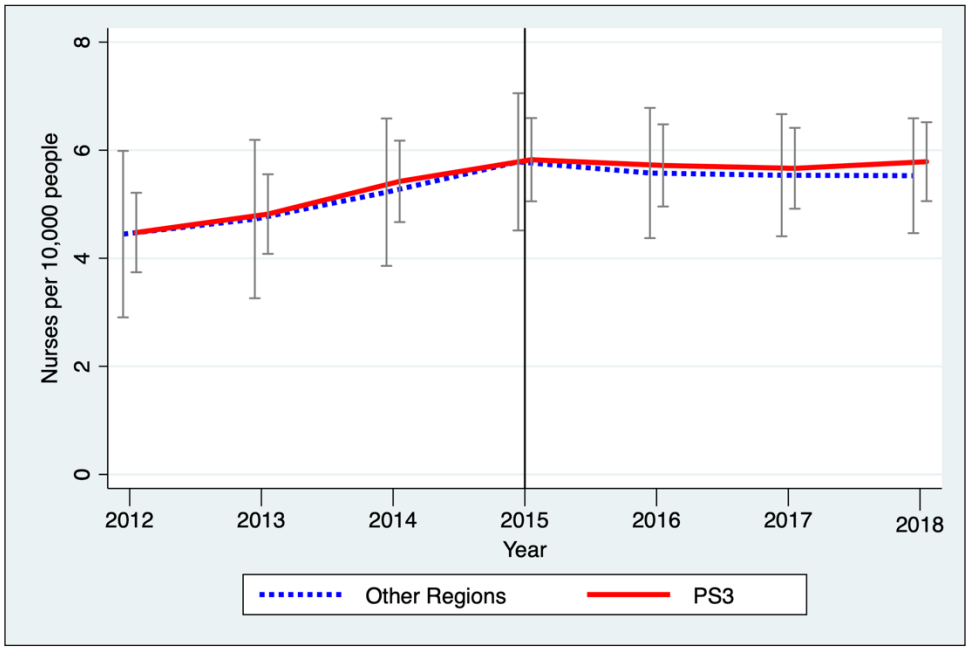


Table 27. Average annual change in the nurses per population ratio (in nurses per 10,000 people)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	+0.46**	+0.035	-0.43**	0.000
– Phase I	+0.47**	+0.10*	-0.36**	0.000
– Phase II	+0.46**	+0.007	-0.46**	0.000
Other	+0.45 **	-0.025	-0.48**	0.000
Difference (PS3 – Other)			+0.05	0.480
Difference (Phase I – Phase II)			+0.09	0.338

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 26 and Table 27 show the time trends and average annual change in the number of nurses per 10,000 people in the population. Prior to 2015, both PS3 and other areas were increasing at a similar average annual rate of 0.45 nurses per 10,000 people. After 2015, these ratios stabilized in both types of region at a level close to six nurses per 10,000 people. Both types of region follow a clear national trend in this indicator with no differences being detected between the regions. Similar patterns in time trends were observed in PS3 Phase 1 and Phase 2 LGAs (Figure B.23, Appendix B).

Community members and key informants in all regions discussed concerns around perceived shortages of health facility staff and the subsequent effects on service quality and health outcomes. This shortage was commonly discussed within the national context of recent certification rules, whereby staff in various sectors were laid off for being unqualified.

> *[One challenge] is the inadequate workers/employees after the issue of certificates verification, so new recruits have been posted and soon are going to report.* [KII with RMO, other]

Figure 27. Doctors per population

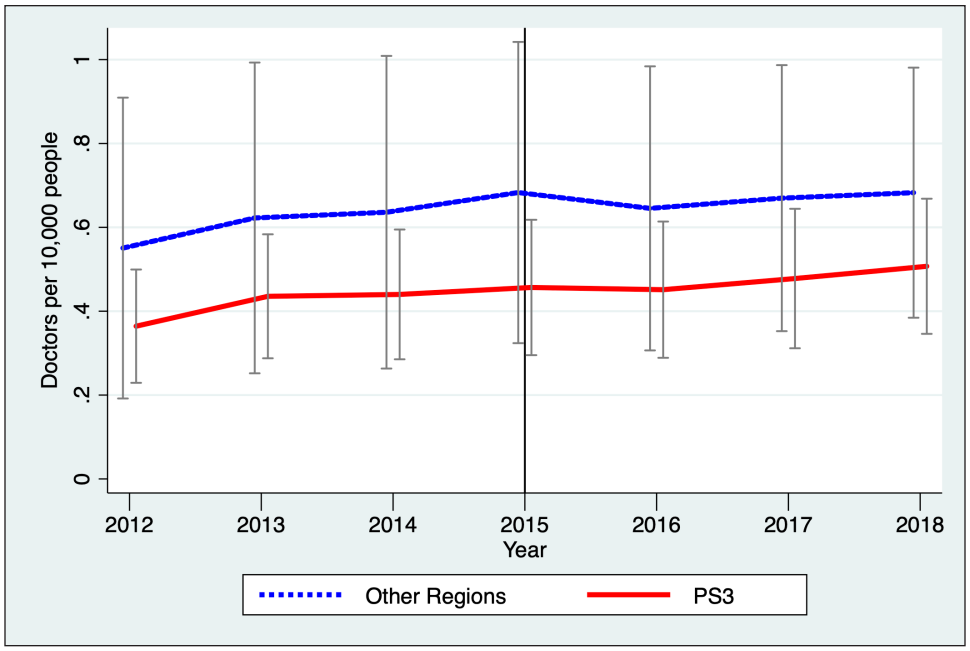


Table 28. Average annual change in the doctors per population ratio (in doctors per 10,000 people)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	+0.028**	+0.028**	0.000	0.984
– Phase I	+0.027**	+0.033**	+0.006	0.476
– Phase II	+0.029**	+0.026**	-0.003	0.783
Other	+0.041**	+0.019	-0.022	0.096
Difference (PS3 – Other)			+0.022	0.147
Difference (Phase I – Phase II)			+0.009	0.496

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 27 and Table 28 show the time trends and average annual change in the number of doctors (MDs) per 10,000 people in the population. Throughout the entire time period, on average, other regions had higher levels of doctors per population ratio than PS3 regions. Both groups of regions have followed similar increasing time trends. Prior to 2015, there was a slight increase of 0.028 and 0.041 doctors per 10,000 people per year in PS3 regions and other regions, respectively. After 2015, the average annual increase for PS3 regions was almost the same and remained significant. Other regions also maintained a small increasing rate. There were no differences between the time trends of PS3 Phase 1 and Phase 2 LGAs. They followed patterns similar to the overall trend (Figure B.24, Appendix B).

Figure 28. Assistant medical officers per 10,000 people

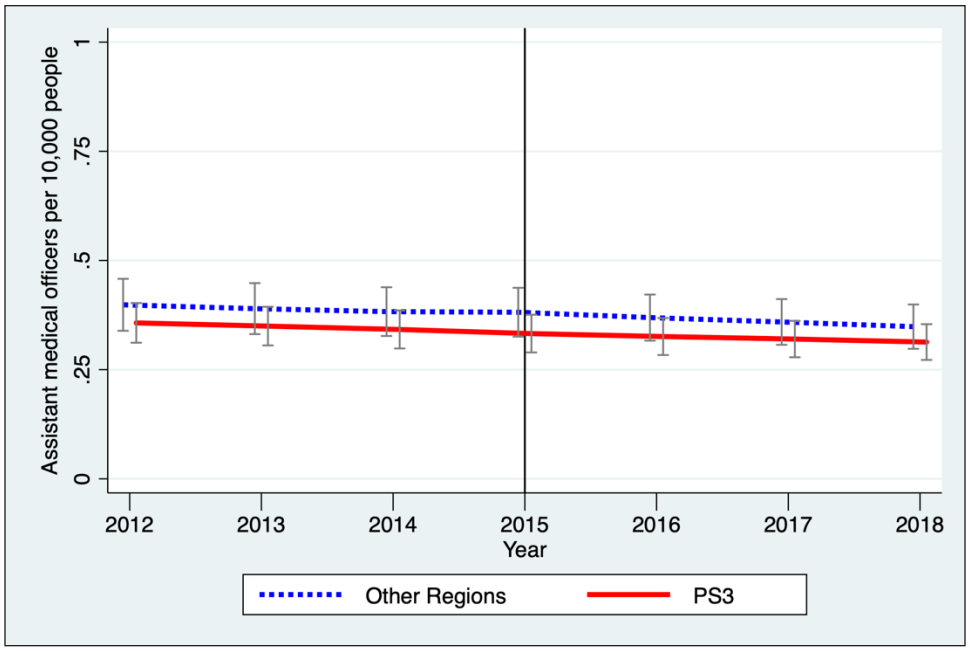


Table 29. Average annual change in assistant medical officers per population ratio (per 10,000 people)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	-0.008**	-0.006**	0.002	0.384
– Phase I	-0.003	-0.003**	-0.0001	0.933
– Phase II	-0.010**	-0.007**	+0.003	0.342
Other	-0.006	-0.010**	-0.005**	0.006
Difference (PS3 – Other)			+0.007*	0.016
Difference (Phase I – Phase II)			-0.003	0.369

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 28 and Table 29 show the time trends and average annual change in the number of assistant medical officers (AMOs) per 10,000 in the population. There was a slight decrease in the number of AMOs per 10,000 in the population throughout 2012–2018 in both areas. The small changes in the rates between PS3 areas and other regions were statistically significant, with the rate decreasing less, by 0.007 AMOs per 10,000 people annually, in PS3 areas. Comparing PS3 phases, Phase 2 LGAs had time trend patterns almost identical to other areas. Phase 1 LGAs had similar trends but at a lower level (Figure B.25, Appendix B).

Figure 29. Health care workers that are female

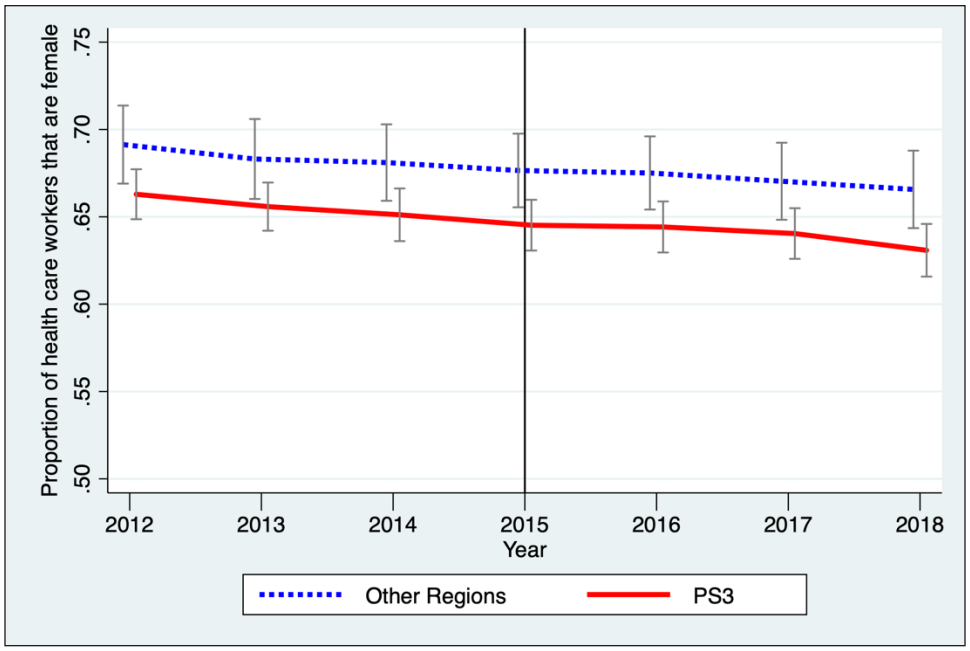


Table 30. Average annual change in the proportion of health care workers that are female (in percentage points)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	-0.58**	-0.67**	-0.09	0.503
– Phase I	-0.43**	-0.81**	-0.38	0.103
– Phase II	-0.64**	-0.61**	-0.03	0.859
Other	-0.46**	-0.47**	-0.01	0.964
Difference (PS3 – Other)			-0.08	0.678
Difference (Phase I – Phase II)			-0.41	0.151

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=166; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Gender indicators were included in this evaluation as gender integration is a component of the PS3 intervention. Figure 29 and Table 30 show time trends and average annual changes in the proportion of health care workers (HCWs) that are female. Across time, there was a slight decline in this indicator, particularly in PS3 areas, which could be interpreted as moving towards gender equity, but the exact reasons are unknown. In 2015, about 65 percent of HCWs were female in PS3 areas, and almost 68 percent were female in other areas. The rate of change did not change after 2015. In terms of implementation phases, patterns for Phase 1 and Phase 2 seem to reflect the overall trends, however, Phase 1 LGAs had generally lower levels of female HCW participation than Phase 2 LGAs (Figure B.26, Appendix B).

Figure 30. Primary school student-teacher ratio

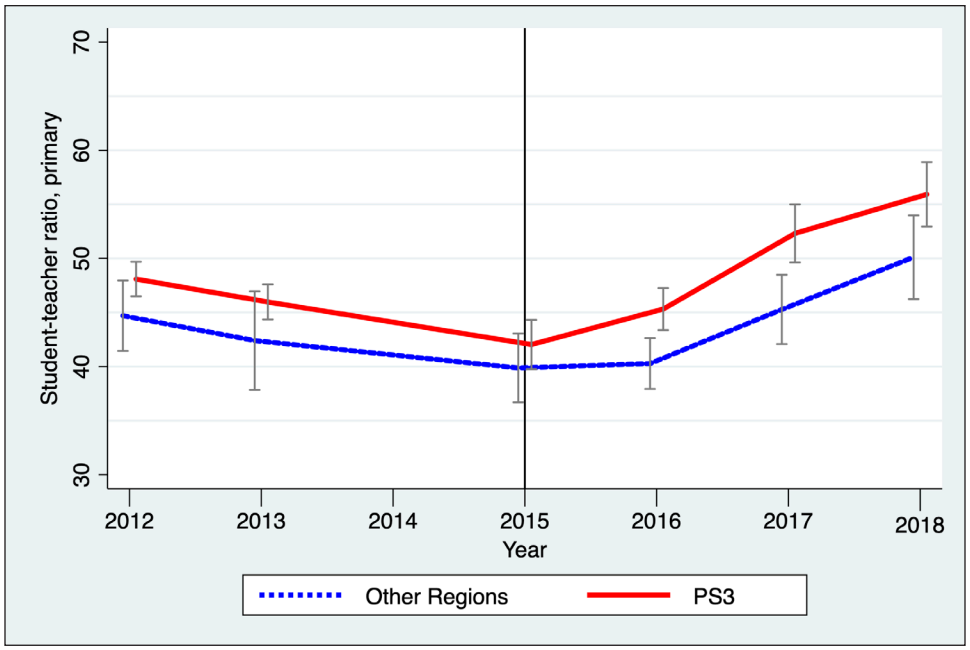


Table 31. Average annual change in the primary school student-teacher ratio (in students per teacher)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	-2.01**	+5.30**	+7.31**	0.000
– Phase I	-1.98*	+6.68**	+8.65**	0.000
– Phase II	-2.04**	+4.76**	+6.80**	0.000
Other	-1.54**	+4.92**	+6.46**	0.000
Difference (PS3 – Other)			+0.85	0.322
Difference (Phase I – Phase II)			+1.85	0.088

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=162; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 30 and Table 31 show the time trends and average annual change in the student-to-teacher ratio for primary schools in PS3 areas and other regions. The trends were similar in both groups of regions. There were similar decreases in the student-teacher ratio prior to 2015, and an overall increase between 2015 and 2018. PS3 regions consistently had higher levels of this indicator than other regions. Prior to 2015, the rate of decline in PS3 areas was by about two students annually, and about 1.5 students per year in other regions. After 2015, the student-teacher ratio increased by about five students per year in PS3 and other areas. There was no significant difference in the change in rate when comparing the two areas. Phase 1 and Phase 2 LGAs followed similar patterns, with Phase 1 LGAs consistently at higher levels of student-teacher ratios than Phase 2 LGAs (Figure B.27, Appendix B).

Figure 31. Secondary school student-teacher ratio

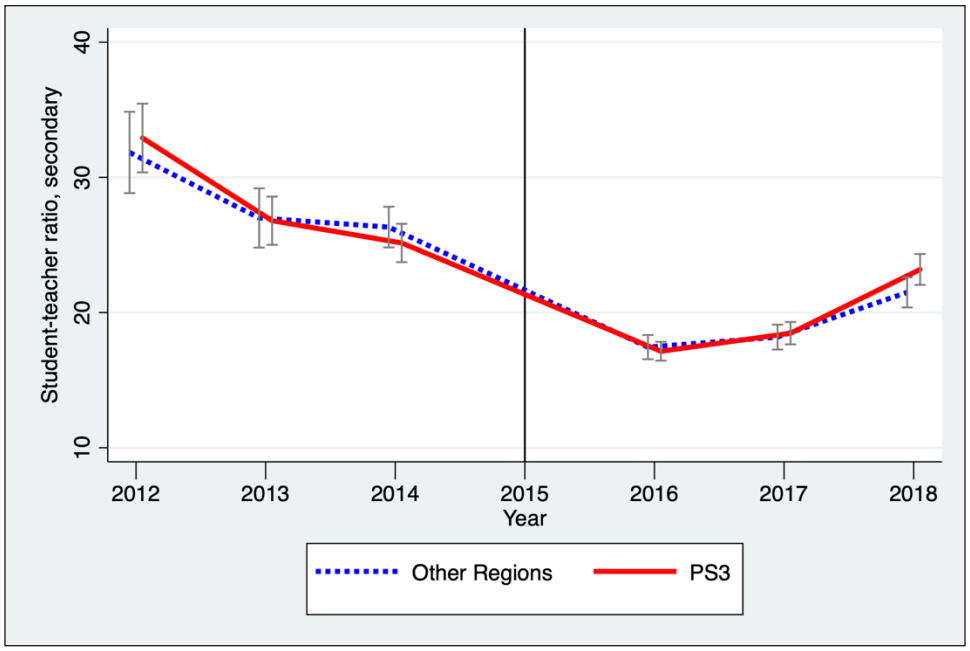


Table 32. Average annual change in the secondary student-teacher ratio (in students per teacher)

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	-3.88**	+3.03**	+6.91**	0.000
– Phase I	-4.51**	+3.34**	+7.85**	0.000
– Phase II	-3.62**	+2.90**	+6.52**	0.000
Other	-2.77**	+2.04**	+4.81**	0.000
Difference (PS3 – Other)			+2.10	0.055
Difference (Phase I – Phase II)			+1.33	0.414

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=164; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 31 and Table 32 show the time trends and average annual changes in the student-to-teacher ratio for secondary schools. The figure shows similar levels and time trends of student-teacher ratios in PS3 and other areas across all time periods. From 2012–2015, there was a steady decline in this indicator. In PS3 areas, the student-to-teacher ratios declined by 3.88 students per year, and by 2.77 students in other regions annually, prior to 2015. After 2015, student-teacher ratios increased similarly, which was not significant at the 5 percent cutoff. The trends for LGAs in both PS3 phases followed similar patterns (Figure B.28, Appendix B).

Qualitative results showed that teacher shortages were seen as a problem locally. This occurred simultaneous to free-education polices that may have resulted in higher enrollment, as discussed qualitatively.

> *I will talk about the issue of education, for the past three years up to now there are a lot of changes. There was laziness especially to the people who are living beside the town, the children they were not going to school and just stay at home looking after livestock. But after the issue was recognized by leaders, now the children are attending school through this system of free education. Now a lot of people get education, for example in my school there a lot of students until the classes aren't enough for all the students.* [FGD with men, Phase 2]

"What I can say is, we managed to encourage parents to enroll their children, but we did not consider the issue of classes. Our school has very few classes. Save, there are 209 pupils in standard three but there are two classes only. We all know that the maximum number of students for each class is 45. In this size, how can pupils understand their teacher?" [FGD with women, other]

The concern with community members was that while education is free, the perception of the quality and performance of these services was affected.

There are so many students, but few teachers. You will find that there are 100 students in a class when the average proposed number is 45 students. There are classes which are packed with up to 170 students. That decreases performance. [FGD with men, other]

Figure 32. Primary school students that are female

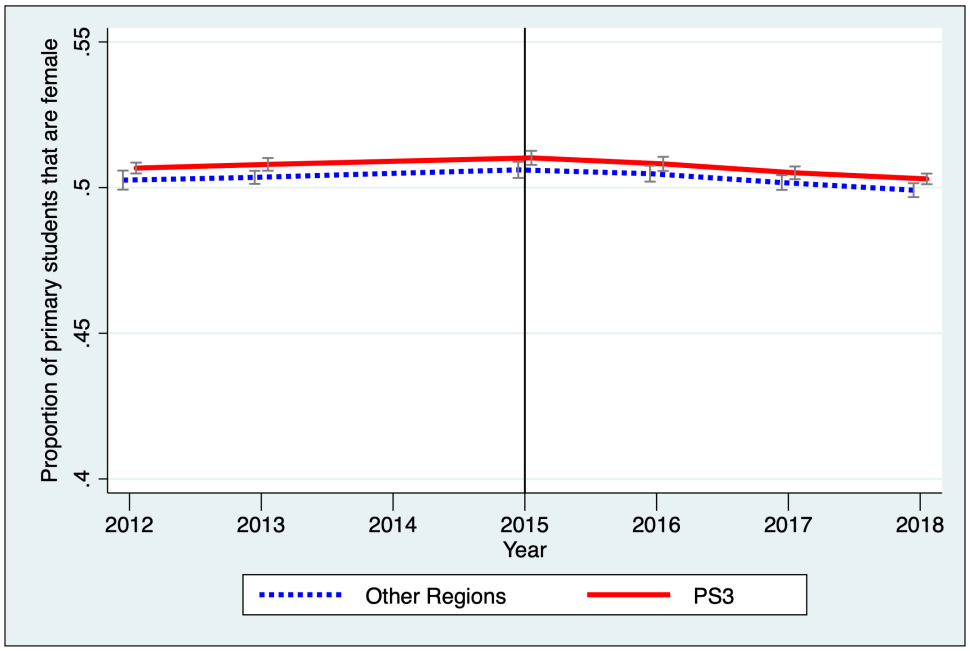


Table 33. Average annual change in the proportion of primary school students that are female, in percentage points.

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	+0.12**	-0.26**	-0.37**	0.000
– Phase I	+0.17**	-0.30**	-0.47**	0.000
– Phase II	+0.10**	-0.24**	-0.34**	0.000
Other	+0.12**	-0.28**	-0.40**	0.000
Difference (PS3 – Other)			+0.03	0.677
Difference (Phase I – Phase II)			-0.12	0.295

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=162; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 32 and Table 33 show the time trends and average annual changes in the proportion of primary students that are female. Across the entire observation time period, both PS3 and other regions show similar levels of female students in primary school, at around 50 percent, which indicates gender parity in primary school participation. PS3 regions show only a slightly higher percentage. There is very little variation in that level over time. Stratifying by PS3 implementation phases, we observe that Phase 1 and Phase 2 follow the same pattern shown in PS3 regions overall (Figure B.29, Appendix B). Estimation of the average annual change in this indicator reveals only small changes and of similar magnitude in both regions.

Figure 33. Secondary school students that are female

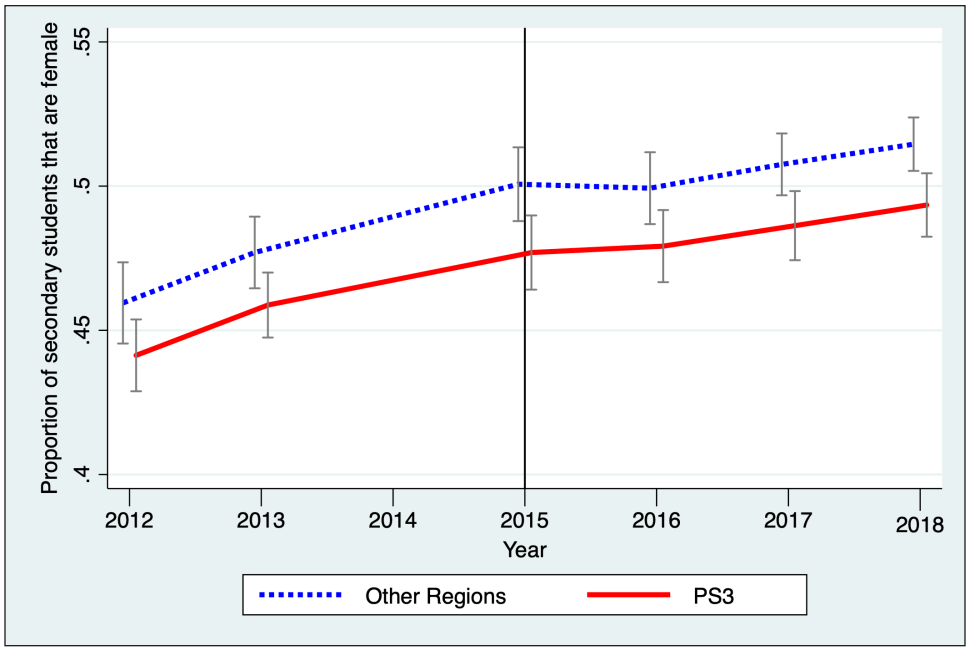


Table 34. Average annual change in proportion of secondary school students that are female, in percentage points

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	+1.16**	+0.71**	-0.44*	0.021
– Phase I	+1.35**	+0.97**	-0.38	0.282
– Phase II	+1.07**	+0.61**	-0.46*	0.046
Other	+1.35**	+0.76**	-0.59**	0.006
Difference (PS3 – Other)			+0.15	0.612
Difference (Phase I – Phase II)			-0.08	0.858

** Significant at < 1%; * significant at <5%
Number of LGAs: Before PS3=165; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

A different situation is found in secondary schools, where there have been important gains in the participation of girls during the period from 2012 to 2018. Figure 33 and Table 34 show significant increases in the proportion of secondary students that are female—from a level of about 44 percent in 2012, to a level around 50 percent by 2018—indicating that parity between genders was achieved. Similar levels and increasing trends are found between the PS3 phases (Figure B.30, Appendix B). Table 34 confirms the similarity of PS3 and other regions in the positive annual change in the indicator.

Figure 34. Primary school teachers that are female

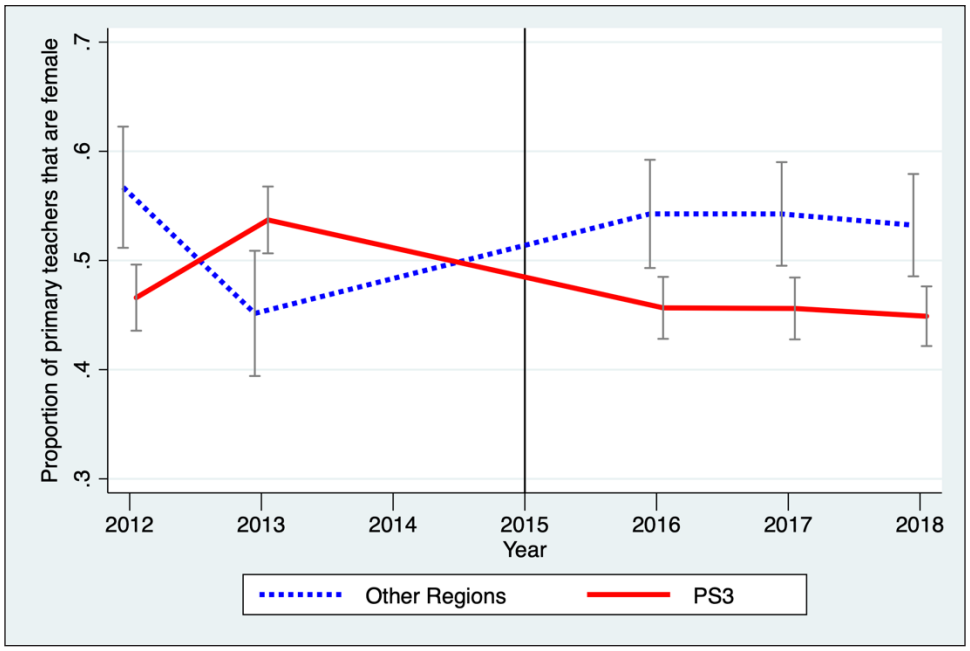


Table 35. Average annual change in proportion of primary school teachers that are female, in percentage points.

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018 (2)	Difference (2)-(1)	P-value of difference
PS3	+7.12*	-0.38**	-7.50*	0.010
– Phase I	+19.95**	-0.30*	-20.26**	0.000
– Phase II	+2.31	-0.41**	-2.72	0.454
Other	-11.56*	-0.52	+11.03*	0.043
Difference (PS3 – Other)			-18.54**	0.003
Difference (Phase I – Phase II)			-17.53**	0.000

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=162; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Given the gender parity achieved among primary school students, it is important to examine the gender composition among teachers. Figure 34 and Table 35 show the time trends and average annual changes in the proportion of primary school teachers that are female. During the entire observation time period, both PS3 and other regions show levels close to gender parity among primary teachers. PS3 regions show levels lower than other regions in most years, with the exception of 2013, but at over 45 percent. Examining the patterns over time by PS3 phases, we observe fluctuations in PS3 Phase 1 LGAs while Phase 2 LGAs remain remarkably stable, at a level of 50 percent (Figure B.31, Appendix B). These two differences—between PS3 and other areas, as well as Phase 1 and Phase 2 LGAs—over the observed periods were both statistically significant.

Figure 35. Secondary school teachers that are female

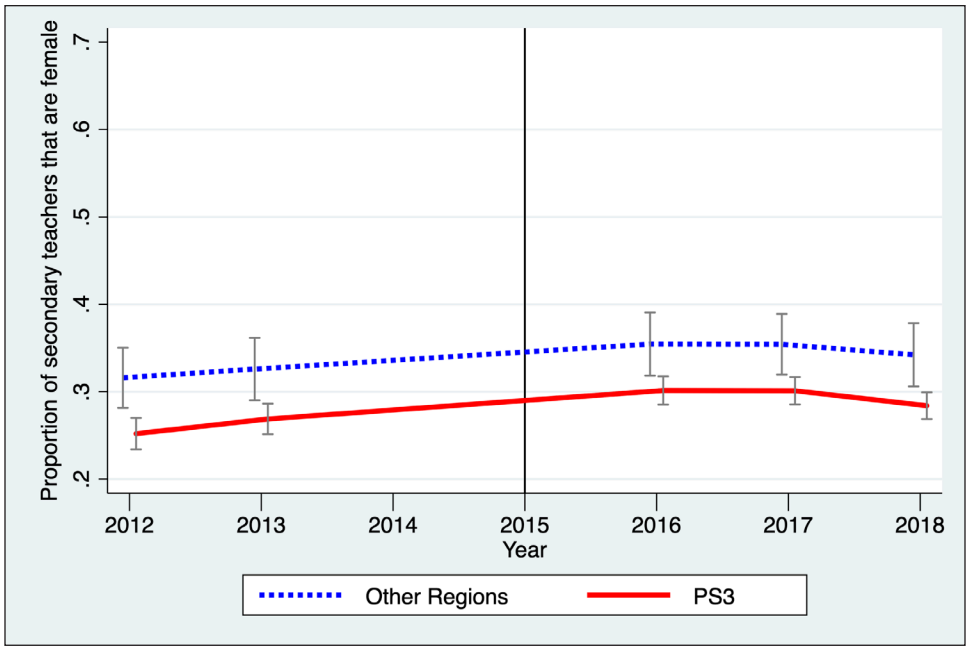


Table 36. Average annual change in proportion of secondary school teachers that are female, in percentage points

LGAs	Before PS3 2012 to 2015 (1)	PS3 active 2016 to 2018(2)	Difference (2)-(1)	P-value of difference
PS3	+1.68**	-0.87**	-2.56**	0.000
– Phase I	+1.53	-0.74**	-2.27**	0.005
– Phase II	+1.75**	-0.92**	-2.67**	0.000
Other	+1.00*	-0.62**	-1.61**	0.000
Difference (PS3 – Other)			-0.94	0.072
Difference (Phase I – Phase II)			+0.40	0.654

Significance levels: ** at 1%; * at 5%.
Number of LGAs: Before PS3=165; PS3 active=184, 93 LGAs (Phase I: 25; Phase II: 68), Other: 91 LGAs.

Figure 35 and Table 36 show the time trends and average annual changes in the proportion of secondary school teachers that are female. There is a clear gender disparity in the composition of secondary teachers. In PS3 regions, there were increases in levels of secondary school teachers that are female, from a level of 25 percent in 2012 to 30 percent in 2016 and 2017, but levels declined in 2018. Consistently higher levels of female participation, of at least five percentage points on average, were observed in other regions. PS3 Phase 1 LGAs show lower female participation among secondary teachers than Phase 2 across all years of the observation period. Both areas show similar time trends (Figure B.32, Appendix B).

3.3. Qualitative Results

Additional qualitative results are presented here in terms of the three relevant evaluation questions, and they were in line with the main components of the PS3 program, namely: governance and civic engagement, finance, human resources, and information systems. We found very few discernible differences between zones (Eastern Lake versus Central and East Southern Highlands) and no differences between old and new LGAs. We present differences between PS3 regions (Phases 1 and 2) and other regions as applicable.

3.3.1. Evaluation Question 4

These subsections provide the qualitative findings for evaluation question 4: How do stakeholders perceive the performance and influence of PS3 on health services, financial and human resource systems, and community engagement and governance?

In general, and across PS3 and other regions, stakeholders perceived improvements in governance and civic engagement, finance, and human resources, as well as the information systems that support these components.

3.3.1.1. Community Engagement and Governance

Community members in PS3 areas and other regions discussed perceived improvements in their ability to communicate with local leaders. This was in part through a greater understanding and expansion of communication channels. Procedures for communication were made clear especially through public meetings, notice boards, and in some occasions through suggestion boxes and complaint registers established at service facilities. Conversely, LGA websites, such as those established by PS3, were not known or commonly used by community members. Physical presence and engagement of community leaders with citizens was also perceived to have improved, in both control and intervention areas.

> *…it is true that even our leaders today have come back to the rural areas. I've worked 13 years in the district, over five years ago I had never found a director coming up to people or district officials coming...I had never seen, but in this case I've seen two, three, or four district leaders coming and talking to the elders and talking to the people, so the participation has become closer, the leadership has left chairs and are now moving around to the people.*
> [FGD with male community members, other]

Local leaders and LGA councilors also reflected this sentiment, describing a reduction in the gap between government and citizens. In intervention areas, LGA councilors credited the improvement to the trainings they received from PS3.

> *Our behavior has made citizens voice out their opinions, before the training we used to dictate, and citizens were afraid and uncomfortable around us we had no cooperation. But after the training citizens see us as a part of their community.* [REM with LGA councilors, Phase 1]

This improved engagement between community members and local government has increased understanding in the value of engaging with the government for development.

> *…in the past calling citizens for meetings was a big issue, most of them didn't see the reason to come and the few who came were either drunk or disinterested, but due to PS3 the citizens have seen the value of collaborating with their leaders to move the development agenda…* [FGD with male community members, Phase 2]

This was also reflected by LGA councilors, who felt greater participation from community members both was a cause and consequence of development projects, such as construction of infrastructure (schools and health facilities) and stocking of those facilities (e.g., with desks).

> *Good relations have helped to be in a good position to combat different challenges. For example, there was a time period when there was a shortage of desks at schools. I called a meeting that involved different levels of people in terms of their occupations or professions. We had businessmen, farmers, animal keepers, etc. We received 20 desks courtesy of their contributions. We have been through thick and thin in health and education, but we have always managed to pull through difficult obstacles like that thanks to that kind of collective efforts.*
> [REM with LGA councilors, Phase 1 – Bahi]

One community member even discussed engaging with local government to specifically address issues in maternal and child health.

> *Frankly speaking, I was convinced to engage with the local government in order to have chance to visit women and under-five years children to sensitize them. As I have said earlier, during the past years they were not attend the RCH services of which I then decided to engage with the local government in to help my fellow women who have children, pregnant women in order to address that challenge to reach success at the end.*
> [FGD with female community members, other]

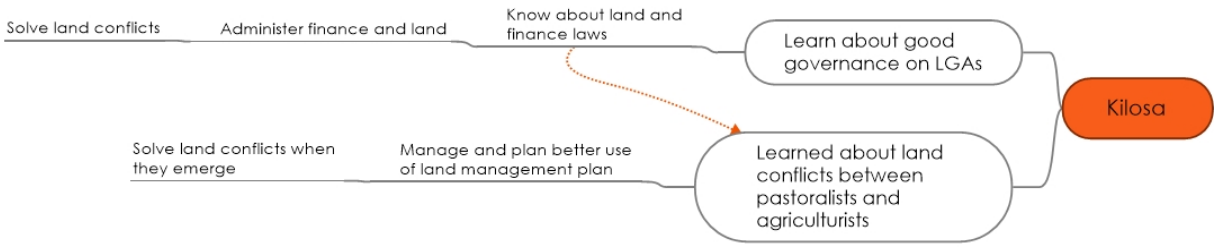
In addition to development projects in communities, stakeholders perceived that increased citizen engagement in both control and intervention areas has improved transparency in designing, budgeting, and implementing projects.

> *In these last three years, citizens participate in decision making and they have power to criticize their government. Nowadays, people can present their complaints and make follow-up on whatever matters approved by the government. Take an example, if we donate some money for construction purposes, citizens can now monitor the expenditure and progress of the program. Decisions are made from the lowest level to the highest level…* [FGD with female community members, other]

Overall, citizens expressed more comfort in voicing their opinions and holding their local leaders accountable. Councilors, in both control and intervention areas, expressed some level of knowledge and awareness of community members' complaints. However, REM and KIIs with LGA councilors found higher levels of knowledge on governance issues in terms of how they were prepared to respond to these complaints and issues. One illustrative difference is in understanding land and finance laws and responding to conflicts.

When discussing effects of PS3 trainings on LGA councilors, one REM group discussed how trainings improved their governance by learning about land and finance laws. The trainings also enabled them to engage with citizens through appropriate channels to better understand conflicts between pastoralists and agriculturalists. These two components allowed the councilors to manage and plan for better use of their land management plan and solve land conflicts when they emerge (Figure 36).

Figure 36. Excerpt from REM Map with LGA councilors, Phase 2 – Kilosa



When asked about controlling land issues in a non-PS3 area LGA, one councilor remarked that, to his knowledge, there is not a control system on land service and proper supervision is needed. Additionally, there seemed to be a gap between the bureaucracy and citizen expectations.

> *The foremost challenge is that citizens are not educated on issues like compensation, land survey and its costs are unbearable.* [KII, LGA councilor, other]

When asked what a "new program for assisting in public systems control could do" to support the councilors, he responded:

> *First is transparency, second is to inform on what is going to be done, and through the two issues citizens may be convinced to accept the system. Another is to create the friendly environment for the citizens to accept the systems. Citizens should be informed about the ongoing issues and understand 1...2...3, should be informed about the sources of funds and its spending, they will increase their support in any case their money is used.* [KII, LGA councilor, other]

The new program described above reflects many of the positive attributes of the PS3 trainings detailed in interviews and group discussions with stakeholders. Intervention area councilors detailed greater capacity to engage citizens in addressing land issues as part of their roles and responsibilities.

> *We learned about our responsibilities as councilors and how to administer people at the ward level, something that we were not aware of in the past. This has helped reduce conflicts and confrontations during meetings. [REM, Phase 1]*

While Bahi received greater support in addressing citizen complaints, we found no discernible difference in perceptions of performance among intervention areas.

As part of their roles and responsibilities, LGA councilors act as a bridge between citizens and various levels of officials, ranging from civil servants to government officials, such as the District Executive Director (DED), and coordinate with other wards. Across all areas, councilors' relations with other leaders seemed to be improving. Councilors who were engaged through the REM method commented that they were improving in their performance, especially in the understanding of their responsibilities and administrative hierarchies.

> *Cooperation between councilors and civil servants at the district council is vital. We were told that District council is under councilors so a bad relationship with servants will limit development, after the training we have established good relationship and we now rectify mistakes by following principles." [REM with LGA councilors, Phase 2]*

> *"PS3 training has helped to harmonize the relationship between us councilors and DED; before the two were like enemies. The training helped councilors know their administrative limits towards the DED…now we know there is a hierarchical procedure to follow.* [REM with LGA councilors, Phase 2]

Perceptions of LGA public service systems and management performance were reported as positive in comparison to the past. Across both PS3 and other areas, key informants and councilors described LGA management systems as having improved various responsibilities, including managing council funds both at council and lower levels. Community members shared similar thoughts, reporting satisfaction with how their leaders have been managing the funds compared to the past and how they have been responding to the complaints. This was presented in terms of satisfaction with the transparency and services provided. For example, one community member expressed:

> *In health facilities, let's say the dispensary we know the fund that has been brought and how it is used, because the financial reports are normally shared during the village assembly meetings and also when there is weakness in the services provided we know the channel to follow in reporting…this way the services have improved to a greater extent...* [FGD with female community members, other]

LGA councilors and other GOT stakeholders echoed this sentiment, noting systems have improved efficiencies, accountability, and performance through managing council funds, reporting progress and challenges happening at lower levels, and improved accessibility and availability.

> *...thanks to these systems, citizens now can be served on time compared to the previous time. If someone needs a driving license, provided that their information is already fed on the system, they will get them within a very short time. The service is available all the time and uses very short time to serve many people...as I have just said, it simplifies the provision of services to the public.* [KII with ICT officer, Phase 2]

Governance and community engagement were overwhelmingly discussed as improved across all areas. It was also noted as the most significant change among LGA councilors in most REM sessions.

3.3.1.2. Finance

Both PS3 and other areas discussed perceived improvements in financial management and accountability in the use of available funds, even when limited. For example, GOT systems, such as Epicor and FFARS, were positively perceived in both PS3 and other areas.

> *FFARS simplifies a lot because there it simplifies to see how money utilization goes, also simply it helps to see what is remaining because when you send you see directly how the expenditure goes compared to your activities and that money is used according to the budget that you planned. For example, maybe in a budget you planned to buy medicines worth 3 or 4 million, so when you deduct it from your system it shows directly that this fund has done this work directly through this activity. So, it is simple to see the fund has done what activity.* [KII with district medical officer, other]

> *Before we were introduced with Epicor we had difficulties in supervising funds, we used local systems to track down the expenditures using guidelines. We used log books and I used to prepare Excel with my own techniques in knowing how the money was used. Epicor shows your sections and inform you on how to use your budget and so if there is any error I check with my accountants and people of TAMISEMI. But secondly, Epicor helps you limit your expenditure and show you your quarterly budget or yearly budget on how to use your money, how much they need to spend and how much money has remained quarterly. And second we used to write minutes to get a check, but with Epicor*

its easier because everything has been generated, from voucher to check is being processed online. So, it has helped manage the money because the money has to be sent for several issues such as Basket fund, medicines and help you plan. So, if the money is from Global Fund it makes you aware of its usage even if it's on the same account. [KII with town medical officer, Phase 2]

Appreciation for and usefulness of these systems was also reflected at the national level, as exemplified through this comment from a local government officer—TAMISEMI:

The positive change in the controls of the services I am currently experiencing is the use of electronic systems in revenue and expenditure issues. For example, Epicor has really proved to be much more important because they were just lost but now one can stay on the computer. I know how some councils have incorporated it and how much it has been…used. The control of finance has become bigger and the revenue collection has increased. [KII with local government officer, TAMISEMI]

Stakeholders in both PS3 and other areas described training on these systems—either by GOT or PS3. In program areas, PS3's continued support was appreciated for addressing challenges as they occurred.

PS3, in my work place [for] the training of FFARS they supported us, when we face some challenges, we call them for an assistance…they help us on time when there is a challenge in a system. They make sure the problem on [the] system solved on time, they will not leave as it is. [KII with district treasurer, Phase 2]

The collective perception from stakeholders was that finance systems put in place have significantly contributed to resource savings. There has been improvement in utilization of the available funds as the responsible officer can now track or follow-up where unnecessary costs occur. This has allowed areas to improve efficiencies in fund use. For example, one KII mentioned they no longer need to travel to Dodoma to submit data, as they now can do so through electronic systems; this allowed more funds to be available for development activities.

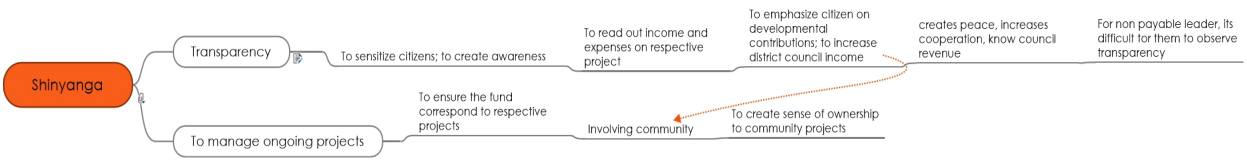
You don't need to travel to Dodoma [for] which we used to spend a lot of money. Of course, last week they designed MESO version where you can use electronic file data where you print a book and send it to Dodoma...we spent a lot of billions, for example last year we spent almost five billion just going to Dodoma for five days but now we are working in our areas... [KII with town medical officer, Phase 2]

Additionally, as discussed in the previous section, stakeholders perceived that financial systems had improved accountability and transparency. LGA councilors in intervention areas noted that transparency and accountability had improved by engaging citizens.

Now that all citizens are involved, there are committees that ensure that the funds allocated by the government are well spent for the intended goals. Not all teachers are involved in committee meeting, except very few such as the head teacher and the finance teacher. There is a system whereby no teacher is allowed to take cash and go to buy school needs at a stationery or shop. All this is done to ensure that no teacher misuses the public fund. [FGD with men, Phase 2]

Through community meetings, councilors read out income and expense reports on respective projects and noted deficits. This allowed councilors to emphasize citizen responsibility for developmental contributions to increase community ownership and even bring about additional sources of revenue to mutually manage ongoing projects (Figure 37).

Figure 37. Excerpt from REM map with LGA councilors, Phase 1 – Shinyanga



3.3.1.3. Human Resources

Both PS3 and other areas described HR distribution and allocation as a challenge. HR systems created to better address these challenges, such as WISN plus POA (or WISNPOA, colloquially), have been rolled-out nationally, but attitudes towards the utility of these systems to solve problems differed slightly between control and intervention areas. For example, one KI in a non-PS3 area described "going around" the system to manage the HR distribution.

> *…the challenge happens during arranging workers according to WISNPOA results, it happens that, in one health center there is one staff and he or she is overloaded to the extent that he or she is no longer remembering to enter some information into the system. And when it comes to analyzing the needs, his or her needs is not seen because it seems like he saved few patients. I suggest that, the ministry has to increase the number of staff without looking at the WISNPOA system.* [KII with DMO, other]

In intervention areas, stakeholders were more positive in their reflection on the systems, indicating the system works well—even when there are challenges related to availability of enough staff; the system makes it easy to identify how the distribution fares in relation to facility needs.

> *There has been a lot of challenges in allocating the employees to facilities. I have to be honest, there have been a lot of challenges on that for a certain employee should go there and the other should go here. But with the use of this system, will be able to keenly determine where there is strongly workload or where there is a need to be allocated employees. Example, if a certain facility highly needs two clinical officers (COs) then this system will identify that two COs are strongly required at certain facility after we have entered the data in the system. And if there is a workload, for instance in the side of nurses, the system will enable to identify that certain number of nurses are needed at a certain facility. Therefore, this system will highly help in allocating the human resources to facilities...* [KII with DHRO, Phase 1]

This positive perception was also present at the national level, whereby system use had made recruiting, allocating, and distributing staff easier.

> *...in the past yes, but now we are doing good work with data, there is availability of right data to help decision making. For example, if a council is allocated ten teachers primary school, let say ten new teachers, the DO will have enough data now to look at where to post those teachers, because he has the number of teachers in his schools, he has the number of teachers who are in studies, he has the number of teachers who are on sick leaves so he will be able to know which school require teachers from those ten, he will be able to make a decision an better allocation...* [KII with PfM advisor – education]

While allocation and distribution of HR seemed to work well with the help of systems, findings across areas, regardless of geographical location, showed that there was an HR availability deficit. The number of workers was perceived to not correspond well with the capacity needed at the facilities, especially in the health sector. The system improvement made it easy to follow up on how staff were working and compensated. Systems like the Open Performance Review and Appraisal System (OPRAS) and LAWSON significantly contributed to make staff at LGAs more accountable and improved efficiencies in sector performance.

> *[LAWSON] is a national system dealing with all employees' information of which it helps us to perform different activities like employment issues. Example, you have seen the newly 14 allocated health sector employees in our council who have come to report. Therefore, their information after they have filled the employees' forms are entered in the LAWSON system for them to approve in order to get the check number and to be determined that they are now the civil servants…it also enables us for promotions and preparation of budgets with this system. When we are doing employees' promotions after they have filled their promotions letters, we enter them in LAWSON, then they are approved of which their salaries change. Therefore, it is a very useful system compared to past years. This system helps us to perform our responsibilities.* [KII with DHRO, Phase 1]

In addition to accountability, some stakeholders expressed that the easy monitoring and follow-up of progress for each individual worker has encouraged changes in the way services are provided. However, others felt the systems are only able to contribute so much in a context where there is a staffing shortage, particularly in terms of skilled staff. Shortages have led to other workers completing tasks outside their position or ability. These resource constraints are reflected in quality of services, as citizens perceive public sector services to be of low quality with high wait times and frequent stockouts and may choose to avoid them altogether.

Largely, we are obtaining health services from the private facilities because the health services at public facilities is of the low quality. Sometimes, you find no medicine or sometimes you are to wait for the medical staff from eight am until twelve noon who are at the meetings and have not yet come to attend the patients. Therefore, we do not know does whether the facility management fail to arrange its schedules for things to work well that people to continue being served or not. So mostly many people or my community opt to obtain the health services from the private hospital rather than public hospitals. [FGD with women, other]

HR capacity, skills, and competencies were expressed more confidently in intervention areas compared to those in control areas. Staff in these areas recognized contribution by PS3/GOT.

…it has strengthened strongly the services delivery, because even if you look the way we welcome the newly allocated public servants they are motivated to perform their jobs. But again, PS3 through trainings has strengthened the way we arrange our receptions. These trainings have enabled even the people working at receptions to work according to regulations; they are receiving incoming mails, outgoing mails in time to the right authorities and implementing them in time. When a customer comes, he/she is cared friendly and receives service he/she requires very smoothly. Therefore, it brings encouragement to our citizens in services delivery. As HROs, we have many customers who are local citizens and our public servants. All these are our customers as an institution… [KII with DHRO, Phase 1]

Similar demonstrations in control areas were contributed by staff who moved to these areas from intervention districts.

3.3.1.4. Information Systems

Positive performance of information systems was highly tied to other areas previously discussed (e.g., HR, finance, governance). For example, respondents noted that HR systems have improved staff allocation, even during shortages, to ensure efficiencies. Information systems have improved financial management and budgeting, particularly at facility levels—for example, FFARS system use has facilitated checks and balances within facilities.

In general, there was a positive perception that the use of systems has reduced the bulk of tasks to be handled manually. Where applicable, IT systems saved time and resources by reducing the use of paperwork. Additionally, former paper-based systems were described as burdensome while also leaving room for error and loss of information. The new digital systems have eased those feelings.

Changes are there, I mean that the presence of the different systems, we previous had "paper-based." Thus, the presence of systems makes a lot of support that even if you want the information that you have already inserted, even if it was years back it is easy to get into the system, you search and find it. Unlike if it was "paper-based" things are easy to disappear or lost quickly… [KII with ICT officer, Phase 1]

These improved efficiencies and data availability have opened space for improvements and development in the community and at council levels. These system changes have also contributed to perceived improvements in data quality and program performance.

…honestly the system has helped me and my fellow physicians to access information easily, supervise on provision of health services in my area, track progress each month, and also compare progress on months before. You can also check on facilities and their performances, how many patients they treated, why they have attended to few patients. You can see the number of patients in OPD and its challenges, you can notice if health centers are providing fake information. So, when supervising you can make follow-ups and solve few problems. They even show trends of patients at certain health centers, why they have so many patients, or why they have few patients, how are vaccines provided, and if things are going smoothly because we also have targets—local targets, regional targets, and national targets—and you as the head, you have to supervise and make sure work performance and provision of services go along the targets and make sure they are archived... [KII with town medical officer, Phase 2]

Additionally, information systems have changed the sharing and communication atmosphere. Stakeholders viewed the systems with which they work as one-stop centers for information. Though not interoperable in many areas yet, the computer-stored information was considered easy to access. Digital systems allow users to access information from anywhere, again reducing the amount of resources spent traveling, as well as expanding the reach of information-sharing.

As you know we are currently more digital that sometimes notice boards are less useful. Example, if someone is somewhere far say in Dar es Salaam or Arusha may not be able to access our information through notice boards. The notice boards are maybe used by the local people but for those who are far it is only the website that can help them to access our council's information. [KII with DHRO, Phase 1]

Training and guidance were provided for government workers at the council level; by GOT in non-PS3 areas and PS3/GOT in intervention areas. These trainings were noted as helpful in building initial capacity among those trained. Specifically, in intervention areas, sustained and ongoing support was also highly valued.

There are improvements in work performance even to the council or district level and primary level there is improvement in the health centers and dispensaries. When you look at the GOT/PS3 sponsored trainings, they have highly capacitated our human resources to improve their job performances…generally, there has been a frequently big technical assistance from the GoT/PS3 expertise. Especially when there are challenges within the systems, the PS3 have been getting together with our IT expertise to address the challenges. Also, during installation of these systems they have been collaborating with our expertise. [KII with DED, Phase 2]

Many respondents discussed the approach of training specific individuals who were expected to go back and train others or provide ongoing support to others. While those that were trained directly spoke positively of the systems, many viewed the approach as flawed. There is a suggestion that more training opportunities are needed in order to completely change the perception and trust of some workers.

…there is this saying that "no research, no right to speak." For us, the system itself is a research. We use it to get report of revenue collected at a given time. It happens that some leaders reject the report believing that it's incorrect. This is due to ignorance since they do not know how the system works. They still rely on written reports which have many shortcomings. For instance, people may forget to write some data, so they tend to estimate the value. The system is the only effective method to be used today. Conclusively, we need more training for these kinds of people…
[KII with ICT officer, Phase 2]

3.3.2. Evaluation Question 5

These subsections provide the qualitative findings for evaluation question 5: In PS3 focus regions, what was the context of any observed or perceived change?

3.3.2.1. Community Engagement and Governance

Positive perceptions and gains in community engagement and governance must be viewed within the context of existing and ongoing initiatives from the GOT. For example, the Opportunities and Obstacles to Development (O&OD) is an intensive participatory process used in both rural and urban areas as a bottom-up planning approach. This process has, for the most part, catalyzed engagement between citizens and local government.

However, a commonly noted issue in creating development plans at the local level was the availability of finances and human resources to carry out these plans.

There is a challenge of not reaching every priority set by the council since there is lack of funds. For instance, you plan to build 10 schools, but you have received funds from the central government enough for three schools only. In every aspect there is challenge, but we have some step ahead every year. We are moving forward. [KII with DED, Phase 1]

Additionally, councilors perceived their allowances to be low in comparison to their workloads and obligations.

3.3.2.2. Finance

Budgetary deficits and, consequentially, the lack of fulfillment of planned activities were commonly reported challenges. At the council level, there were claims that the planned budget was not always met and sweeping national policies were difficult to carry out. Also, respondents noted there was improvements in the financing of health services and provision of funds for free education; however, ministry funds had been delayed in some areas, causing burdens on councils to achieve this requirement. These were seen in terms of equipment shortages and insufficient infrastructure at the service level, both for schools and health facilities.

…challenges exist in different levels of our departments, for example in secondary schools we have challenges of infrastructures, finances, and lack of enough teachers. But in our department the main challenge is finances, because we have to supervise all the activities and deliver…we have poor performance, which in actual sense is poor utilization of resources. In our municipal, we need funds to conduct effective monitoring and without funds we are working in a tough environment… [KII with education officer, other]

…the other challenge is budget deficit, knowing that our department is the mother department its activities cut across all other departments. Therefore, sometimes there are activities which we are responsible to fulfill but we fail due to budget deficit… [KII with DHRO, Phase 1]

Respondents noted that there is increasing demand from a growing population that is not adequately planned for in health and education funding.

…for us a challenge is that our district have expanded and the number of people is many and we are serving near districts around us, so the problem comes in budget. You may find we have planned maybe the budget of three months, but later on it is not enough due to the number of people to be many that comes from within and outside our district, so sometimes you find that medicines are not enough. So, that is a challenge we are facing…
[KII with DMO, central]

Interviews with national-level officials confirmed that budgetary constraints catering to the needs of an increasing population were a challenge for LGAs that can be reflected at the service level. Stakeholders discussed gaps in resources due to financing, such as desks and books at schools, and medicine stockouts at public health facilities.

These are also met by structural and contextual changes in how health financing at the individual-level works, including insurance schemes. Whereby, insurance may cover some testing and/or drugs (and therefore make it more available and increase access/use), but not all.

I: You mentioned increases of tests here, which are they increased?

R1: HIV/AIDS tests is available now.

I: Which challenges that makes increases of various tests and medicine?

R1: The main challenges that come is when you need services by your insurance, they will give only few and important medicines instead of all.

I: Important medicines like what?

R1: They will give you some and other you are told to go and buy the in local pharmacy. [FGD with men, Phase 1]

Additionally, finance challenges intersected with HR as many facilities had shortages of staff, compelling a nurse or doctor to act as a financier or bursar/accountant.

3.3.2.3. Human Resources

Widespread staffing shortages prove to be the greatest challenges in terms of HR. This was in part due to a recent nationwide exercise to verify employees' certificates in their places of work. Those who were determined to be unqualified were removed or had to leave their positions. This led to HR shortages.

We make sure we have proper employees. The action of verifying the employees' certificates reduced some employees, meaning that we have now deficiency of human resources… [KII with DHS, other]

Additionally, increasing numbers of schools and health facilities were struggling to meet HR needs with competent and skilled staff. A shortage of health facility staff sometimes caused delays, and compromised service quality. In education, while stakeholders discussed improvements due to the free education policy, they also noted challenges faced due to staff shortages.

Community members and key informants noted, because of the emphasis on qualifications and skills and a greater encouragement for women to seek job opportunities, that there is a perceived improvement in equity in employment selection.

3.3.2.4. Information Systems

While information systems were regarded as positive, they may be constrained by contextual factors. For example, notable challenges in the systems were related to the poor/lack of availability of internet services and electricity services. For instance, while the workers were supposed to use the internet to operate the systems, the government had not established how these workers should access the bundle for internet provision and thus they reported using their own money to buy internet bundles. Additionally, while communication channels have improved, contextual challenges remain.

> *…we have improved somehow but we still need more changes. As I said earlier, the citizens had only two options of getting the information. The first one was through radio and another one was to visit our notice boards to see what we have pinned. Now, at least, we have this website. People can visit it to see what is going one and they can send us some feedbacks easily via mobile phones. We cannot move forward if we don't solve the existing challenges that we have right now. The major challenges are communication networks and transport systems. We cannot get immediate responses from the citizens if we have unstable networks. And remember, these systems depend on the strong network. There are remote areas which are not reachable, and people are required to spend a lot of money for transport. People may pay up to 20 thousand to arrive at our office here…* [KII with ICT officer, Phase 2]

Additionally, IT challenges intersected with HR. Many facilities had staff shortages, compelling the service provider to work as an IT person. The transfer of workers sometimes created gaps where trained personnel were transferred without an equal replacement. We also found that in some cases the workers trained in an intervention area would be transferred to a nonintervention area, thus contributing to the improvement of information system use in that new area.

Despite slow growth in the availability of technology, there has been greater understanding of IT services and its relation to other issues. For example, one KII discussed information communication technology (ICT) and its changing role in governance.

> *I can say basing on ICT, people used to call us computer analysts and most people didn't know what exactly we were doing…so we were perceived as useless people. But, due to advancement in technology we are now valuable. We now participate in council meetings and are a part of decision making.* [KII with ICT officer, Phase 1]

3.3.3. Evaluation Question 6

These subsections provide the qualitative findings for evaluation question 6: What challenges remain in system functioning and community engagement and governance and how do stakeholders and community members recommend these be addressed?

3.3.3.1. Community Engagement and Governance

In control areas, citizens' understanding of their responsibilities in development and attending of important meetings that involve decision-making has remained limited. Expansion of LGA councilor training and support to engage citizens may address this challenge, as LGA councilors discussed these as key successes. However, some supportive communication mechanisms, such as comment boxes, are not yet fully accepted by communities due to the lack of trust and explanation of use.

> *I see that in order to place that comment box first everyone should be given education about the uses of the comment boxes through organizing and attending meetings in the society. We need to know the people who are in charge of the boxes so that we can be able to know how to post our claims and reach main office. This will help to minimize some disturbances to people, for example there is a certain leader who came and people expressed all their claims to him but later on some people were taken under security for more clarifications. Those were the disturbances that were facing us so we would like the people in charge to work properly to avoid those disturbances.* [FGD with men, Phase 2]

In addition to better publicity on comment box use, community participants suggested outreach via means like radio and television notices, community meetings, and postings in health facilities and schools in order to engage citizens.

Budget limitations and misaligned priorities created challenges within and among government levels. Some promises made by LGA leaders and politicians are not always fulfilled, making community members' efforts to participate in governance seem futile.

> *At the district level we follow good chain of command, the problem is orders from the central government, they finance things that are not in the O&OD and this is the reason why projects fail…the response to our O&OD comes down from central government as orders, I suggest that central government personnel should also get PS3 training.* [REM with LGA councilors, Phase 1]

> *You may sometimes get unwanted help. For example, you may ask for a store construction but their priority is maybe in community-based organization, for instance the issue of water and desks or laboratories.* [KII with DPLO, other]

Many key informants recommended that central government processes (like O&OD) be better aligned with local plans.

Although many participants reported recent improvements in accountability and transparency, there were still many who saw challenges remaining.

> *We have a problem here. I have not seen any meeting for a long time. Our member of parliament have not arranged for any meeting to talk to his people here in Kilosa. It is very rare to see him and even if he comes for a reason that brought him here, it's not for listening for what people want to tell him or solving the problem of the people here. They are not accountable people and not accountable for their people.* [FGD with men, Phase 1]

In both control and intervention areas, councilors requested increases in allowances, which falls beyond the scope of PS3.

3.3.3.2. Finance

Limited funds to achieve activities continue to be a challenge, seen in terms of shortages of supplies, equipment, and the required levels of infrastructure in both schools and health facilities. Community members discussed the limited availability of health services and service providers, noting there is a shortage of medicines in public facilities. Several community members also discussed challenges with housing for health providers.

> *Sometimes your patient needs services in the middle of the night, but you might find only one nurse while doctors stay far from the hospitals. Sometimes the nurse in charge of the shift stay far from the hospital, so she can't operate alone in the hospital premises. So, the main challenge is houses for health care providers.* [FGD with women, other]

Many of the suggestions provided by stakeholders and community members on this matter fall outside the scope of PS3, including ensuring funds are available from the central government to enact policies. However, issues arising around budgeting for a growing population can be addressed by trainings.

While community members discussed increased engagement in income-generating activities, there is a need for capacity building in numerous groups on issues related to management of funds, generation of capital and profit, as well as with record keeping. Expansion and institutionalizing of the training offered through LGA institutes may improve self-functioning with little supervision and changing of mindsets of citizens and staff.

> *...we have a task to do in terms of changing the mentality. Because, one of the important things is most of the interventions that are coming through PS3 and the government are going to change the management culture and roles and relationships. It is not an easy thing to manage. Like now, if you are saying, okay, the LGAs were responsible for basket funding, now the management is straight to the facility, we need to make sure we work together with the government to come up with a strategy to make sure that this local government authority management, they don't just move away from supporting the facilities. They have to make sure, like okay, this is a positive change, we have to help the facilities to make sure they have good plans and budgets, they have good financial management skills over time, and keep on mentoring, so it is something that I feel like there is still a change to make sure it is realized...* [KII with program]

Additionally, restricted access to finance systems was perceived to limit their utility and create challenges.

One of the [suggested] changes is that the system users should be allowed to access the system. I faced problems getting access to FFARS as a system. We had to use accountants at the health centres. There was a time period when we had problems with respect to health centres not uploading revenue reports. I would ask them and they would tell me they already did it. I was compelled to ask an accountant so he could help me have access to the system using his account. I was supposed to have a user name and password so I could have access to the system. I also have subordinates who need to have accounts so they can access information. There is a RBF coordinator who should have an account. I also have a secretary whose responsibility is to manage the councils' revenues with regard to planning, monitoring of financial and human resources, as well as infrastructure and things like that. It does not make sense that they are the coordinators, yet they do not have accounts. That is a challenge, they cannot know what is going on in the system. [KII with district medical officer, Phase 1]

There are multiple systems, such as FFARS, PlanRep, and Epicor, that perform various functions in financial planning and management. For example, stakeholders can budget through systems such as PlanRep, distribute funds through Epicor, and track expenses through FFARS. Interoperability of these systems was frequently discussed as a possible area for improvement.[5]

3.3.3.3. Human Resources

Although respondents noted improvements in general for health and education systems, staffing shortages and poor job performance concerns remained at the service delivery level. Community participants commonly noted concerns with health service delays, too few staff at health facilities, staff not working, and too few teachers with growing numbers of students.

You get to the hospital and you are told there are only three doctors, but none of them is in the office. You spend a long time waiting for them in vain. I suggest that they work on that problem. [FGD with men, other]

Most potential solutions offered would be outside the scope of PS3. For example, increased housing for health staff to ensure their availability would require financial resources from the central government.

Currently, the government has made sure that people are taking the positions according to their qualifications. Stakeholders recommended that the government continue ensuring well-qualified employees, but also provide the right benefits to those who remain; an example noted was appropriate promotions, considering that promotions were stopped during the verification period.

The 2016/2017, 2017/2018 financial years' implementations are still silent in case of promotions, but recently the government has allowed recategorization for the 2015/2016 financial year in the 2017/2018 financial budget. Therefore, the public servants who were to be recategorized in 2016/2017 and 2017/2018 financial year are still waiting. I would highly recommend to government to speed up a process in order to allow them get recategorized. [KII with DHRO, Phase 1]

Some participants also noted concerns with using the WISN tool. They noted that certain categories of personnel are not tracked and that the data being used for the analyses can be incorrect, leading to faulty staffing needs assessments.

The record keeping system was not good. You find out that there is a lot of work that is done at the health centre, but only a small chunk of that work is recorded. That is what WISN does, analyses recorded data. You look at the recorded data and you may be led to believe that the respective health centre does not need more personnel. I think they should conduct a new survey. Currently, many centres have become accustomed to keeping records as is reflected in the data. [KII with DCDO, Phase 2]

3.3.3.4. Information Systems

As mentioned, trainings were held with specific individuals who were expected to then train others. Some stakeholders complained that those trained were not always the best choices; for example, not including supervisors in trainings may limit the understanding of system usefulness, trust in the system, and the ability to perform job functions.

[5] Interoperability of some of these systems is in process but not yet full rolled-out at the time of data collection.

I got some kind of training when I came here. But you [PS3] now concentrate much on training secretaries, ignoring other administrators. I remember that you once conducted a three-days training. DMOs were not there! How dare you invite and train the secretaries and recruitment officers on how to distribute health sector servants and not District Medical Officers who head district health departments? [KII with DMO, Phase 2]

Additionally, some stakeholders requested the trainings to be longer, more frequent, and not conducted in or near their workplace to avoid being drawn back to their duties during the training.

Interviews with mentors have noted that reaching out to all staff in various cadres with training has been a challenge in some areas (especially in low-performing LGAs) over others. While the training-of-trainers approach can help some, not all come with the same base-level capacity.

...yeah, that is why I tell you, you know some are ignorant to computer, many people at the level of primary school especially. Head teachers who are accounting officers among them studied during ancient time, so computer for them is a taboo or problem... [KII with finance mentor, Phase 1]

Respondents noted that, for the information systems to properly function, there is need to improve the availability of internet services, especially in rural areas. It is important that this is included in the budgeting and that staff are not expected to use their own money to cover internet services. There were reports of staff having to do so:

… People are using money from their pockets to purchase the [internet] bundles. Basically, these systems require the internet access but there are no well-established infrastructures to support them... [KII with DPLO/intervention, Phase 1]

Other suggestions, such as improving electricity supply and reducing the cost of smart phones may be beyond the scope of PS3.

Most notably, many stakeholders discussed how different information is located in different systems. It is recommended that systems become integrated and/or interoperable.

…what I would recommend is that these systems should communicate, meaning that they need to be integrated with each other. Example, if possible Lawson should integrate with PlanRep because we do manpower statement in PlanRep, it is better if possible to also be integrated in Lawson and again to be implicated in the PlanRep system; meaning that these systems should communicate if a person needs to check the employees' salary statements in the budget, check for number of employees either through Lawson which is improved but also can get all this information in the PlanRep system. The same there should be the possibility to import this information from/or to PlanRep from/ or to Epicor for different usage... [KII with DED, Phase 2]

Through the program documents, the evaluation learned that the process of making some of these systems interoperable is planned (Table 37), and in some cases underway, though very few LGAs had been reached by the time of this evaluation. In the specific case of Lawson and PlanRep, it did not appear that PS3 plans to integrate these, but these plans may have evolved.

Table 37. Integration between system and type of data transferred/exchanged

Interoperable systems	Direction of data transfer	Data exchanged
PlanRep and Epicor	Epicor to PlanRep	Budget (revenue and expenditure)
	PlanRep to Epicor	Budget changes and reallocation
	PlanRep to Epicor	Actual expenditure for reporting execution
	Epicor to PlanRep	Revenue received
Epicor and FFARS	FFARS to Epicor	Summary of actual expenditure
Epicor and LGRCIS	LGRCIS to Epicor	Summary of daily actual revenue
	LGRCIS to Epicor	Prepayments of revenue
PlanRep and FFARS	FFARS to PlanRep	Summary of actual expenditure

Source: PS3 Year 3, quarter 2 report.

4. LIMITATIONS

4.1. Limitations of the Quantitative Data

4.1.1. DHIS2 Data Strengths and Limitations

Health care services in Tanzania are provided by public, private, faith-based, and nongovernmental organizations. The public sector, which includes faith-based organizations, accounts for the bulk (84%) of the service provision with an extensive network in both rural and urban areas. The point of care data collection and management practices vary between the public and private sectors. For the most part, public health facilities rely on paper-based data collection systems. In the private sector, electronic data capture and management is common. The public sector is also rolling-out a new initiative to strengthen electronic data capture at the point of care through the Government of Tanzania Health Operations Management Information System (GOTHOMIS).

The health management information system (HMIS) provides critical data on those who go to health facilities for a variety of services. Besides diagnosis and drug dispensing information, these systems capture essential client characteristics, such as sex, age, and residence, that are critical for effective service delivery. However, these data are often not fully processed, analyzed, and used.

With specific reference to paper-based systems, there are concerns about the quality of data collected in terms of completeness, accuracy, and timeliness. The data quality problem is exacerbated by the data collection burden placed on health care workers for transcribing data, and tallying and reporting data into the HMIS. Pressed for time against a long patient waiting list, health care workers may be inclined to record only the most essential data for patient care, omitting other critical background characteristics.

As part of its efforts to improve the quality of data generated through routine health information systems, the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC) adopted in 2010 the District Health Information Software (DHIS), developed by the University of Oslo in 1994, for routine data management. The original version of the DHIS was designed as a tool for aggregating routinely collected data across all public health facilities in a country. The aggregated data would facilitate data analysis, forecasting of required services, and evaluating health care worker performance. In 2013, an improved version of the software, called DHIS2, was launched. The new version provides advanced features for data capture, including the capability of inputting data using various electronic tools, such as computers, laptops, tablets, and smartphones, as well as data analysis and visualization. DHIS2 is also interoperable with other data management systems, for example, human resource information systems and logistics management information systems, thus improving its capacity to serve as a one-stop health data warehouse. Tanzania is among nearly 50 low- and middle-income countries that have adopted DHIS2 as a national health management information system.

The introduction of DHIS2 has helped to improve data management by allowing access to data at national and subnational levels, enabled by it being a web-based application. DHIS2 offers the capability of creating customized indicators, with accompanying visualization. However, as promising as it is, DHIS2 is affected by general challenges to the routine health information system (RHIS), which can be grouped into three categories—technical, behavioral, and organizational. The common technical challenges relate to the ease of using data collection tools and information and communication technology. A key technical challenge in Tanzania is the burden of data collection at the point of care. With up to 16 registers and other reporting forms in use, some of which collect duplicative data, frontline health care workers face enormous data management challenges. When data captured into the source document is incomplete or inaccurate, subsequent use of an electronic data management system, such as DHIS2, does not ameliorate the quality problems.

There are other technical challenges related to denominators. DHIS2 uses the health facility as the lowest organizational unit for generating indicators. Denominators for calculating health facility level indicators are derived from census and population projections. The denominators may not be accurate in that we could not assess how well the population projected models estimate the actual size of relevant denominators, especially considering potential changes in population over time. Successive annual health sector performance profile reports (AHSPR) have alluded to this challenge. For instance, the 2015/2016 AHSPR notes, "data quality issues are suspected during capturing of the primary data, and around determination of denominators from population projections" (AHSPR, page 39). Additionally, these denominators are different from those reported in the Tanzania DHS, so there are likely discrepancies in the values of indicators in this report compared with those found in the DHS.

From a behavioral perspective, a pervasive culture of health data use is yet to be experienced in Tanzania, partly due to limited knowledge, poor attitudes, and lack of value for data, as well as a lack of motivation for using data. Health care workers at the interface of service delivery and routine health data collection often see their role primarily as that of reporting the data collected to higher levels, rather than using the same data to improve patient care or service quality. Even among those who may be motivated to use data, clear guidance on their scope for taking actions based on the data may be lacking. When data are not adequately used, quality issues may not be easily picked out.

Organizational challenges occur at multiple levels and reflect information culture, health system structure, roles and responsibilities, and resources. The key challenges in Tanzania include shortages of staff, in some cases leading to task shifting of data management responsibilities to staff with no requisite skills; stockout of standard registers, leading to improvisations that can compromise data quality; and lack of supportive supervision and feedback mechanisms.

The analysis presented in this report identifies indicators that may have been affected by data quality problems. Data was often incomplete and did not span the preferred range to establish longer-term trends prior to the start of PS3. Although DHIS2 started in 2013, not all LGAs were covered during this year. Therefore, most service utilization indicators only have complete data from 2014, which was 1.5 years prior to PS3. HR and financial data were only available yearly, as opposed to quarterly, which was available for service utilization indicators. HR data was also not available for all years. All of these challenges reduced the number of time points available for analysis in the time series. Furthermore, there were apparent data quality issues reflected in the values of the original data. Some indicators originating from DHIS2 had values well over 100 percent, even extending beyond 1,000 percent for some years. Problematic LGAs and quarters/years were identified, but such values call into question the quality of entire datasets. Additionally, we could not identify data problems in values less than 100 percent or for indicators that were not measured in proportions, such HR and financial ratios.

Newly implemented information systems also may have affected measurement error that is indistinguishable from program effects on the indicators. Despite quantitative results being presented as averages, there was great variability in the indicator values at the LGA level. This variability is captured by the confidence intervals presented in the graphs. However, considering the changes in information systems, there was likely measurement error, which could have been particularly high when these systems were newly implemented. We cannot determine how this measurement error evolved over time or how much measurement error is responsible for the variability observed in the indicators. It is impossible to parse out effects due to reduced measurement error over time from effects due to the other factors.

Additionally, there were issues at the LGA level which imposed limitations on this analysis. The total number of LGAs differed depending on the data source and indicator type, and it also changed over time. The inconsistency in the total number of LGAs in the different datasets was likely a result of the partitioning of new LGAs from old ones. The analysis used in this report aggregated data by PS3 and non-PS3 areas, so it is likely that the effect of these changes is mitigated through the use of averages. However, we cannot know exactly how the creation of new LGAs may have affected the quality of the data. We also did not have data on LGA characteristics, which could have allowed us to identify underlying factors associated with the observed changes over time and with the variation of the indicators within PS3 and other regions.

We recommend interventions for continued strengthening of HMIS through training of existing staff, hiring of new staff as necessary, and improvement of data quality through regular data quality assessments. Deliberate efforts are also necessary to promote the use of the data collected through regular data reviews (for example, monthly or quarterly), with a view to increasing service coverage and improving data quality.

4.2. Limitations of the Qualitative Data

It is possible that participants did not feel comfortable sharing negative opinions about PS3, as the project is closely aligned with the government and all participants work with or for the government in some manner; they may have felt that there could have been retribution if they reported too negatively. Also, it was difficult to discern differences between the PS3 and non-PS3 areas, but this may be because many of the PS3 activities were extended to non-PS3 areas, rather than due to poor project performance. Lastly, as a cost-saving measure, the qualitative data was not collected in all PS3 areas; it could be that the areas from which we did not sample have had differing experiences with PS3 and these results may not reflect the experiences of those clusters outside our sample.

5. DISCUSSION AND PROGRAMMATIC RECOMMENDATIONS

5.1. Summary of Results

Table 38 (identical to Table E.1 in the Executive Summary) summarizes the evaluation results, describing the types of trends and estimated time trend differences. Columns under the heading "PS3 areas' general trend" depict the overall directionality of changes over time in PS3 areas. It is important to note, that, although this section of the table only describes PS3 area trends, general patterns between PS3 and other areas were similar, despite having different levels for most indicators.

Table 38. Summary of time trend and annualized changes in indicators

Indicators	Significant	PS3 areas' general trend (based on graphs)				PS3 compared with other areas (based on DID estimates)					
		Improving trend	About the same or stable trend	Volatile trend	Worsening trend	Significantly better in PS3 areas	Better, but no significant difference	Significantly protective in PS3 areas	Protective, but no significant difference	Worse, but no significant difference	Significantly worse in PS3 areas
• ANC coverage before 12 weeks gestational age		x					x				
• Pregnant women attending ANC 4+ times		x					x				
• Prevalence of pregnant women receiving IFA supplementation for 90+ days				x						x	
• Pregnant women receiving TT2+ at ANC				x					x		
• Women tested for anemia at ANC	x	x				x					
• Women tested for syphilis at ANC	x	x				x					
• Deliveries taking place in health facilities		x							x		
• Births assisted by skilled attendants		x								x	
• Mothers receiving postnatal care before 7 days	x	x				x					
• Prevalence of low birth weight		x					x				
• Measles vaccination coverage				x						x	
• Penta3 vaccination coverage				x						x	
• ANC partners HIV testing rate		x					x				
• HIV-exposed infants receiving first HIV test within 2 months after birth	x	x						x			
• HIV-exposed infants initiated on cotrimoxazole within 2 months after birth	x	x						x			
• Couple HIV counseling and testing at ANC		x								x	
• Contraceptive prevalence rate			x							x	
• Health facilities with RCH tracer drugs package				x						x	
• PE per capita in health		x					x				

Table 38. Summary of time trend and annualized changes in indicators (continued)

Indicators	Significant	PS3 areas' general trend (based on graphs)				PS3 compared with other areas (based on DID estimates)					
		Improving trend	About the same or stable trend	Volatile trend	Worsening trend	Significantly better in PS3 areas	Better, but no significant difference	Significantly protective in PS3 areas	Protective, but no significant difference	Worse, but no significant difference	Significantly worse in PS3 areas
• PE per capita in education		x					x				
• OC per capita in health					x					x	
• OC per capita in education	x				x			x			
• Nurses per population			x						x		
• Doctors per population			x						x		
• AMOs per population	x		x					x			
• Health care workers that are female		x					x				
• Primary school student-teacher ratio					x					x	
• Secondary school student-teacher ratio		x								x	
• Primary school students that are female			x						x		
• Secondary school students that are female		x							x		
• Primary school teachers that are female	x		x								X^
• Secondary school teachers that are female			x							x	
Total	**8**	**17**	**7**	**5**	**3**	**3**	**7**	**4**	**6**	**11**	**1**
Total significant and favorable	**7**										

Note: None of the indicators were improving in PS3 areas only or worsening in PS3 areas only.
^: Results for this indicator should be interpreted with caution, see text.

Trends were categorized as *improving, stable, volatile,* and *worsening,* based on the direction of the lines from the first time point for which data was available to the last. For example, some indicators, such as ANC attendance, were categorized as *improving* because levels increased over time, while others, like the prevalence of low birth-weight, were considered to be improving due to decreasing levels over time. In fact, we observed improving trends in both areas for 17 of the 32 indicators, most of which pertained to health service utilization. For 12 indicators, trends did not generally improve or worsen. We observed *stable* trends for seven of these indicators, defined as having overlapping confidence intervals for all adjacent time points, as well as the first and last time points. The other five indicators were categorized as having *volatile* trends, meaning that we observed drastic variation in the levels of indicators at different time points. *Volatile* trends were defined as temporary directional changes occurring for more than one time point, that were so drastic there was no overlap with at least one confidence interval at an adjacent time point.[6] Most of the indicators with volatile trends were supply-side sensitive, and thus likely reflect changes in supply conditions.

Three of the indicators *worsened* over the observed time period. Two of them were the OC per capita indicators, which showed declining trends, but they stabilized at the end of the observation period. For primary student-teacher ratios, *worsening* meant increasing levels, as an improvement would actually be a reduction in the absolute student-teacher ratio value—as long as enrollment has not decreased. For *worsening* and *improving* indicators, there is no overlap in the confidence intervals at the first and last observed time points.

Also, in Table 38, columns under the heading "PS3 compared with other areas," qualitatively reflect the differences in time trends between PS3 and other areas, comparing the differences before PS3 and PS3 active time periods between the two areas. Estimates were significant for eight indicators. The estimated values for the changes in the rates for all indicators can be found in Table 39. For three of these indicators, PS3 areas *improved* significantly more than other areas between both periods, all of which pertained to maternal health service utilization: the percentages of pregnant women tested for anemia and syphilis at ANC and the percentage of women attending PNC within a week of delivering.

However, not all of the significant effects were absolute improvements. For another four indicators, we observed significant effects that were protective. "Protective effects" were indicators that were worsening in both areas, but PS3 regions worsened at slower rates than other areas. Two of these indicators with significant *protective effects* pertained to the prevention of HIV transmission from mother to child: the percentages of HIV-exposed infants tested for HIV and initiated on cotrimoxazole within the first two months.

Finally, there was one indicator, the percentage of primary teachers that were female, that was classified as significantly *worse* in PS3 areas, but this requires caution in its interpretation. The annualized change decreased in PS3 regions and increased in other areas between the two periods. However, this result should be taken cautiously as the levels of this indicator have been stable, at just below 50 percent in PS3 regions in the PS3 active period and just above 50 percent in other regions, which would be considered the level of gender parity.

[6] For some indicators, such variation across time is seen in the first time points of available data. These indicators were not considered to be volatile, as the changes might reflect new data collection systems, and trends remain steady thereafter. Additionally, volatile trends were, overall, nonworsening. If confidence intervals for the first and last time points did not overlap and were generally worsening, relevant indicators were categorized as worsening.

Table 39. Summary of annualized changes in indicators and differences between PS3 regions and other areas

Indicator	PS3 regions			Other areas			DID estimate [6-3]	DID P-value
	(1) Before PS3	(2) PS3 active	(3) Difference [2-1]	(4) Before PS3	(5) PS3 active	(6) Difference [5-4]		
• ANC coverage before 12 weeks gestational age	-1.99**	6.72**	8.71**	-2.41*	4.12**	6.53**	2.18	0.183
• Pregnant women attending ANC 4+ times	2.40*	9.07**	6.67**	3.44**	9.31**	5.87**	0.79	0.754
• Prevalence of pregnant women receiving IFA supplementation for 90+ days	8.41**	2.27**	-6.14**	6.44**	1.70*	-4.75**	1.39	0.463
• Pregnant women receiving TT2+ at ANC	3.44**	0.72	-2.72**	7.28**	1.87**	-5.41**	2.69	0.059
• Women tested for anemia at ANC	-1.05**	9.08**	10.13**	4.14*	4.68**	0.54	11.99**	0.001
• Women tested for syphilis at ANC	10.32**	15.44**	5.12*	17.53**	7.42**	-10.12**	15.24**	0.000
• Deliveries taking place in health facilities	4.43**	2.47**	-1.96**	3.95**	1.94**	-2.01**	0.05	0.954
• Births assisted by skilled attendants	5.79**	2.29**	-3.50**	3.94**	1.58**	-2.35	-1.14	0.525
• Mothers receiving postnatal care before 7 days	-1.39	5.22**	6.61**	3.46**	3.19**	-0.27	6.88**	0.006
• Prevalence of low birth weight	-1.89**	-0.12	1.76**	-2.11**	0.18	2.30**	-0.53	0.413
• Measles vaccination coverage	7.57**	-1.07**	-8.64**	9.98**	2.56*	-7.41*	-1.22	0.752
• Penta3 vaccination coverage	5.43**	0.19	-5.23*	6.15*	3.28	-2.86	-2.36	.0588
• ANC partners HIV testing rate	3.56	7.34**	3.77	7.81**	6.75**	-1.06	4.83	0.070
• HIV-exposed infants receiving first HIV test within 2 months after birth	20.08**	-2.70**	-22.78**	38.19*	-2.64*	-40.83	18.06**	0.000
• HIV-exposed infants initiated on cotrimoxazole within 2 months after birth	22.40**	-3.62**	-26.02**	39.88**	-2.68*	-42.56**	16.54**	0.000
• Couple HIV counseling and testing at ANC	10.71**	7.28**	-3.42**	11.38**	8.58**	-2.80**	-0.62	0.772
• Contraceptive prevalence rate	0.36	-0.69	-1.05	0.14	-0.80	-0.94	-0.11	0.955
• Health facilities with RCH tracer drugs package	11.00**	4.36**	-6.63**	9.82**	4.03**	-5.79**	-0.84	0.645
• PE per capita in health	-316.20	332.65	648.85*	783.97	523.61	-260.36	909.21	0.147
• PE per capita in education	-704.69	4,481.45**	5,186.14*	3,256.14*	3,043.04*	-213.11	5,399.24	0.054
• OC per capita in health	-244.52**	9.94	254.46**	-300.82**	96.73	397.54**	-143.08	0.269
• OC per capita in education	-1,575.64**	-221.66	1,353.98**	-841.01**	-103.80	737.21**	616.76*	0.043

Table 39. Summary of annualized changes in indicators and differences between PS3 regions and other areas (continued)

Indicator	PS3 regions			Other areas			DID estimate [6-3]	DID P-value
	(1) Before PS3	(2) PS3 active	(3) Difference [2-1]	(4) Before PS3	(5) PS3 active	(6) Difference [5-4]		
• Nurses per population	0.46**	0.035	-0.43**	0.45**	-0.025	-0.48**	0.05	0.480
• Doctors per population	0.028**	0.028**	0.00	0.041**	0.019	-0.022	0.022	0.147
• AMOs per population	0.008**	-0.006**	0.002	-0.006	-0.010**	-0.005**	0.007*	0.016
• Health care workers that are female	-0.58**	-0.67**	0.09	-0.46**	-0.47**	-0.01	-0.08	0.678
• Primary school student-teacher ratio	-2.01**	5.30**	7.31**	-1.54**	4.92**	6.46**	0.85	0.322
• Secondary school student-teacher ratio	-3.88**	3.03**	6.91**	-2.77**	2.04**	4.81**	2.10	0.055
• Primary school students that are female	0.12**	-0.26**	-0.37**	0.12**	-0.28**	-0.40**	0.03	0.677
• Secondary school students that are female	1.16**	0.71**	-0.44*	1.35**	0.76**	-0.59**	0.15	0.612
• Primary school teachers that are female	7.12*	-0.38**	-7.50*	11.56*	-0.52	11.03*	-18.54**	0.003
• Secondary school teachers that are female	1.68**	-0.87**	-2.56**	1.00*	-0.62**	-1.61**	-0.94	0.072
** Significant at < 1%; * significant at <5%								

5.1.1. Many Observed and Perceived Changes Occurred Nationally

Generally, trends and perceptions show gradual improvements nationally, with very few differences between PS3 and other regions, or between PS3 phases. This could be a result of various factors. First, **many of the PS3 systems were adopted by GOT and rolled-out nationally**. This points to a gap that was filled early on, however does make assessing the effects of PS3 difficult.

In both PS3 and other areas, we found improvements in health outcomes, particularly among health center access and attendance-based services, such as ANC, 4+ANC, and facility deliveries. Qualitative results suggest these improvements may have been related to better understanding the importance of visiting health centers, particularly among pregnant women, as well as improvements in supportive infrastructure such as roads and the building of health centers.

As such, it is important to note that **PS3 is one in a constellation of programs contributing to public sector development**. This includes, as noted by qualitative participants, other USAID-funded programs such as Boresha Afya, which supports integrated service delivery at the health facility and community levels across the country. World Vision and Amref were discussed as improving awareness and education on health services, which draw patients to health centers. These programs work in both PS3 and/or other areas on outcomes similar to those targeted by PS3 and may particularly contribute to the improvements of health center access and attendance-based services.

Health outcomes that are more commodity-based, such as vaccinations, iron and folic acid supplementation, and RCH tracer drugs, saw greater variability. This was seen quantitatively by steep temporal dips in outcomes and reflected qualitatively in discussions of drug stockouts, insurance limitations, and avoidance of services all together when patients expect issues around commodity availability. Additionally, societal context may influence uptake of services. Just as improvements in facility-based deliveries required education and shifts from traditional norms, contraceptive uptake may require shifts around gender norms and decision making.

Broader policies may have heavily influenced observed and perceived changes. In 2015, the Tanzanian government issued Circular 5 which implements the Education and Training Policy 2014 and directed public bodies to ensure that education is free for all children. This was also recently met with another policy to ensure staff are properly qualified and certified for their positions. Those who were not deemed to be qualified were removed from their posts. So even as more students were attending school, fewer teachers were qualified and employed in public schools. As such, we found increases in student-teacher ratios after 2015 in both primary and secondary education. Similarly, in terms of health, stakeholders commonly discussed a shortage of health care workers. These issues influenced community members' perceptions of public sector performance.

Despite these restrictions, stakeholders perceived systems like those put in place by PS3 and GOT as valuable in creating efficiencies and improving public sector system performance. However, these systems are relatively new, and this perception may be compromised by long-term stagnation or issues around commodities. As such, **the program may require more time to realize changes in outcomes** beyond those seen in this midline evaluation. As this is a systems intervention that addresses many underlying facets of the public sector, it is anticipated that observed changes may still yet be seen.

5.1.2. Differences in Programmatic Interventions Seen Primarily at Lowest Levels

While we observed similar time trends for many outcomes at the aggregate level, where PS3 and other areas differed were often at the lowest levels of intervention. For example, PS3 stakeholders, particularly LGA councilors, identified **local community engagement and good governance as significant changes** coming out of PS3 programs. LGA councilors discussed having the knowledge and skills to attend to community members' needs and complaints. They also discussed improvements in transparency and accountability at the local level whereby citizens know and understand how money is allocated and expended for public services in their communities. In areas where PS3 did not provide trainings, councilors reported feeling less sure and identified supportive systems in local governance and transparency as a need.

However, these local gains may find challenges as they interact with regional and central priorities. For example, a commonly noted issue in creating development plans at the local level was the availability of finances and human resources to carry out these plans. So, LGAs developed plans and submitted them but often learned that central government had different funding priorities. This disconnect between local and central authorities was frustrating for LGA staff and councilors and reportedly negatively influenced the community's trust.

PS3 stakeholders also discussed **trainings on information systems as important in highlighting the value of these systems and encouraging their use**. There was positive perception of these systems overall, even in their nascency, however similar gaps between levels were observed, whereby supervisors of those trained may not have understood the value of the system or the data gathered from it. Just as gaps between levels of government may undermine development, gaps between levels of supervision as they relate to training may undermine system uptake and use. Also, staff turnover and system updates require that there are mechanisms for refresher trainings as well as ongoing training for new staff.

5.1.3. Gender Parity in Secondary School Teacher Employment Declining

Qualitative respondents noted a general perception that women were more encouraged to seek employment and that gender equity in government had been improving. And while we found gender parity or near gender parity for health care workers and primary school teachers, there were clear gender parity gaps for secondary school teachers across areas. A low proportion of secondary school teachers were female and there was a decreasing trend in this proportion. The reasons for this are unclear but these results suggest gender disparities in the formation and certification of secondary school teachers across regions. It is also possible that women were disproportionately affected by the efforts in recent years to reevaluate qualifications for civil servants. This warrants further investigation in the end line data collection and analysis.

5.1.4. Programmatic Recommendations

We provide the following recommendations for PS3:

Information systems

- Support internet service nationally or work with central/local government to plan for this in budgets and ensure staff are not paying for internet service out of personal funds.
- Investigate concerns with WISN staffing categories and accuracy of input data.
- Assess whether additional categories of staff may benefit from access to FFARS.
- Continue to work towards interoperability of information systems.
- Institute a mechanism to regularly communicate system updates/new features to users.

Training

- Carry out needs assessments at facilities prior to information system install, ensuring staff have capacity to use and maintain information systems, then train as needed.
- Ensure supervisors are invited or educated on why their subordinates are invited to trainings; since it may not be feasible or necessary to train them to the same depth as their subordinates; PS3 might consider developing a shorter, awareness-raising session aimed at this audience so that they at least feel engaged and understand the value of the systems.
- Consider establishing refresher trainings.
- Maintain and expand in-service support.
- Integrate how to plan for growing populations into LGA councilor budgets and development training.
- Continue good governance work but increase transparency (e.g., with suggestion boxes).

Citizen engagement and governance

- Address the disconnect between central and local government in planning and budgeting.
    - In trainings, set expectations on what to expect from the central government with regard to budgeting and planning (i.e., they may not receive all requested funds), and share messages to communicate with citizens so as to similarly set their expectations.
    - Increase understanding at the LGA level of how central government is making funding allocation decisions.
    - Increased work with central government to encourage better communication and collaboration with LGAs; for example, on funding priorities and timelines.
- Increase publicity of new accountability mechanisms and information sources like the new websites, health clinic comment boxes, etc.; for example, participants suggested making TV and radio announcement and posting notices at health centers and schools.

Gender

- Address secondary school teacher gender parity issues in HR efforts; for example, investigate potential barriers to recruiting and maintaining secondary school teachers that are female, and assess whether gender sensitivity training for teachers, students, and administrators may be needed to create environments where women feel respected and safe.

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APPENDIX A. PS3 IMPLEMENTATION REGIONS AND LGAS

Regions	LGAs/Districts
Dodoma	Bahi DC
Dodoma	Chamwino DC
Dodoma	Dodoma MC
Dodoma	Kondoa DC
Dodoma	Kongwa DC
Dodoma	Chemba DC
Dodoma	Mpwapwa DC
Dodoma	Kondoa TC
Iringa	Iringa MC
Iringa	Iringa DC
Iringa	Mufindi DC
Iringa	Mafinga TC
Iringa	Kilolo TC
Kagera	Bukoba MC
Kagera	Bukoba DC
Kagera	Ngara DC
Kagera	Biharamlo DC
Kagera	Misenyi DC
Kagera	Muleba DC
Kagera	Karagwe DC
Kagera	Kyerwa DC
Kigoma	Buhigwe DC
Kigoma	Uvinza DC
Kigoma	Kigoma/Ujiji MC
Kigoma	Kigoma DC
Kigoma	Kibondo DC
Kigoma	Kasulu DC
Kigoma	Kakonko DC
Kigoma	Kasulu TC
Lindi	Lindi MC
Lindi	Lindi DC
Lindi	Kilwa DC
Lindi	Nachingwea DC
Lindi	Liwale DC
Lindi	Ruangwa DC

Regions	LGAs/Districts
Mara	Musoma DC
Mara	Musoma MC
Mara	Tarime DC
Mara	Bunda DC
Mara	Rorya DC
Mara	Butiama DC
Mara	Serengeti DC
Mbeya	Mbeya CC
Mbeya	Mbeya DC
Mbeya	Mbarali DC
Mbeya	Rungwe DC
Mbeya	Busokelo DC
Mbeya	Kyela DC
Mbeya	Chunya DC
Mbeya	Mbozi DC
Mbeya	Momba DC
Mbeya	Tunduma TC
Mbeya	Ileje DC
Mbeya	Tunduma TC
Morogoro	Morogoro MC
Morogoro	Morogoro DC
Morogoro	Mvomero DC
Morogoro	Kilombero DC
Morogoro	Ulanga DC
Morogoro	Kilosa DC
Morogoro	Gairo DC
Morogoro	Malinyi DC
Morogoro	Ifakaara RC
Mtwara	Mtwara/Mkindani DC
Mtwara	Mtwara DC
Mtwara	Tandahimba DC
Mtwara	Newala DC
Mtwara	Masasi DC
Mtwara	Nanyumbu DC
Mtwara	Masasi TC
Mtwara	Nanyamba TC

Regions	LGAs/Districts
Mtwara	Mtwara DC
Mtwara	Masai DC
Mwanza	Mwanza CC
Mwanza	Ilemela MC
Mwanza	Sengerema DC
Mwanza	Ukerewe DC
Mwanza	Misungwi DC
Mwanza	Magu DC
Mwanza	Kwimba DC
Mwanza	Buchosa DC
Njombe	Njombe TC
Njombe	Njombe DC
Njombe	Makete DC
Njombe	Ludewa DC
Njombe	Makambako TC
Njombe	Wanging'ombe
Rukwa	Sumbawanga MC
Rukwa	Sumbawanga DC
Rukwa	Nkasi
Rukwa	Kalambo DC
Shinyanga	Sinyanga MC
Shinyanga	Shinyanga DC
Shinyanga	Kishapu DC
Shinyanga	Kahama TC
Shinyanga	Msalala DC
Shinyanga	Ushetu DC

APPENDIX B. INDICATOR TIME TRENDS STRATIFIED BY PS3 IMPLEMENTATION PHASE

Figure B.1. ANC started before 12 weeks of gestation

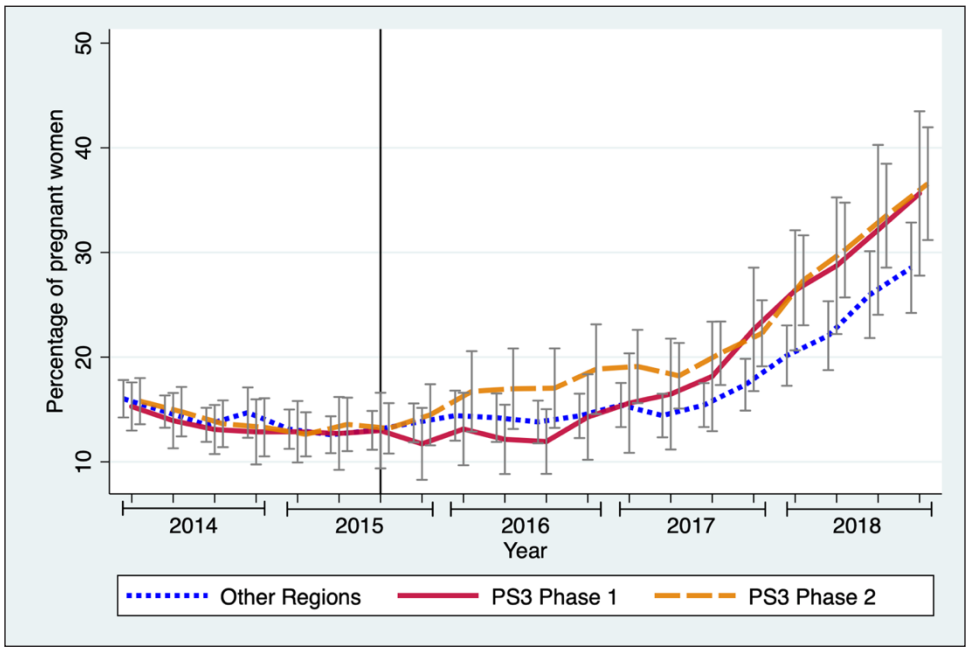


Figure B.2. ANC, at least 4 antenatal care visits

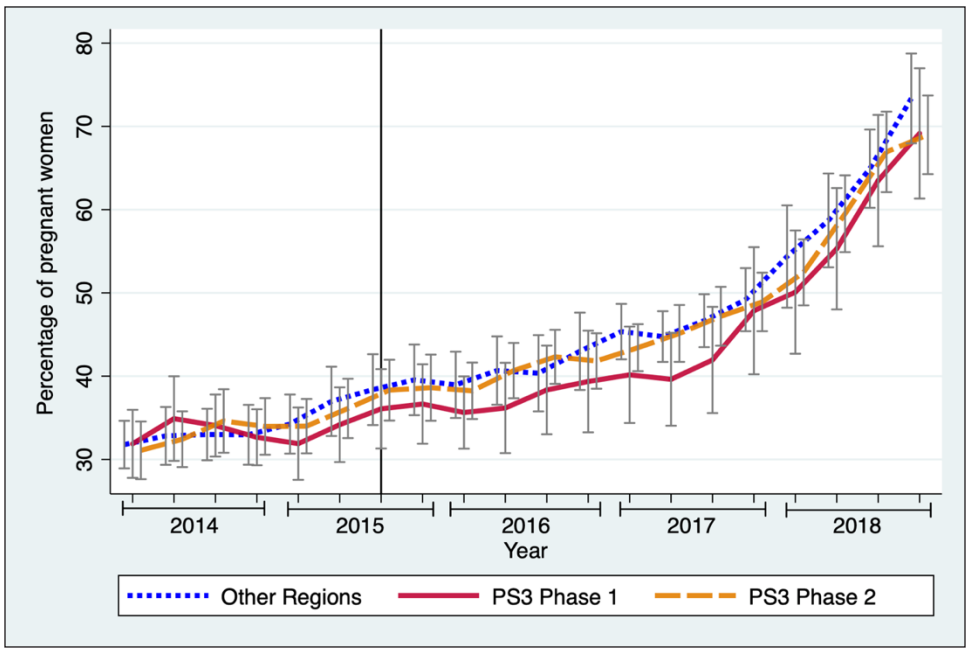


Figure B.3. Iron and folic acid supplementation in pregnancy

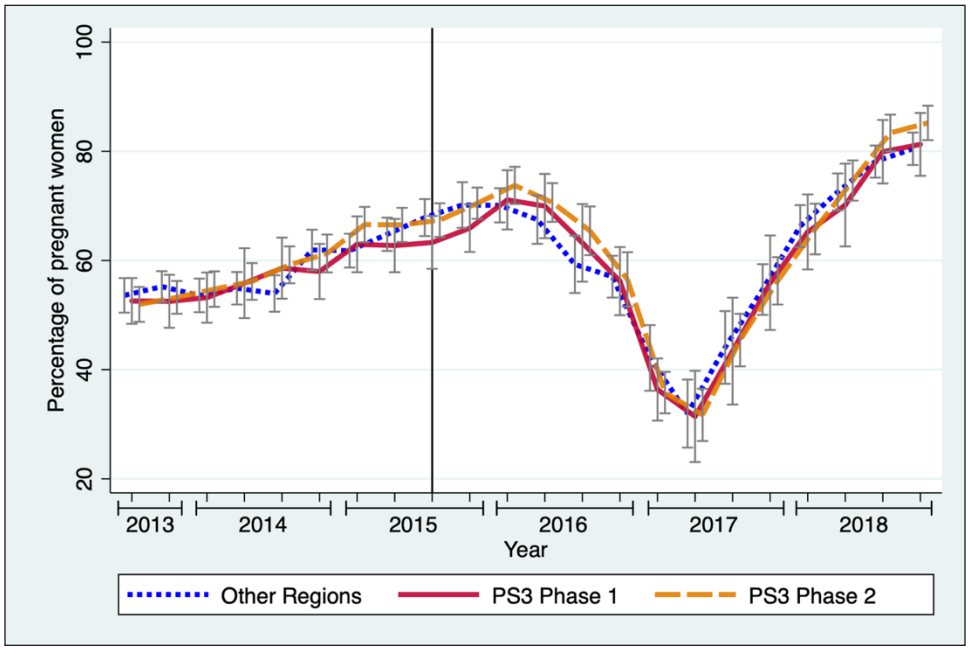


Figure B.4. Pregnant women receiving TT2+

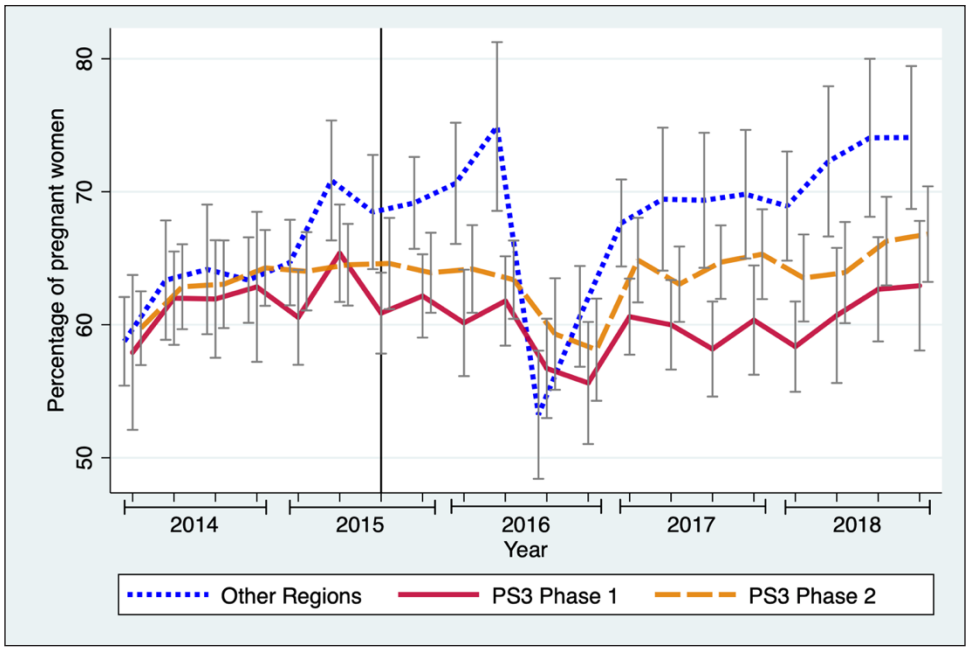


Figure B.5. Proportion of pregnant women tested for anemia

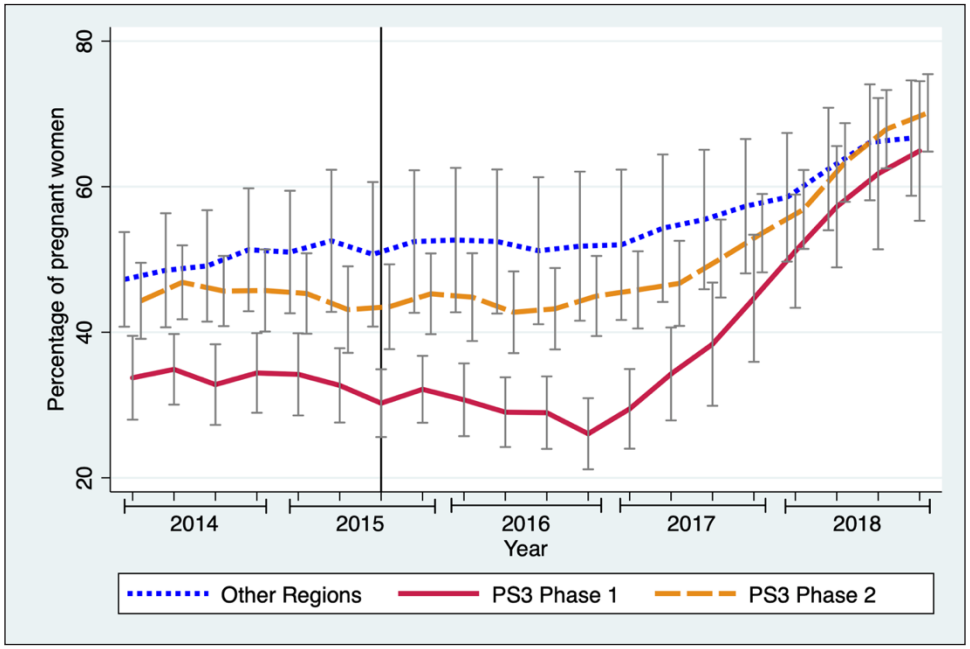


Figure B.6. Pregnant women tested for syphilis

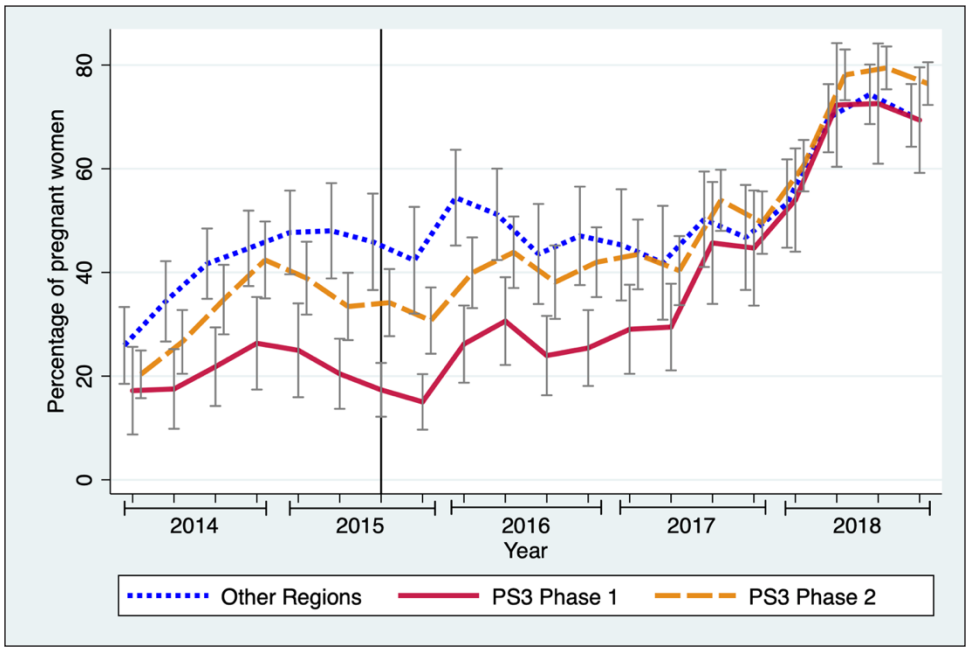


Figure B.7. Birth deliveries in health facilities

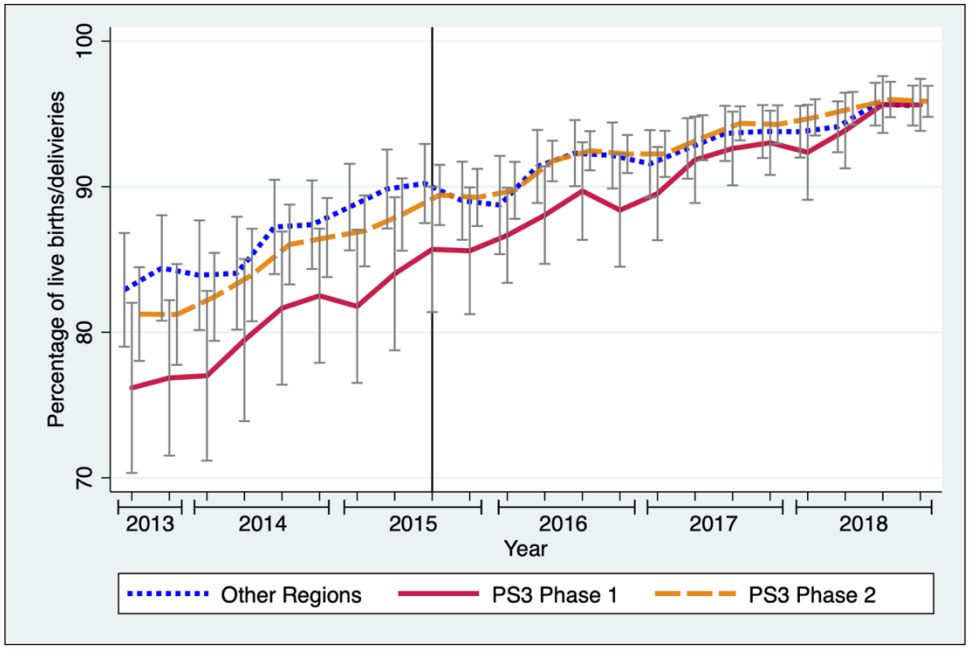


Figure B.8. Births delivered by skilled attendants

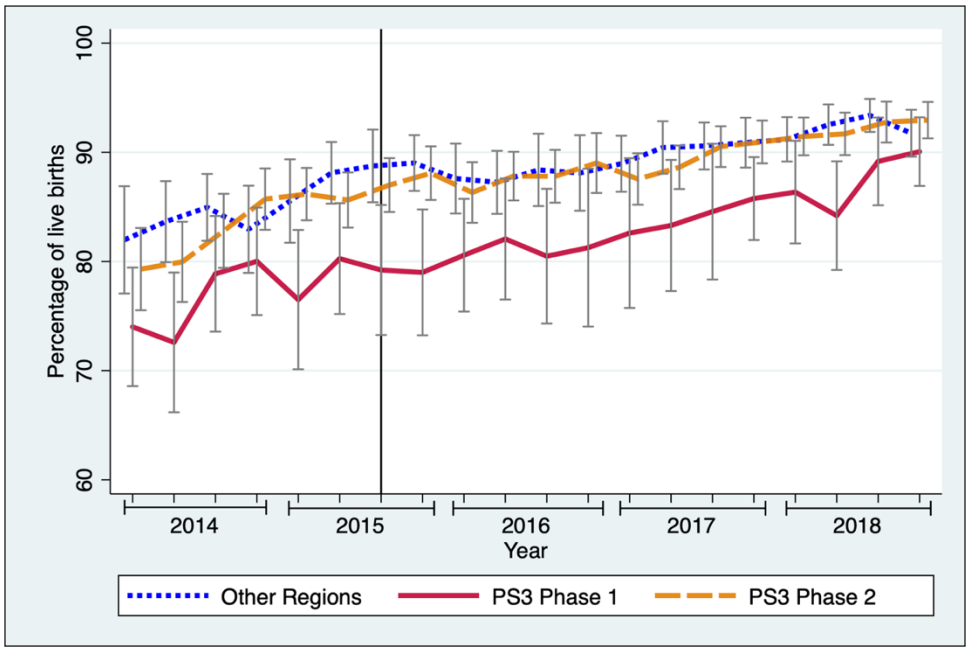


Figure B.9. Postnatal care within 7 days of delivery, for mothers

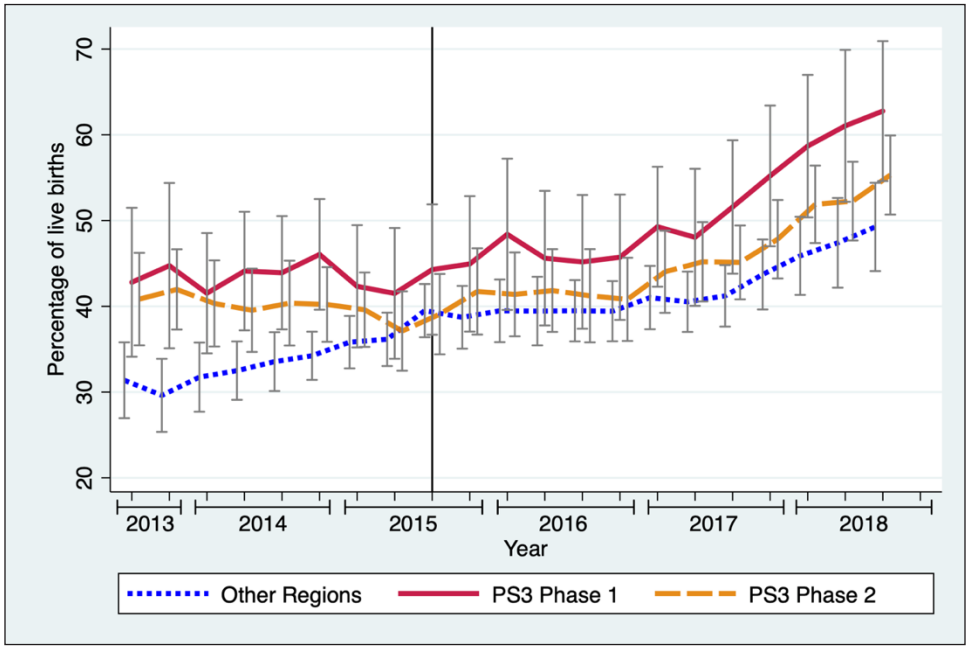


Figure B.10. Prevalence of low birth weight

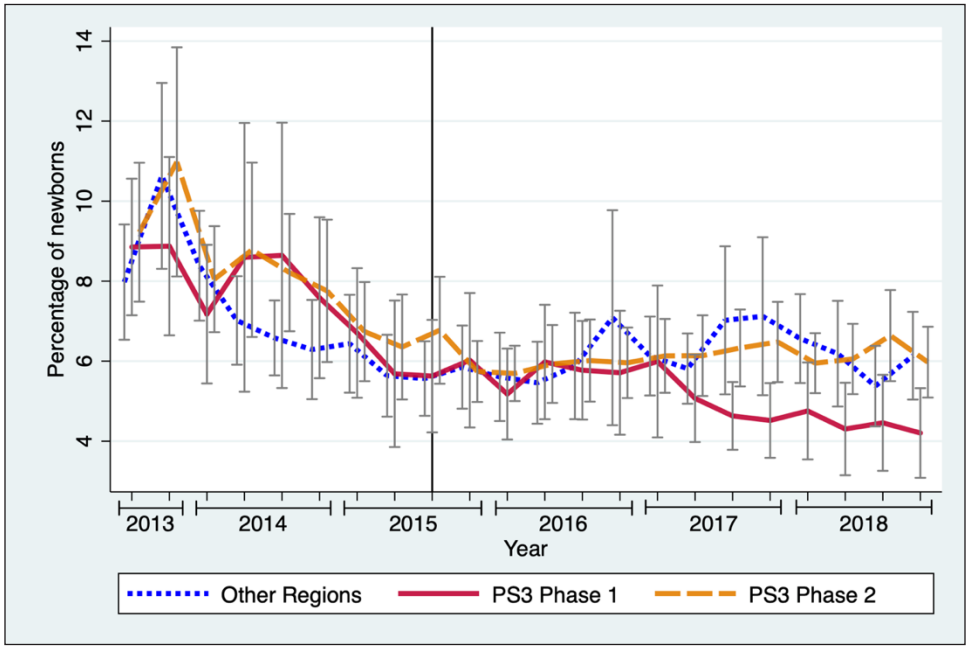


Figure B.11. Measles vaccination, inside service area

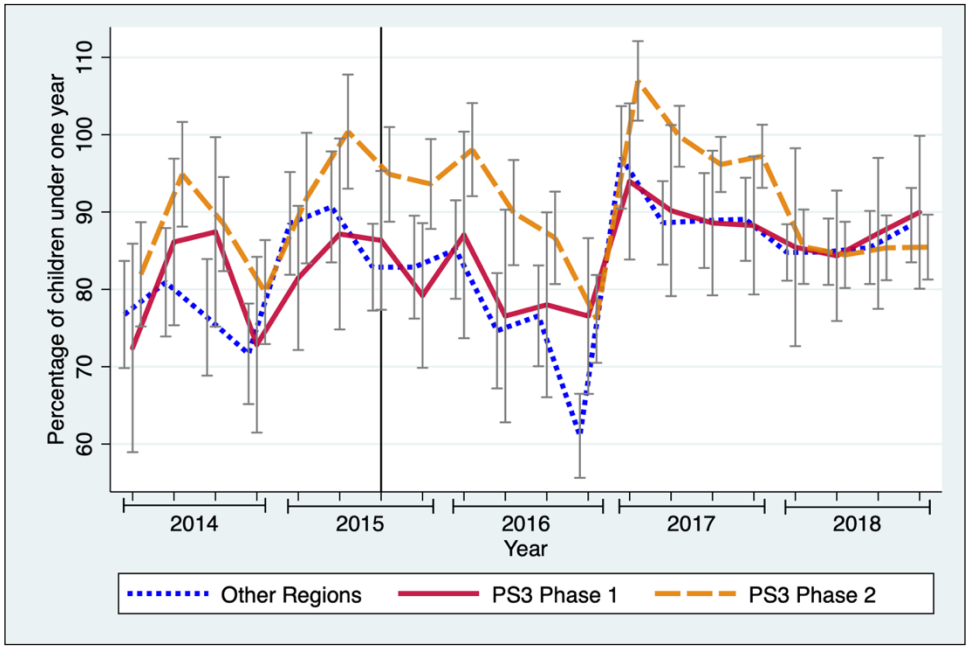


Figure B.12. Penta3 vaccination

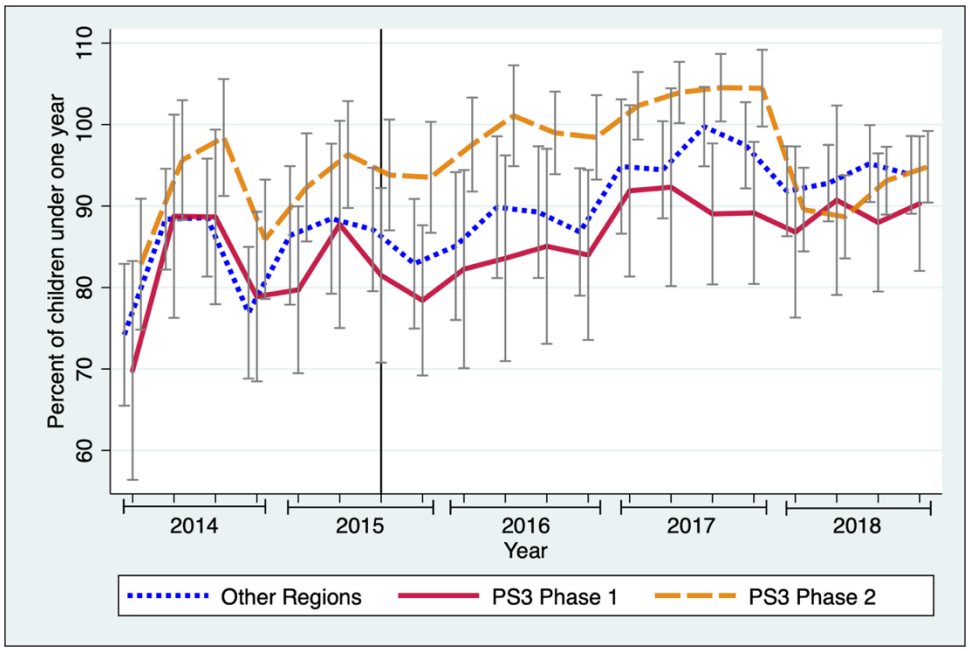


Figure B.13. ANC partners' HIV testing rate

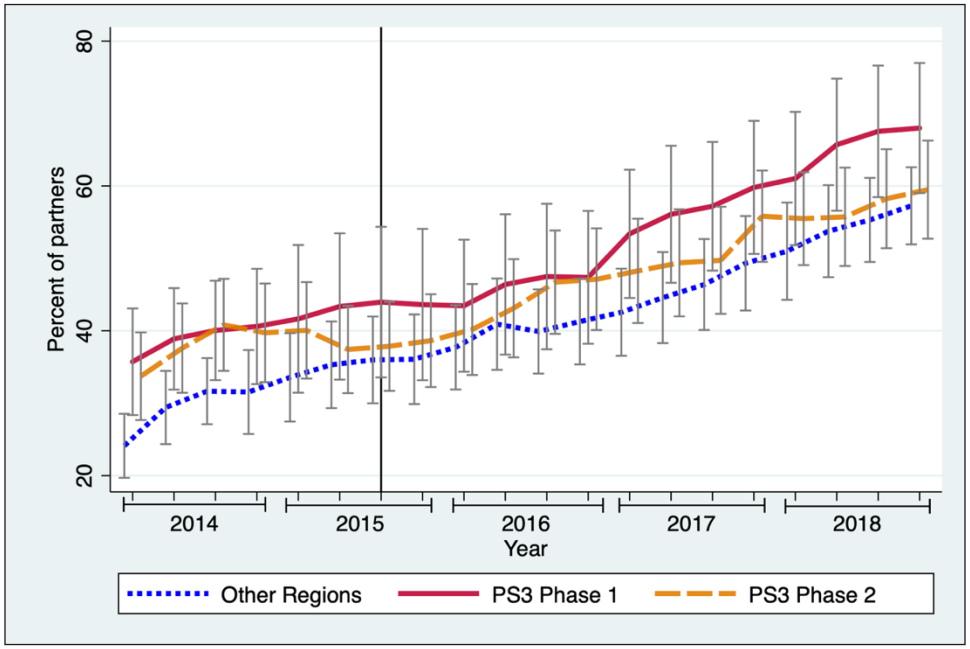


Figure B.14. Percentage of HIV-exposed infants receiving first HIV test within 2 months after birth

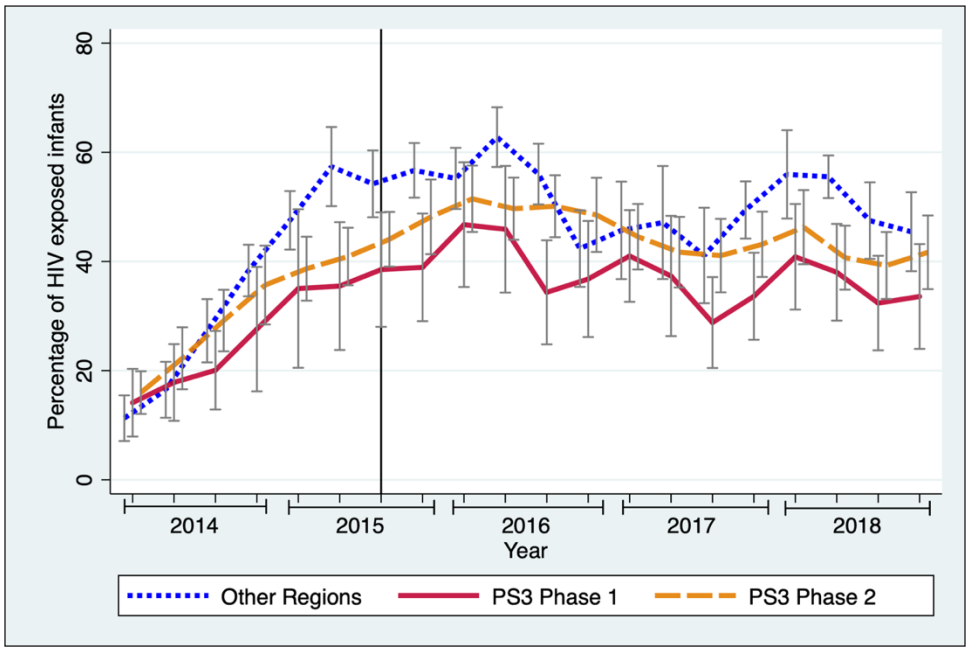


Figure B.15. Percentage of HIV-exposed infants initiated on cotrimoxazole within 2 months after birth

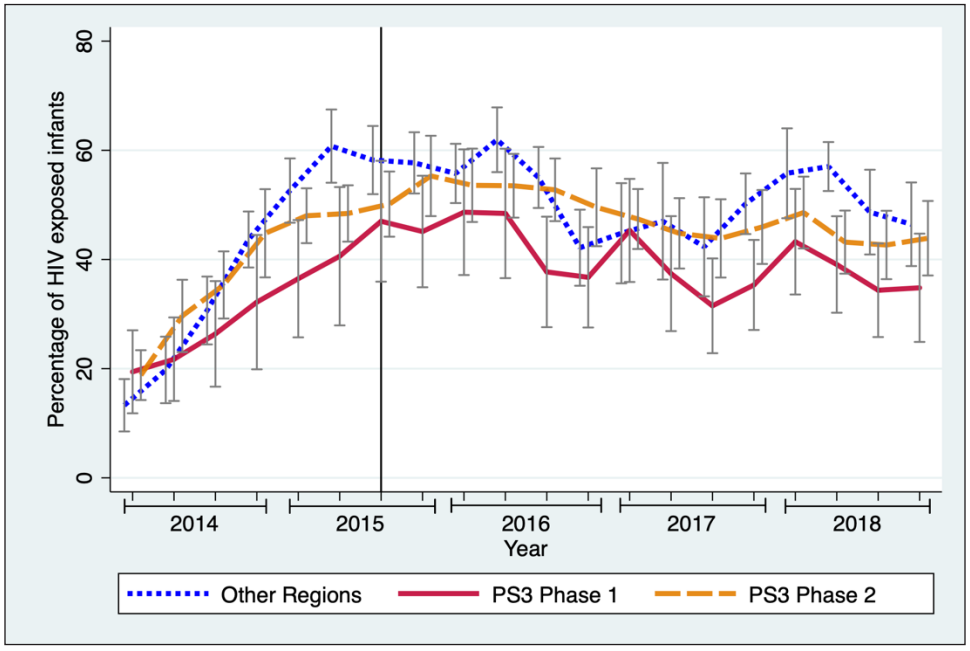


Figure B.16. Percentage of couples HIV counseling and testing at ANC

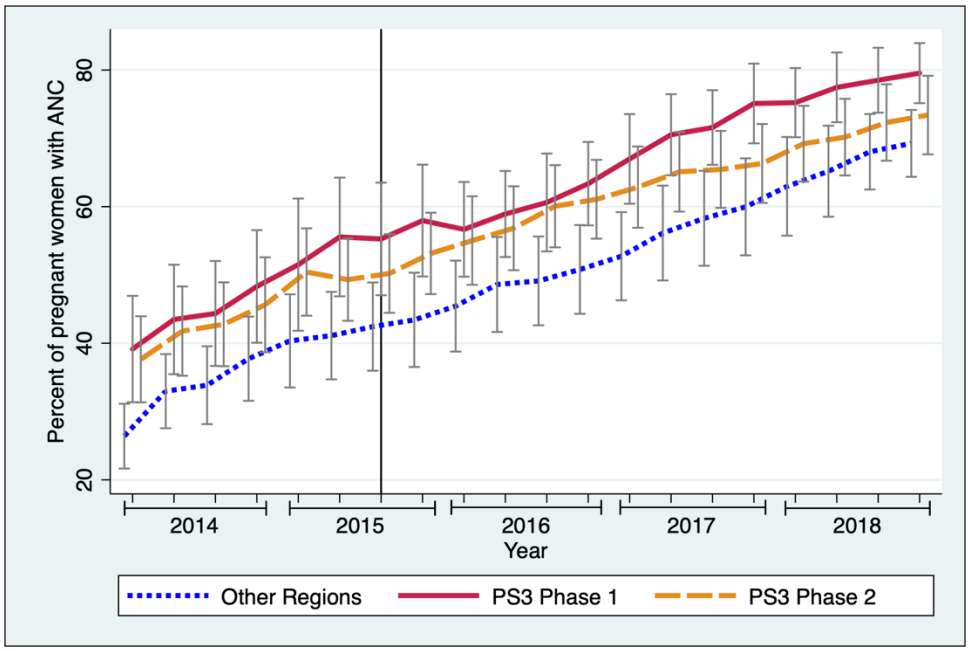


Figure B.17. Contraceptive prevalence rate

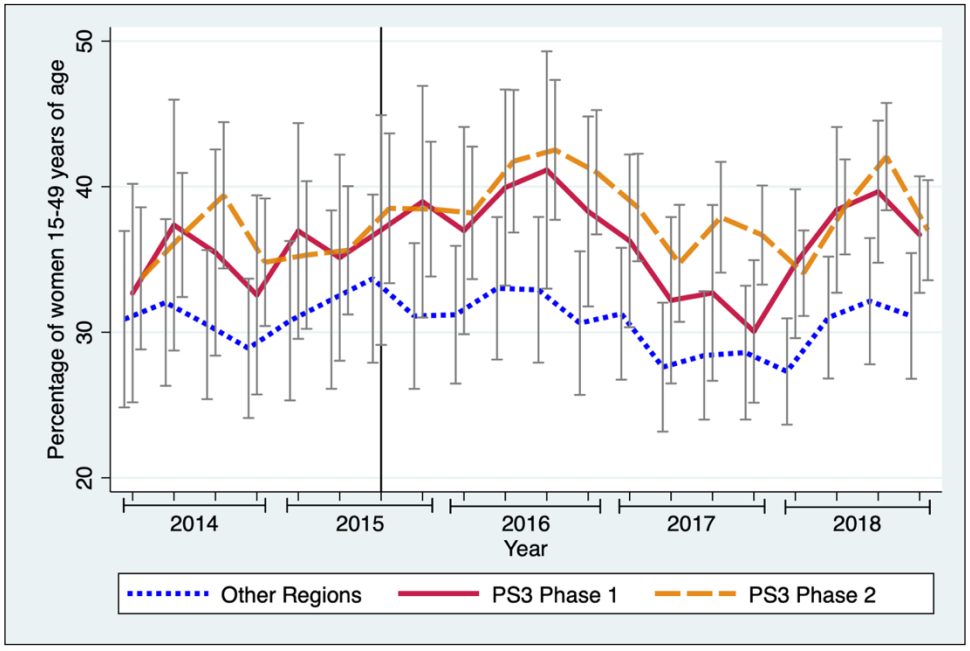


Figure B.18. Health facilities with RCH tracer drugs package

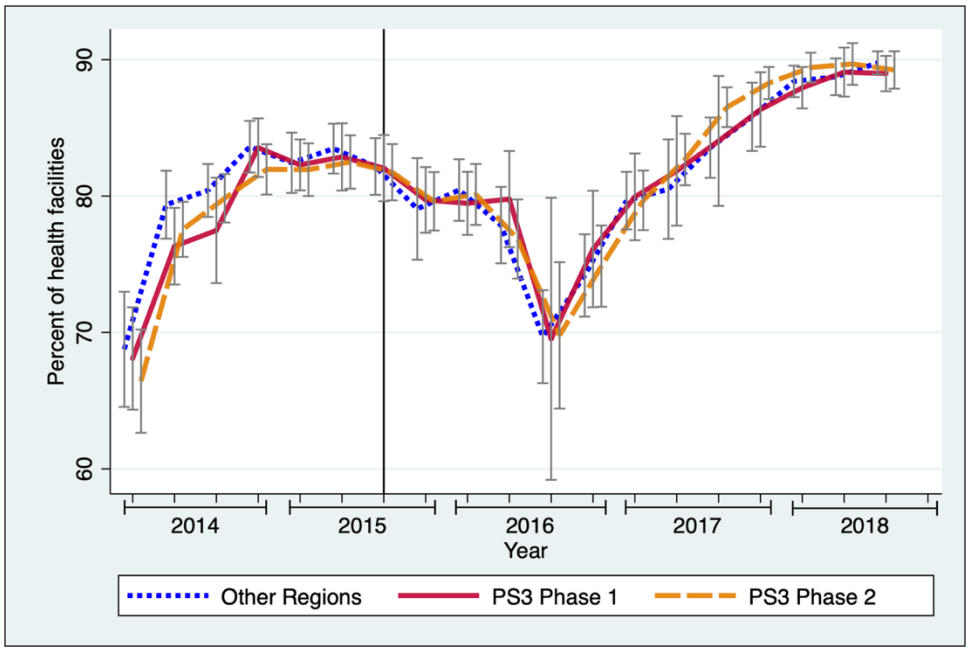


Figure B.19. PE per capita in health

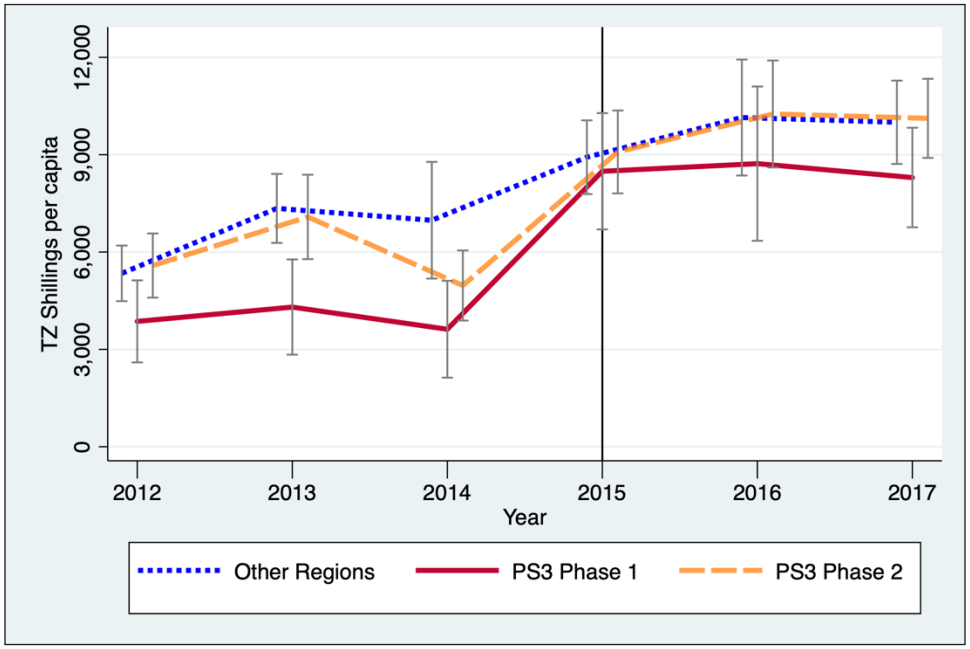


Figure B.20. PE per capita in education

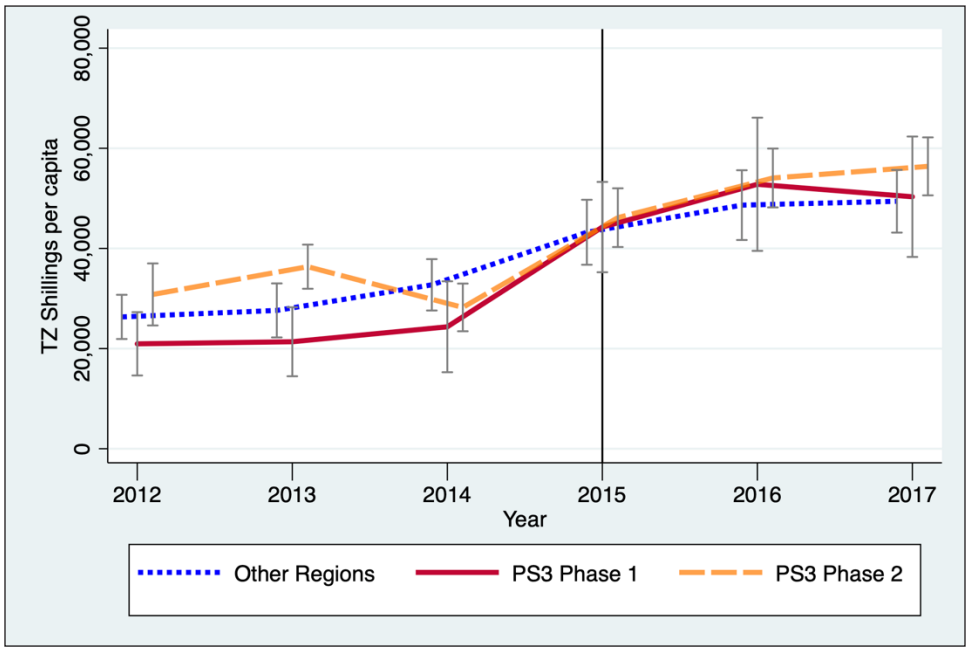


Figure B.21. OC per capita in health

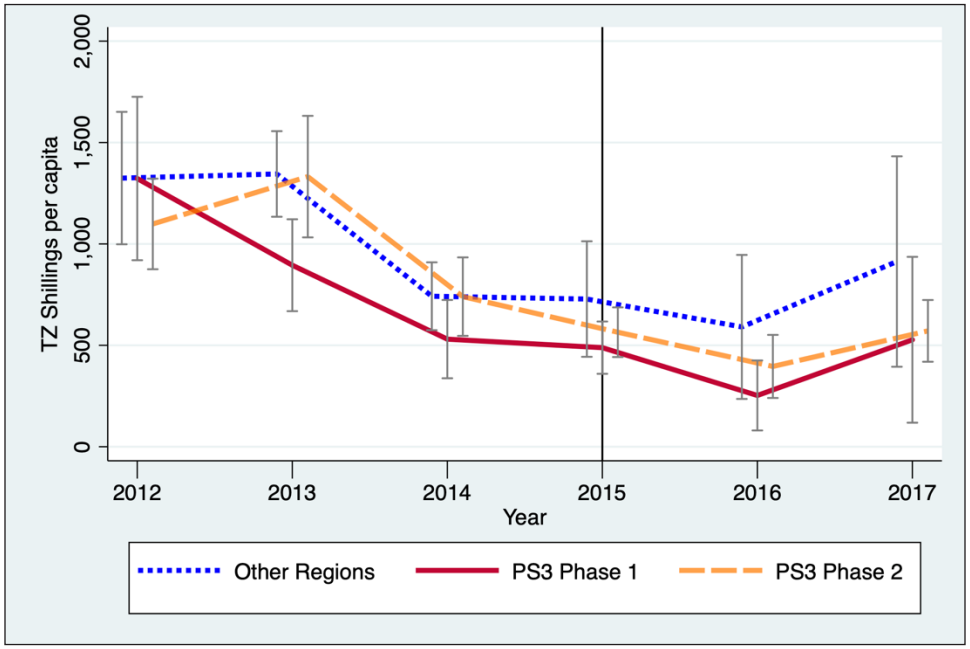


Figure B.22. OC per capita in education

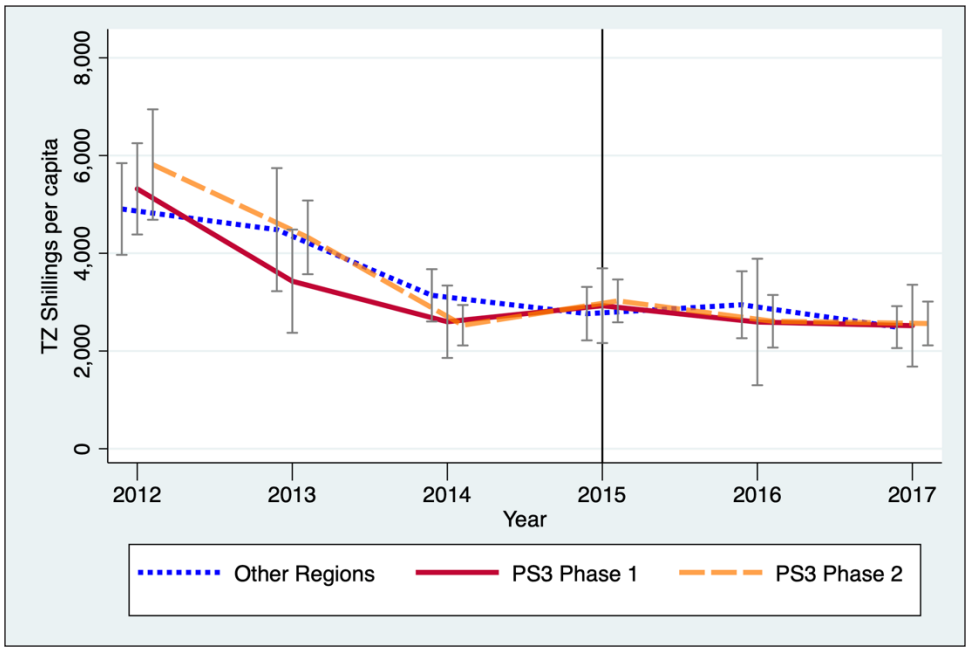


Figure B.23. Nurses per population, per 10,000 people

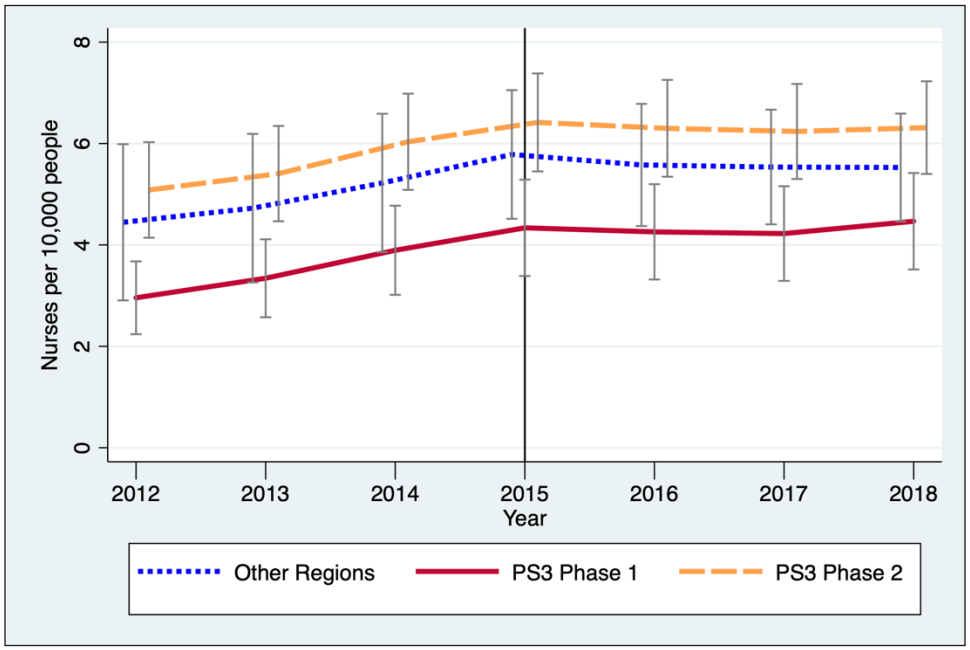


Figure B.24. Doctors per population, per 10,000 people

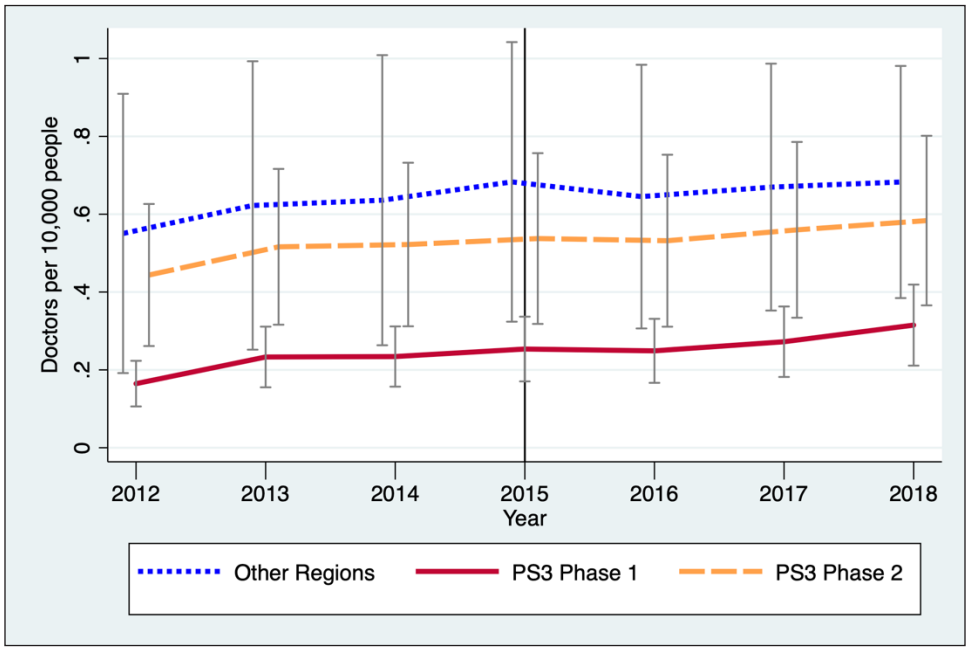


Figure B.25. Assistant medical officers per 10,000 people

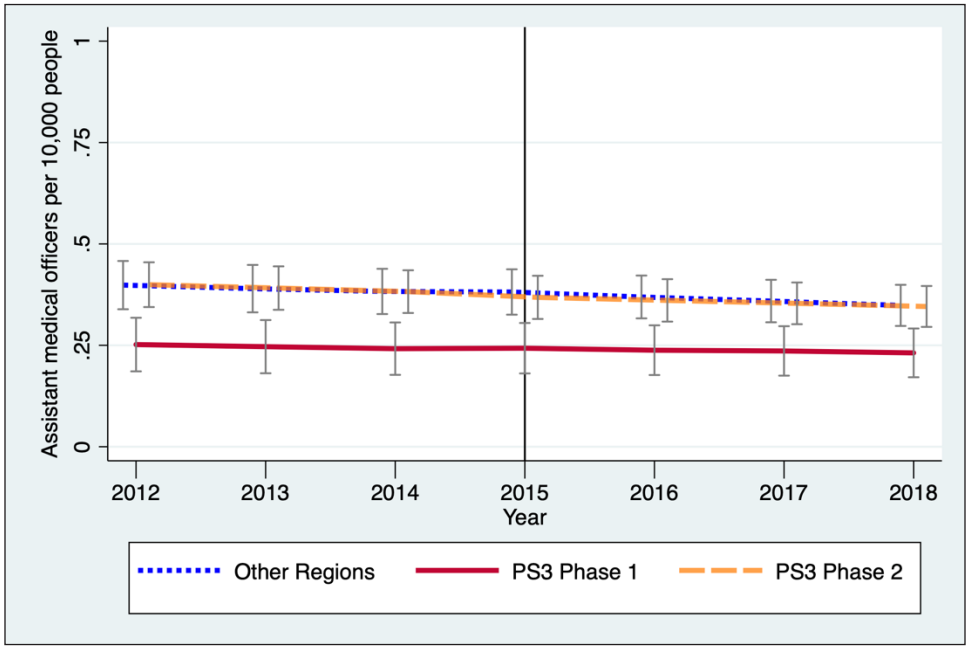


Figure B.26. Proportion of health care workers that are female

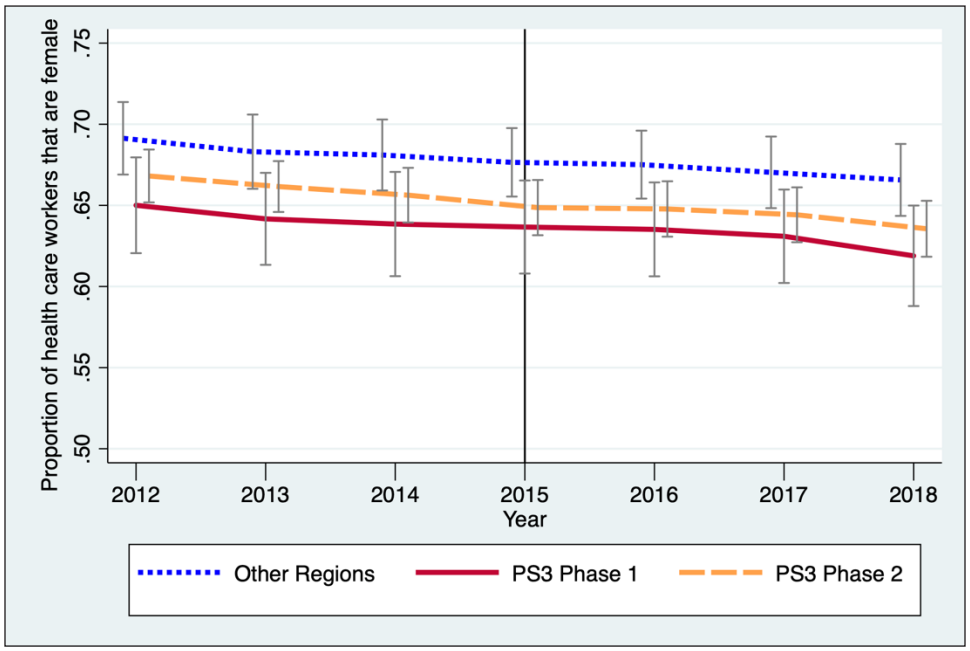


Figure B.27. Primary school student-teacher ratio

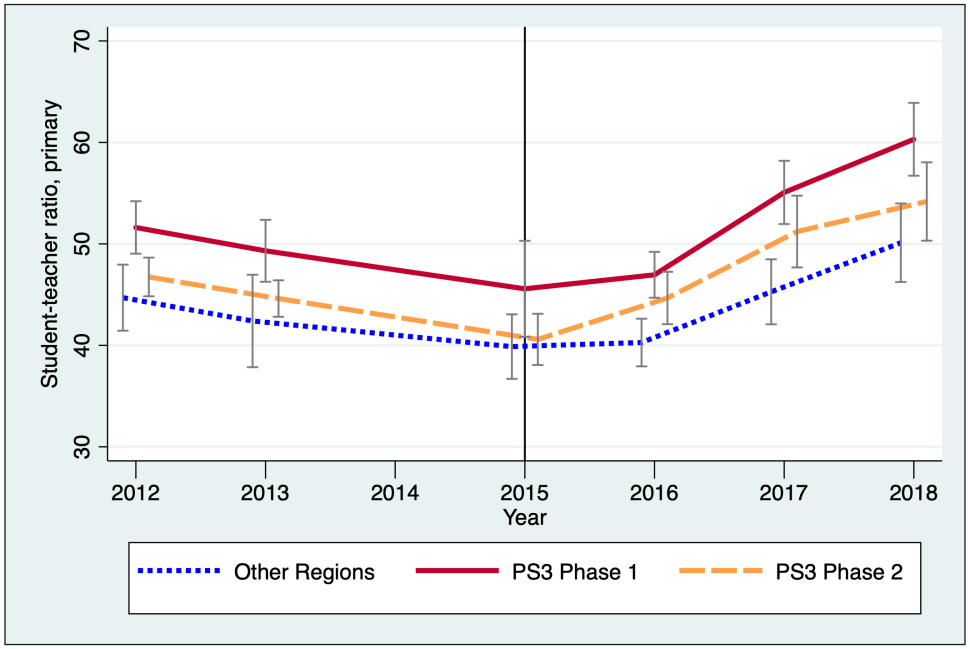


Figure B.28. Secondary school student-teacher ratio

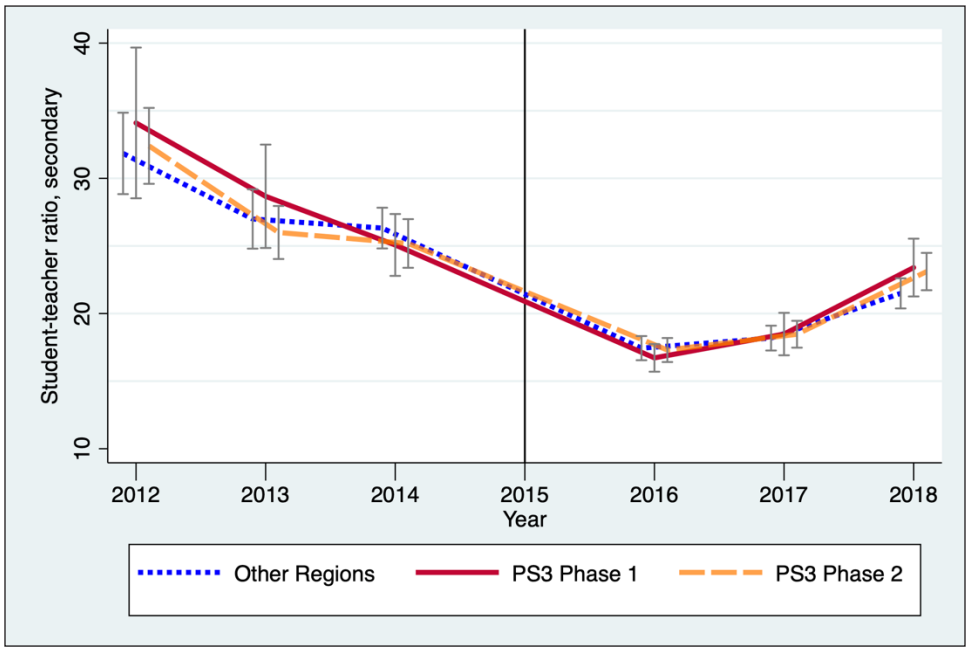


Figure B.29. Percentage of primary school students that are female

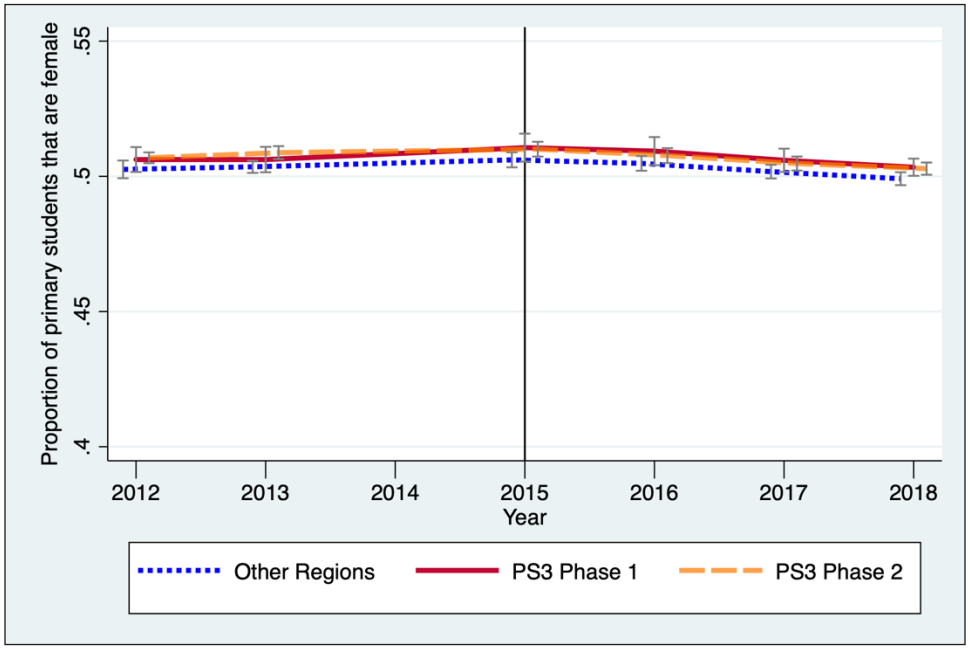


Figure B.30. Percentage of secondary school students that are female

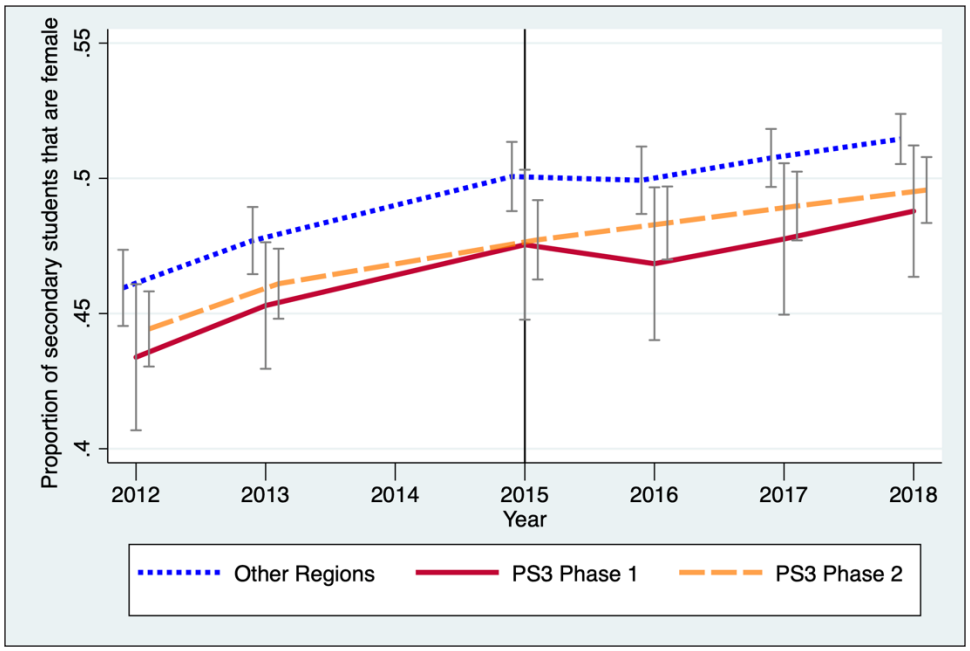


Figure B.31. Percentage of primary school teachers that are female

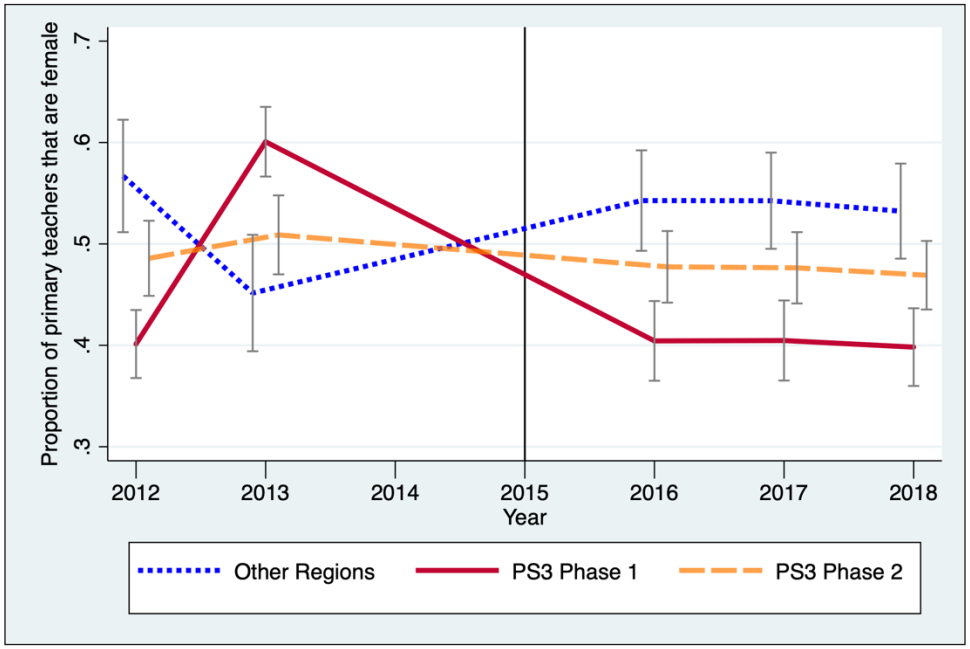
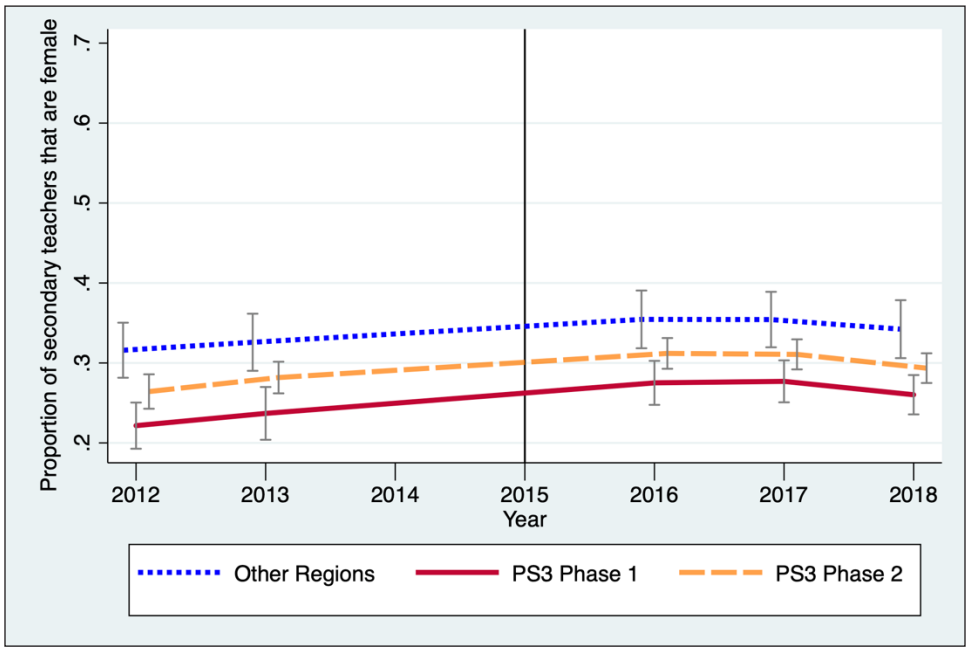


Figure B.32. Percentage of secondary school teachers that are female



APPENDIX C. INDICATOR DEFINITIONS

Table C.1. Selected health service utilization indicators for routinely collected data – PS3 evaluation

Indicator title	Indicator definition	Indicator calculation	Reporting frequency	Report data source	Date range available
Antenatal care (ANC) coverage before 12 weeks gestational age	Percentage of pregnant women who start ANC before 12 weeks of gestational age	N: Number of pregnant women who start ANC before 12 weeks of gestation age*100 D: Estimated number of pregnant women	Quarterly	DHIS2	Q1 2014 – Q4 2018
Pregnant women attending ANC 4+ times	Percentage of pregnant women who received antenatal care four or more times in a given time period.	N: Number of pregnant women who received antenatal care four or more times*100 D: Estimated number of pregnant women.	Quarterly	DHIS2	Q1 2014 – Q4 2018
Prevalence of pregnant women receiving iron and folic acid (IFA) supplementation for 90+ days	Percentage of pregnant women who received IFA for 90+ days	N: Number of pregnant women who received IFA supplementation for 90+ days for a certain period of time D: Total number of pregnant women during the same period	Quarterly	DHIS2	Q3 2013 – Q3 2018
Pregnant women receiving TT2+ at ANC	The percentage of women at the first ANC visit who received the TT2+ vaccine	N: Total number of ANC tetanus two 2+ doses*100 D: Total number of ANC first visit	Quarterly	DHIS2	Q1 2014 – Q4 2018
Women tested for anemia at ANC	The percentage of women at the first ANC visit who were tested for anemia	N: Total number of ANC hemoglobin tests done*100 D: Total number of ANC first visit	Quarterly	DHIS2	Q1 2014 – Q4 2018
Women tested for syphilis at ANC	The percentage of women at the first ANC visit who were tested for syphilis	N: Total number of ANC syphilis tests done*100 D: Total number of ANC first visit	Quarterly	DHIS2	Q1 2014 – Q4 2018
Deliveries taking place in health facilities	Percentage of deliveries taking place in health facilities	N: Number of deliveries taking place in health facilities during a given period D: Total number of live births /deliveries during a given period	Quarterly	DHIS2	Q3 2013 – Q3 2018

Indicator title	Indicator definition	Indicator calculation	Reporting frequency	Report data source	Date range available
Births assisted by skilled attendants**	Percentage of births assisted by skilled attendants	N: Number of births attended by skilled health personnel during a specified period D: Total number of live births during the specified period	Quarterly	DHIS2	Q1 2014 – Q4 2018
Mothers receiving postnatal care before 7 days	Percentages of mothers who received postnatal care within seven days of childbirth (regardless of place of delivery)	N: Number of mothers who received postnatal care within seven days of childbirth D: Total number of live births during the specified period	Quarterly	DHIS2	Q3 2013 – Q3 2018
Prevalence of low birth weight	Percentage of newborn registering less than 2.5 kg weight	N: Number of newborns registering less than 2.5 kg weight D: Number of all live births	Quarterly	DHIS2	Q3 2013 – Q4 2018
Measles vaccination coverage	Percentage of children under one year vaccinated against measles	N: Total number of children under one year vaccinated against measles*100 D: Total number of children under one year targeted in the period	Quarterly	DHIS2	Q1 2014 – Q4 2018
Penta3 vaccination coverage	Percentage of children under one received Penta3 vaccine in a given year or other period	N: Total number of children under one year vaccinated 3 times against DPT-Hb*100 D: Total number of children under one year targeted in the period	Quarterly	DHIS2	Q1 2014 – Q4 2018
ANC partners HIV testing rate	Percentage of partners of ANC clients tested for HIV during the first ANC visit	N: Number of ANC client partners tested for HIV during the first ANC visit D: Total number of first ANC visits	Quarterly	DHIS2	Q1 2014 – Q4 2018
HIV-exposed infants receiving first HIV test within 2 months after birth	Percentage of infants who were exposed to HIV and were tested within 2 months	N: Total number of HIV-exposed infants receiving first HIV test within 2 months after birth*100 D: Total number of women tested HIV positive	Quarterly	DHIS2	Q1 2014 – Q4 2018

Indicator title	Indicator definition	Indicator calculation	Reporting frequency	Report data source	Date range available
HIV-exposed infants initiated on cotrimoxazole within 2 months after birth	Percentage of infants who were exposed to HIV and started cotrimoxazole within 2 months	N: Total number of HIV-exposed infants initiated on cotrimoxazole within 2 months after birth*100 D: Total number of women tested HIV positive	Quarterly	DHIS2	Q1 2014 – Q4 2018
Couple HIV counseling and testing at ANC	Percentage of Couple HIV counseling and testing at ANC	N: Total number of ANC clients who received HIV testing and counselling as a couple during the first ANC visit D: Total number of first ANC visits	Quarterly	DHIS2	Q1 2014 – Q4 2018
Contraceptive prevalence rate**	The percentage of women aged 15-49 years, regardless of marital status, who have received at least one modern method of contraception from a health facility during the year, regardless of the method used	N: Number of women 15-49 years of age who are currently using a modern contraceptive method*100 D: Number of women between 15 and 49 years of age in the catchment area	Quarterly	DHIS2	Q1 2014 – Q4 2018
Health facilities with RCH tracer drugs package	Percentage of health facilities with RCHs tracer drugs package	N: Total number of health facilities with RCHs tracer drugs package D: Total number of health facilities	Quarterly	DHIS2	Q1 2014 – Q3 2018
Personal Emoluments (PE) per capita in health	The total amount spent on health personnel salaries per person in the population	N: Gross salary in TZ Shillings received by all health sector civil servants in the LGA D: The number of people living in the LGAs	Yearly	CFR	2012–2017
PE per capita in education	The total amount spent on education personnel salaries per person in the population	N: Gross salary in TZ Shillings received by all education sector civil servants in the LGA D: The number of people living in the LGA	Yearly	CFR	2012–2017

Indicator title	Indicator definition	Indicator calculation	Reporting frequency	Report data source	Date range available
Other charges (OC) per capita in health	The total amount of other health sector-related expenditures per person in the population	N: Total funding in TZ Shillings for other charges flowing through LGA bank accounts for health D: The number of people living in the LGA	Yearly	CFR	2012–2017
OC per capita in education	The total amount of other education sector-related expenditures per person in the population	N: Total funding in TZ Shillings for other charges flowing through LGA bank accounts for education D: The number of people living in the LGA	Yearly	CFR	2012–2017
Nurses per 10,000 people	The number of nurses per 10,000 people in the population	N: The number of nurses in the LGA*10,000 D: The number of people living in the LGA	Yearly	HRHIS	2012–2018
Doctors per 10,000 people	The number of doctors per 10,000 people in the population	N: The number of doctors in the LGA*10,000 D: The number of people living in the LGA	Yearly	HRHIS	2012–2018
Assistant medical officers per 10,000 people	The number of AMOs per 10,000 people in the population	N: The number of AMOs in the LGA*10,000 D: The number of people living in the LGA	Yearly	HRHIS	2012–2018
Health care workers that are female	The percentage of health care workers that are female	N: number of health care workers that are female in the LGA*100 D: Total number of health care workers in the LGA	Yearly	HRHIS	2012–2018
Primary school student-teacher ratio	The ratio of the number of primary school students to the number of primary teachers	N: Number of students enrolled in primary school D: The number of primary school teachers	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018

Indicator title	Indicator definition	Indicator calculation	Reporting frequency	Report data source	Date range available
Secondary school student-teacher ratio	The ratio of the number of secondary school students enrolled to the number of secondary teachers	N: Number of students enrolled in secondary school D: The number of secondary school teachers	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018
Primary school students that are female	The percentage of students enrolled in primary school that are female	N: The number of female, primary school students*100 D: The total number of students enrolled in primary school	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018
Secondary school students that are female	The percentage of students enrolled in secondary school that are female	N: The number of female, secondary school students*100 D: The total number of students enrolled in secondary school	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018
Primary school teachers that are female	The percentage of primary school teachers that are female	N: The number of female primary school teachers*100 D: The total number of primary school teachers	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018
Secondary school teachers that are female	The percentage of secondary school teachers that are female	N: The number of female, secondary school teachers*100 D: The total number of secondary school teachers	Yearly	MOE BEST	2012–2013
				NBS OPENDATA	2014–2015
				PO-RALG BEST	2016–2018

APPENDIX D. DATA SOURCES

Service Utilization Data Sources

DHIS2/HMIS

DHIS2 is a health data management tool. Data entry is done for a list of data elements or in customized, user-defined forms that are developed to mimic paper-based data capture forms. The major data source for DHIS2 is the routine aggregate data that health facilities collect using HMIS paper-based forms, which are then entered into the system at the district level and used to generate routine reports and indicators at the district, regional, and national levels. The data entry module is where data are manually registered in the DHIS2 database. Data are registered for a single organizational unit (a health facility), period, and set of data elements (dataset) at a time. A dataset often corresponds to a paper-based HMIS reporting form.

Strengths

DHIS2 can also be used to increase or enhance data quality at multiple points in time:

1. At the point of data entry: Checks can be made to ensure that data fall within acceptable minimum and maximum values for any given data element. Such checks help identify typing errors at the time of data entry.
2. After data entry: Users can define validation rules, which can be compared against the data that have been entered to identify any validation rule violations. If there are any violations, staff responsible for entering data can determine if any actions need to be taken. These types of checks help to ensure that data entered in the system are of good quality.

Limitations

There are concerns about the quality of data collected in terms of completeness, accuracy, and timeliness. The data quality problem is exacerbated by the data collection burden placed on health care workers for transcribing data, as well as tallying and reporting data into the HMIS. With up to 16 registers and other reporting forms in use, some of which collect duplicative data, frontline health care workers face enormous data management challenges. There are also challenges with denominators for calculating various indicators. DHIS2 uses the health facility as the lowest organizational unit for generating indicators. Denominators for calculating health facility-level indicators are derived from census and population projections. The denominators may not be accurate.

Indicators

- ANC coverage before 12 weeks gestational age
- Pregnant women attending ANC 4+ times
- Prevalence of pregnant women receiving iron and folic acid (IFA) supplementation for 90+ days
- Pregnant women receiving TT2+ at ANC
- Women tested for anemia at ANC
- Women tested for syphilis at ANC
- Deliveries taking place in health facilities
- Births assisted by skilled attendants
- Mothers receiving postnatal care before 7 days
- Prevalence of low birth weight
- Measles vaccination coverage
- Penta3 vaccination coverage
- ANC partners' HIV testing rate
- HIV-exposed infants receiving first HIV test within 2 months after birth
- HIV-exposed infants initiated on cotrimoxazole within 2 months after birth
- Couples HIV counseling and testing at ANC
- Contraceptive prevalence rate
- Health facilities with RCH tracer drugs package

Financial Data Sources

Council Financial Reports (CFRs)

CFRs provide and report LGAs' finance information relating to own source revenue (OSR), cashbook balance, transfers and loans/borrowing and expenditures, both in summary and details, in a specially designed Excel template with each type of information completed on its sheet. The process of preparing CFRs by LGAs started in 2008/2009. For this particular evaluation, CFR data for all LGAs for six ears from 2012/2013 to 2017/2018 are involved.

An Excel template is completed by the LGA and then submitted to the Regional Secretariat (RS) on a quarterly basis (within 15 days after the respective quarter's end). At the RS level, individual LGA CFRs within the region are compiled and consolidated to produce a regionally consolidated LGA CFR. After completion of the compilation and consolidation by the RS, normally within two weeks, the regionally consolidated LGA CFRs are submitted to PO-RALG at the Directorate of Local Government, Local Government Finance Section for compilation and consolidation at the national level, and hence nationally consolidated LGA CFRs.

Access to nationally consolidated LGA CFRs was granted by the Permanent Secretary—PO-RALG—and the evaluation team representative worked with three government staff members to clean, extract, and compile data from CFRs. The staff were appointed by the Assistant Director – Local Government Finance; i.e., one finance management officer, responsible for CFR at PO-RALG HQ and two finance management officers from Mtwara and Coast Regional Secretariats.

CFRs are the main source of LGA information relating to finance, which is used for various purposes, inter alia, monitoring, control, and evaluation, and providing information on own-source revenue collection, transfers, and expenditures. The main users of CFRs are LGAs, RSs, PO-RALG, the Ministry of Finance and Planning (MOFP), and other sectoral ministries. Other users include development partners (DPs) who collaborate with the government on various matters relating to LGAs as well as particular interests on local government finance issues.

Limitations

- Several errors and mistakes in some data entered in the "CFR Excel template," especially at the early years (3–4 years), caused by manual system for preparation of CFRs as well as high advanced Excel template, thus requiring training to key users. However, the situation improved continuously from year to year.

This limitation has, however, been solved through PS3 support and beginning 2018/2019 the CFR preparation process became automated and CFRs are now produced automatically through the PlanRep System.

Indicators

- Personal emoluments (PE) per capita in health
- PE per capita in education
- Other charges (OC) per capita in health
- OC per capita in education

Human Resource Data Sources

Human Resource for Health Information System (HRHIS)

Managed by MOHCDGEC

A software for collection, collation, and storage of HR for health information. In 2009, the MOH consulted with the University of Dar es Salaam to develop the software which tracks human resources for health information in the health sector. The system is being used by health secretaries at the district level for the day to day tasks of recording and reporting HR in the health sector. HRHIS has currently been rolled-out across Tanzania—it is fully operational and used in all district hospitals, regional hospitals, and referral hospitals in

Tanzania, as well as health training institutions and ministry departments. Data from lower facilities is entered at the district level in the case of dispensaries and health centers.

Records Management

The system uses a records management module to control the collection of HR information such as personnel particulars, in-service trainings, and employees' histories. In the data management module several forms are available for data entry depending on the type of employee. These include:

1. Training institution employee form
2. Public employee form
3. Private employee form
4. Referral hospital employee form

Limitations

- Delays in entering new employee records
- Delays in updating the history of employees
- Exit date (day) of employee not recorded

Indicators

- Nurses per 10,000 people
- Doctors per 10,000 people
- Assistant medical officers per 10,000 people
- Health care workers that are female

Education Data Sources

Basic Education Statistics in Tanzania (BEST)

Managed by MOEST; data for 2012–2013

Between 2012 and 2013 education statistics were commissioned to different consultants in various parts of the country who had the responsibility of gathering education information and submitting the same to the ministry of education for publishing. Data were collected, in paper form, from primary and secondary schools, and other education institutions.

Limitations

No raw data was found at the MOE, only limited secondary data that has been published was available.

Due to different consultants, the quality of the data depended on the vigor exhibited by the consultant and therefore the data lacked uniformity in quality. The majority of data were at the regional level.

Indicators

- Primary school student-teacher ratio
- Secondary school student-teacher ratio
- Primary school students that are female
- Secondary school students that are female
- Primary school teachers that are female
- Secondary school teachers that are female

OPENDATA

Managed by the National Bureau of Statistics; data for 2014–2015

This is an online basic statistics portal which contains data for different sectors, including education. For the case of HR for education, OPENDATA gathers datasets from different institutions under the education sector. The Basic Statistics Portal is managed by the Basic Statistics working group, comprising the National Bureau of Statistics.

Limitations

There is no specific period for updating the portal, and the data have significant gaps.

Indicators

- Primary school student-teacher ratio
- Secondary school student-teacher ratio
- Primary school students that are female
- Secondary school students that are female
- Primary school teachers that are female
- Secondary school teachers that are female

Basic Education Statistics in Tanzania (BEST)

Managed by PO-RALG; data for 2016, 2017, and 2018

Data was retrieved from institutions under the jurisdiction of MOEST and PO-RALG. These include: pre-primary, primary, secondary, teacher education, adult and non-formal education, as well as technical, vocational, and higher education institutions. Data is collected through annual census of these institutions using questionnaires. Filled-in questionnaires/forms are returned to the councils for data entry and processing. Data from technical, vocational, and higher institutions is collected directly by the Ministry. Population data is obtained from NBS, while examination data is obtained from the National Examination Council of Tanzania (NECTA).

Frequency of Data Collection

Data from higher education, technical, and vocational training institutions must be submitted by 15 February each year.

Indicators

- Primary school student-teacher ratio
- Secondary school student-teacher ratio
- Primary school students that are female
- Secondary school students that are female
- Primary school teachers that are female
- Secondary school teachers that are female

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