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DELIVERING AN AIDS-FREE GENERATION: EXTENDING THE PROVISION OF INTEGRATED ANC/PMTCT B+ SERVICES VIA PRIVATE NURSES AND MIDWIVES IN TANZANIA

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ACRONYMS

3TC	Lamivudine (antiretroviral drug)
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
CD4	Cluster of Differentiation 4
CMO	Chief Medical Officer
CNO	Chief Nursing Officer
CTC	Care and Treatment Center
DBS	Dried Blood Spot
DHMT	District Health Management Team
DMO	District Medical Officers
DNA-PCR	Deoxyribonucleic Acid-Polymerase Chain Reaction
EFV	Efavirenz (antiretroviral drug)
EID	Early Infant Diagnosis
EMTCT	Elimination of Mother-to-Child Transmission
FACGBF	The “Flora, Albert, Cyril, Gloria, Beata, and Fred” PRINMAT Clinic
FGD	Focus Group Discussion
HMIS	Health Management Information System
HTC	HIV Testing and Counseling
L&D	Labor and Delivery
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MOHSW	Ministry of Health and Social Welfare
MTCT	Mother-to-Child Transmission
MTUHA	Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya
NVP	Nevirapine (antiretroviral drug)
NIMART	Nurse-Initiated and Managed Antiretroviral Therapy
PHC	Primary Health Care
PMTCT	Prevention of Mother-to-Child Transmission
PRINMAT	Private Nurses and Midwives Association of Tanzania
PPP	Public-Private Partnership
PSA	Private Health Sector Assessment
RCH	Reproductive and Child Health
RDT	Rapid Diagnostic Test
SHOPS	Strengthening Health Outcomes through the Private Sector
TDF	Tenofovir (antiretroviral drug)
TNMC	Tanzania Nursing and Midwifery Council

TWG	Technical Working Group
UNAIDS	Joint United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

Although HIV remains one of the leading causes of death among women of reproductive age and infants worldwide, there is growing optimism that a global AIDS-free generation can be realized. The prevention of mother-to-child transmission of HIV (PMTCT) is a key element of combination HIV prevention efforts aimed at achieving this goal. Antiretroviral (ARV) prophylaxis or long-term antiretroviral therapy (ART), coupled with effective counselling and support, has been clinically proven to effectively safeguard against vertical transmission of the virus between an HIV-positive pregnant or breastfeeding mother and her newborn. Effective PMTCT interventions can reduce the risk of mother-to-child transmission (MTCT) to less than 5 percent, with PMTCT services also serving as an important gateway to family focused HIV prevention, treatment, and care (World Health Organization 2015b; AIDSTAR-One n.d.).

The expansion of PMTCT and ART eligibility criteria under World Health Organization (WHO) Option B+ has provided the opportunity to initiate more pregnant women on ART earlier and at the time of diagnosis. While this holds tremendous promise to prevent new HIV infections among newborns and to save the lives of mothers, it also poses significant operational, programmatic, and technical challenges to health leaders and implementers in many resource-poor countries (World Health Organization 2013). For instance, the severe shortages of health care workers in many countries around the world has been identified as a critical constraint to achieving public health and development goals, such as the extension of PMTCT services (Rakibul Hasan 2007). These human resource shortages, as well as inadequate ARV and commodity supply, limited infrastructure, and health financing deficits have all constrained further extension of PMTCT coverage in many high-HIV burden and resource-constrained settings.

PMTCT IN TANZANIA

The United Republic of Tanzania, a democratic country in East Africa with a population of approximately 49.6 million people (CIA World Factbook 2014), has been significantly impacted by the HIV epidemic, particularly among the approximate 70 percent of the total population who live in rural or hard-to-reach areas (World Bank 2015). HIV prevalence is estimated at approximately 5.1 percent (UNAIDS 2014b), translating to 1.4 million Tanzanians living with HIV and AIDS. An estimated 119,000 HIV-positive pregnant women give birth annually in Tanzania, and although PMTCT coverage has significantly improved since the emergence of the epidemic, as of 2013 only 70 percent of HIV-positive pregnant women and 56 percent of HIV-exposed newborns and infants were receiving necessary PMTCT interventions (Tanzania Ministry of Health and Social Welfare n.d.). Currently, Tanzania's MTCT rate remains at approximately 15 percent, with nearly 18 percent of under-five child mortality attributed to AIDS-related causes (Tanzania Ministry of Health and Social Welfare n.d.).

In seeking to address persisting challenges that are restricting the extension of national PMTCT services, the Government of Tanzania and Ministry of Health and Social Welfare (MOHSW) are currently implementing two PMTCT-related strategic plans, the Tanzania Elimination of Mother to Child Transmission of HIV (EMTCT) Plan (2012-2015), and a guiding document, the National Road Map Strategic Plan to Accelerate Reduction of Maternal, Newborn, and Child Deaths in Tanzania (2008-2015). Both plans seek to rapidly scale up the availability of essential maternal and child health (MCH) services, in particular, by pursuing the integration of PMTCT and ART

into existing antenatal care (ANC) and maternal health services in order to prevent new infections among newborns and to protect the health of HIV-positive mothers long term.

The United States Agency for International Development's Strengthening Health Outcomes through the Private Sector (SHOPS) project implemented an innovative service delivery intervention focused on rapid scale-up of PMTCT via Tanzania's private health sector. The intervention targeted the three priority elements outlined in the MOHSW's national EMTCT plan: addressing severe human resource shortages in the health sector, promoting public-private partnership (PPP) and engaging the private health sector, and scaling up an integrated community-based ANC and PMTCT B+ service package.¹ To address these diverse priorities, the SHOPS project implemented an intervention that emphasized engagement with Tanzanian partners at both the policy level and in community-based practice. The overall goal of the SHOPS intervention was to stimulate rapid scale-up of integrated ANC and PMTCT B+ services delivered via private nurses and midwives in underserved and high need community-based settings in Tanzania.

SHOPS INTERVENTION METHODOLOGY

The first component of the dual-pronged policy to practice approach implemented by SHOPS was a policy intervention focused on developing a PPP to advance HIV task-sharing among Tanzania's public and private nurses and midwives. A SHOPS-led private sector assessment previously carried out in Tanzania revealed that many public sector nurses and midwives were delivering some portion of services along the PMTCT B+ cascade of care, and that at least some private nurses and midwives were delivering HIV testing and counselling (HTC) and PMTCT services to pregnant women. However, nurse and midwife involvement in PMTCT and other HIV tasks were not explicitly defined or protected in a formal Scope of Practice.² In order to fill this policy gap, SHOPS partnered with the office of the Chief Nursing Officer (CNO) and the Tanzania Nursing and Midwifery Council (TNMC) to develop Tanzania's first scope of practice for nurses and midwives. This scope of practice was necessary to create an enabling environment and improve utilization of nurse and midwife professional cadres, and protect them in their delivery of PMTCT B+ and other ART-focused services.

In collaboration with the CNO, the TNMC, Tanzania's nursing and midwifery leadership, numerous disease specialists, and national medical and pharmacy leadership, SHOPS assembled a large group of Tanzanian nursing and midwifery stakeholders to draft and validate the country's first-ever scope of practice for nurses and midwives. In addition to extensions of responsibility, the scope of practice formally enabled task-sharing of PMTCT B+ service provision to nursing and midwifery cadres at certificate level and above, and prescribing authority for adult ART to nurses and midwives at diploma level and above. It also promoted PPP and multi-sectoral collaboration. The scope of practice was launched in parallel to the SHOPS PMTCT B+ service delivery intervention, and paved the way for additional SHOPS activities focused on advancing nurse-initiated and -managed ART (NIMART).

The second component of the SHOPS intervention focused on scaling up practical implementation of PMTCT B+ services via private nurses and midwives in underserved community-based settings in Tanzania. The Private Nurses and Midwives Association of Tanzania (PRINMAT)—a professional association and service delivery network of private health

¹ PMTCT B+ refers to the WHO's option to initiate HIV-positive pregnant women on lifelong ART at the time of diagnosis irrespective of cluster of differentiation 4 (CD4) count.

² In nursing, "Scope of Practice" typically refers to the legal, professional, and clinical parameters of care, as well as the full range of roles and responsibilities, that nurses are educated, competent, and authorized to perform (White et al. 2008).

care workers dedicated to improving health outcomes among underserved mothers and children in Tanzania—was identified as a strong local partner organization that could achieve rapid scale-up and targeted delivery of integrated ANC and PMTCT B+ services at the community level. PRINMAT’s national secretariat supports 78 nurse- and midwife-owned and operated health facilities that provide a broad spectrum of ANC and MCH services, as well as serving as key sources of public health promotion and information via community-based outreach. PRINMAT-affiliated facilities primarily serve a clientele of women and girls, with nearly all facilities providing family planning, ANC, labor and delivery, and MCH services as part of their core service package. In addition, PRINMAT facilities have been recognized as important health access points in poor and underserved urban, peri-urban, and rural communities throughout Tanzania.

The SHOPS PMTCT B+ service delivery intervention engaged the PRINMAT network of ANC and maternity facilities in order to scale up their involvement in the delivery of an integrated ANC/PMTCT B+ service package in high need community-based settings. This intervention was accomplished through a PPP involving PRINMAT, the MOHSW PMTCT Section, and the MOHSW PPP-technical working group.

The PMTCT B+ service delivery intervention was implemented in a phased approach to prepare the PRINMAT providers and their facilities to introduce PMTCT B+ services, to utilize service data to guide implementation and scale-up, and to promote sustainability via strong public-private collaboration. SHOPS identified 73 individual nurses and midwives to participate in the PMTCT B+ intervention, a group representing 53 separate PRINMAT-affiliated facilities. The providers and facilities were selected to prioritize facilities and locations serving vulnerable populations, including the urban poor and rural underserved communities.

Pre-implementation focus group discussions (FGDs) with the selected providers assessed their existing service delivery capacity and their perceived demand for PMTCT B+ within their existing ANC caseloads and the surrounding community. At baseline, very few providers had received any supplemental training or skills development in HIV service delivery. Only 18 percent had received formal training on HTC, less than 4 percent on PMTCT, and none had received training on the provision of ART. Perceived demand for PMTCT services among existing PRINMAT clients was high, with providers stating that their ability to provide PMTCT B+ would strengthen the continuum of care for pregnant clients from presentation at ANC through safe delivery and retention on ART.

In February and early March 2014, SHOPS supported two PMTCT B+ clinical trainings, one in Dar es Salaam and one in Mwanza region, which certified 75 PRINMAT providers to deliver PMTCT B+ services in 53 separate PRINMAT facilities across the country. The training included both classroom-based theoretical learning and facility-based clinical skills development related to the PMTCT B+ treatment cascade. In addition to the clinical training, SHOPS supported a supplemental training focused on PRINMAT data collection and reporting to the national MTUHA³ health information and data management system.

Following the SHOPS-sponsored private provider trainings, SHOPS and PRINMAT collaborated to prepare the 53 facilities for PMTCT B+ service introduction, including providing data management and health information registers, and equipping the facilities with PMTCT commodities—including HIV rapid diagnostic tests, dried blood spot (DBS) specimen collection kits, and ARVs. PRINMAT providers were enabled by the national MOHSW PMTCT section to present their PMTCT B+ training certificates to their respective District Medical Officers (DMOs)

³ Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya (MTUHA) is the governments’ health information management system

in order to procure commodities for HTC and PMTCT B+. Most DMOs and/or district pharmacists provided public buffer stock quickly, or at minimum included the PRINMAT facility on the next three-month HIV commodity procurement forecast.

Following the completion of provider and facility preparations, SHOPS monitored and collected service data from the participating PRINMAT facilities for a total monitoring period of nine months, from June 1, 2014, through the end of February 2015. Data from the implementation period were combined to evaluate final service delivery statistics and PMTCT outcomes, and were compared to baseline data to reveal pre- and post-implementation changes. A second FGD was conducted following the completion of the formal implementation period (March 2015) to learn about the providers' experiences and perspectives after introducing and delivering PMTCT B+ services. These implementation experiences and the final quantitative service data were used to inform and guide SHOPS continued PMTCT and ART activities in Tanzania. This included a third SHOPS-sponsored PMTCT B+ training of 35 additional PRINMAT providers in March 2015 to extend PMTCT B+ services to the additional 22 facilities in the PRINMAT network, ensuring that all PRINMAT facilities were equipped to deliver PMTCT B+ services.

OUTCOMES AND FINDINGS

PRINMAT facilities participating in the SHOPS intervention delivered ANC services in 18 of Tanzania's 30 regions. The facilities reported an average nine-fold increase in monthly HTC services, rising from a combined monthly average of 227 HTC services, to 2,105 HTC services provided per month. In total, the PRINMAT PMTCT facilities provided 18,942 individual HTC services during the nine-month monitoring period.

Following the introduction of PMTCT B+ at the 53 PRINMAT facilities, a total of 536 HIV-positive pregnant women were assessed for an ARV intervention, including 337 women diagnosed with HIV at PRINMAT facilities, and 199 women who arrived at PRINMAT with a known HIV-positive status. Of these 536 patients, 59 percent were immediately initiated on ART—and an additional 17 percent were referred out to initiate ART elsewhere. Referral-out for ART was largely due to stock-outs of ARVs at some PRINMAT facilities. The remaining 24 percent of HIV-positive clients were considered lost to follow-up after missing two sequential visits. Prior to the SHOPS interventions, none of the 199 women who presented for ANC care at PRINMAT with a known HIV-positive status during the baseline period was initiated on ARVs, since the facilities were not equipped or formally approved to provide the service.

During the monitoring period, 157 HIV-exposed newborns were born to HIV-positive mothers at PRINMAT, an average of 17 HIV-positive deliveries per month. This is compared to an average of three HIV-positive deliveries per month prior to the SHOPS interventions. None of the newborns born to HIV-positive mothers at PRINMAT prior to the intervention received Nevirapine (NVP) prophylaxis, again because PRINMAT was not equipped to provide newborn ARV prophylaxis. After the introduction of PMTCT B+ at PRINMAT, a total of 130 HIV-exposed newborns born at PRINMAT—an average of 14 per month—were initiated at birth on short-course NVP prophylaxis as per Tanzania's national PMTCT B+ protocols. Of the 47 early infant diagnosis HIV tests (DBS DNA-PCR) administered at the PRINMAT facilities, five HIV-exposed infants (10.6 percent) were confirmed to be HIV positive. This can be compared to a typical vertical MTCT rate of 15-40 percent if no PMTCT intervention was delivered (Tanzania Ministry of Health and Social Welfare n.d.).

To summarize, during the nine-month monitoring period following the SHOPS PMTCT B+ interventions, there was a 15-fold increase in total HTC services provided during ANC, labor, and delivery at PRINMAT, with 4.3 percent and 6.5 percent of pregnant women testing positive at ANC and during active labor and delivery, respectively. Of these, 59 percent were initiated on

ART as part of integrated ANC/ PMTCT B+ services—with moderate levels of referrals-out (17 percent) largely due to stock-outs of ARVs. Prior to the SHOPS interventions none of the known HIV-positive women who presented for ANC care at PRINMAT facilities was initiated on ARVs. Additionally, a total of 157 HIV-exposed newborns were born to HIV-positive mothers at PRINMAT, of which 88 percent were initiated at birth on short-course NVP prophylaxis as per PMTCT B+ protocols. 12.2 percent of infants tested HIV positive after birth although a significant number were referred out of the PRINMAT facilities for early infant diagnosis DBS DNA-PCR testing due to persisting commodity access challenges at some PRINMAT facilities.

DISCUSSION

The SHOPS-sponsored PMTCT B+ intervention implemented by PRINMAT nurses and midwives demonstrates the powerful impact private and non-state actors can make in extending PMTCT B+ services to high priority areas. The introduction of PMTCT B+ services at PRINMAT facilities sought to respond to three pillars of the government's EMTCT strategy; addressing the shortage of PMTCT qualified health care workers, involving the private sector, and extending services as part of an integrated community-based service package.

Following the introduction of PRINMAT PMTCT services in June 2014, there was a dramatic and immediate increase in the average monthly number of HTC and PMTCT ARV interventions delivered by the 53 PRINMAT facilities at the community level, with the network providing over 18,000 HIV tests over just nine months of implementation, including over 7,000 HIV tests to pregnant women. ARV interventions increased as well, as did the number of newborns provided with protective ARV prophylaxis.

Despite significant progress in forging relationships between PRINMAT facilities and local government, delayed and inconsistent access to public PMTCT commodities restricted the potential impact of this intervention. This irregular public commodity supply highlights the need for ongoing health system strengthening efforts in parallel to private sector scale-up initiatives, in particular ensuring a consistent PMTCT and ART commodity supply chain to both public and private facilities.

As governments and global public health implementers pursue innovative and increasingly effective strategies to realize an AIDS-free generation, the SHOPS PMTCT B+ effort demonstrates that appropriately engaging private nurses and midwives via PPP can be an incredibly effective way to rapidly scale up PMTCT services. However, given that most countries require private providers to receive national PMTCT and ART certification, and almost all country's restrict or ban private health sector access to controlled PMTCT and ARV commodities, facilities such as those in the PRINMAT network currently function as near de facto public facilities. As such there may be benefit in exploring ways to increase private provider's ability to procure commodities and responding to periodic health system challenges. Without providing the private health sector with additional flexibility and maneuverability in procuring or purchasing PMTCT and ART commodities, particularly during periods of public stock-out, private providers remain vulnerable to the same challenges limiting or stalling PMTCT B+ progress in the public sector.

CONCLUSION

Today, PRINMAT facilities continue to deliver integrated ANC/PMTCT B+ services in Tanzania's poor and underserved communities, with the vast majority now receiving consistent access to public PMTCT B+ commodities. Building on the success of this initial effort, SHOPS and the MOH PMTCT section have trained an additional 35 PRINMAT providers to ensure that all 76 nurse and midwife-led facilities in PRINMAT's national network are certified to provide PMTCT

B+ as part of their ANC service package. The engagement of additional private nurses and midwives in Tanzania and replicating this effort in other high-prevalence settings could be a transformative approach in reaching women and newborns with appropriate HIV care and treatment, contributing to the achievement of an AIDS-free generation.

1 BACKGROUND

Although HIV remains one of the leading causes of death among women of reproductive age and infants worldwide, there is growing optimism that a global AIDS-free generation can be realized. Reaching this goal will require scaling, strengthening, and increasingly targeting HIV interventions that both prevent new infections and ensure that those living with the disease are initiated and retained on antiretroviral therapy (ART) through viral suppression.⁴ A key element in this pursuit is the prevention of mother-to-child transmission of HIV (PMTCT),⁵ which involves the provision of antiretroviral (ARV) drugs, counselling, and support to HIV-positive pregnant and breastfeeding women to safeguard against the vertical transmission of HIV between a mother and her newborn. Over the past few years, seeking to build on progress made by several countries in advancing their national HIV prevention efforts, global public health agencies have intensified their focus on PMTCT as part of combination HIV prevention strategies. In 2011, the



Joint United Nations Program on HIV and AIDS (UNAIDS) assembled a Global Task Team that released updated PMTCT targets outlined in the *Global Plan for the Elimination of New HIV infections among Children by 2015 and Keeping their Mothers Alive* (UNAIDS 2011). These ambitious targets included a reduction in the number of new infections via mother-to-child transmission (MTCT) by 90 percent from a 2009 global baseline, and a 50 percent reduction in AIDS-related maternal deaths among the 21 Global Plan Priority Countries (UNAIDS 2011).

Global PMTCT efforts were further aided by the release of updated programmatic guidance from the World Health Organization (WHO) in 2012, which proposed earlier initiation and lifelong provision of ART to pregnant mothers irrespective of their cluster of differentiation 4 (CD4) count or clinical stage (an approach termed WHO Option B+ as described below in Table 1). This differed from previous approaches (WHO Options A and B) that recommended the provision of ARV drugs to HIV-positive pregnant and breastfeeding mothers during the mother-to-child risk period, and continuing lifelong ART *only* among women who were clinically eligible for treatment (i.e., with a CD4 count under 350 cells/mm³ or at stage 3 or 4 of illness). Importantly, the introduction of WHO Option B+ simplified the provision of PMTCT services, increased the number of pregnant women immediately eligible for ART initiation, and emphasized the long-term health of HIV-positive mothers in addition to preventing new infections among their newborns.

⁴ ART is considered successful when it impairs viral function and replication, and reduces the patient's "viral load" (the amount of HIV in the blood) to undetectable levels. This is termed viral suppression.

⁵ The vertical transmission of HIV from an HIV-positive mother to her newborn during pregnancy, labor, delivery, or breastfeeding is called mother-to-child transmission.

TABLE 1: THREE OPTIONS FOR PMTCT PROGRAMS, WHO 2012

Woman Receives:			
	Treatment (for CD4 count ≤ 350 cells/mm²)	Prophylaxis (for CD4 count >350 cells/mm²)	Infant Receives:
Option A^a	Triple ARVs starting as soon as diagnosed, <i>continued for life</i>	<i>Antepartum:</i> AZT starting as early as 14 weeks gestation <i>Intrapartum:</i> at onset of labor, sdNVP and first dose of AZT/3TC <i>Postpartum:</i> daily AZT/3TC through 7 days postpartum	Daily NVP from birth through 1 week beyond complete cessation of breastfeeding; or, if not breastfeeding or if mother is on treatment, through age 4-6 weeks
Option B^b	<i>Same initial ARVs for both^b:</i>		Daily NVP or AZT from birth through age 4-6 weeks regardless of infant feeding method
	Triple ARVs starting as soon as diagnosed, <i>continued for life</i>	Triple ARVs starting as early as 14 weeks gestation and <i>continued intrapartum and through childbirth if not breastfeeding or until 1 week after cessation of all breastfeeding</i>	
Option B+^c	<i>Same for treatment and prophylaxis^b:</i>		Daily NVP or AZT from birth through age 4-6 weeks regardless of infant feeding method
	Regardless of CD4 count, triple ARVs starting as soon as diagnosed, <i>continued for life</i>		
<p>Source: World Health Organization (2012)</p> <p>Note: "Triple ARVs" refers to the use of one of the recommended three-drug fully suppressive treatment options</p> <p>^a Recommended in WHO 2010 PMTCT guidelines</p> <p>^b True only for Efavirenz (EFV)-based first-line ART; Nevirapine (NVP)-based ART not recommended for prophylaxis (CD4$>$350)</p> <p>^c Formal recommendations for Option B+ have not been made, but presumably ART would start at diagnosis</p>			

In 2014, further PMTCT guidance was provided as part of the President's Emergency Plan for AIDS Relief 3.0 global strategy entitled *Controlling the Epidemic: Delivering on the Promise of An AIDS-free Generation* (Department of State 2014). The strategy emphasized achieving an AIDS-free generation by refocusing efforts, making the most of international and domestic resources, and targeting interventions for high impact. This includes implementing the "right interventions," in the "right place," at the "right time"—such as targeted efforts to extend PMTCT and lifelong ART to mothers, reaching neglected populations and locations, extending treatment options to disproportionately affected young women and girls, and re-focusing efforts on community-level impact (Department of State 2014).

Importantly, the introduction of these updated global guidelines and their adoption in several high-HIV prevalence settings have significantly and immediately increased the number of HIV-positive pregnant women who are eligible for lifelong ART initiation, earlier in their disease progression, and at the time of HIV diagnosis. Given the existing capacity deficits facing many national HIV programs—in particular severe shortages of human resources for health, and limited coverage of services in rural and hard-to-reach areas—innovative service delivery

options are needed to address gaps and sufficiently scale up PMTCT service provision and access to all pregnant women now eligible for early ART initiation as part of PMTCT B+ protocols.

1.1 GLOBAL PMTCT PROGRESS AND GAPS

Effective PMTCT interventions can reduce the risk of MTCT from 15-45 percent in the absence of an intervention to less than 5 percent, with PMTCT services also serving as an important gateway to family-focused HIV prevention, treatment, and care (World Health Organization 2015b; AIDSTAR-One, n.d.). The number of pregnant women living with HIV who are receiving ARV prophylaxis or lifelong ART initiation has increased significantly since the early 2000s, when PMTCT and ART efforts were just beginning in many high-HIV prevalence countries. For instance, the *2014 Progress Report on the Global Plan* reports a 43 percent reduction in new HIV infections among newborns and infants in the 21 priority countries, from 350,000 new infections among newborns in 2009 to 199,000 in 2013 (UNAIDS 2014a). Further, the proportion of pregnant women living with HIV who receive ARVs for PMTCT doubled over the five-year period, from three out of every 10 pregnant women in 2009 (33 percent) to almost seven out of every 10 (68 percent) in 2013 (UNAIDS 2014a). However, 40 percent of HIV-positive breastfeeding mothers are still not receiving appropriate ARV prophylaxis, and UNAIDS reports that between 2012 and 2013 the pace of progress in reducing new HIV infections among newborns actually slowed or stalled among several global plan priority countries such as Botswana, South Africa, and the United Republic of Tanzania (UNAIDS 2014a).

The expansion of PMTCT and ART eligibility criteria under WHO Option B+ has provided the opportunity to initiate more pregnant women on ART earlier and at the time of diagnosis. While this holds tremendous promise to prevent new HIV infections among newborns and to save the lives of mothers, it also poses significant operational, programmatic, and technical challenges to health leaders and implementers in many resource-poor countries (World Health Organization 2013). For instance, the severe shortages of health care workers in many countries around the world has been identified as a critical constraint to achieving public health and development goals, such as the extension of PMTCT services (Rakibul Hasan 2007). These human resource shortages, as well as inadequate ARV and commodity supply, limited infrastructure, and health financing deficits have all constrained further extension of PMTCT coverage in many high-HIV burden and resource-constrained settings. Furthermore, many women in these settings who may be HIV positive but unaware, choose to deliver their babies at home without the assistance of a professional health care worker and disconnected from necessary HIV Testing and Counseling (HTC) and PMTCT services. In the current era of static and declining donor funding for HIV, it is necessary to maximize the use of existing resources and develop innovative service delivery strategies that will reach more women and newborns with PMTCT services, accelerate progress, and sustain PMTCT and ART programs long term. In contexts facing a severe shortage of medical personnel, sharing basic or complex clinical tasks with non-physician health cadres (a practice referred to as task-sharing as described in Box 1), or extending PMTCT to non-state health providers in the private commercial and nonprofit sectors could lead to high-impact gains in the extension of PMTCT B+ services to the expanding cohort of pregnant HIV-positive women requiring this intervention.

Over the past several years, task-sharing of PMTCT B+ responsibilities with nurses and other non-physician health cadres (Ellis 2010; Walsh et al. 2010), scaling-up the involvement of the private health sector (Webb et al. 2012), and targeting PMTCT service delivery to community-based points of access (Busza et al. 2012) have all gained momentum as potentially powerful strategies to help reach global PMTCT objectives. Depending on the context and intervention used, these strategies have the potential to alleviate human resource shortages, mobilize

partnerships, and more effectively leverage all available health personnel and resources in scaling up and extending PMTCT service provision to areas most in need.

2 HIV AND PMTCT IN TANZANIA

The United Republic of Tanzania, a democratic country in East Africa with a population of approximately 49.6 million people (Central Intelligence Agency 2014), has been hard-hit by the HIV epidemic, particularly among the approximate 70 percent of the total population who live in rural or hard-to-reach areas (World Bank 2015). Although Tanzania has recently become one of the fastest growing economies in Africa, the nation's pursuit of economic growth and middle-income country status remain constrained by severe public health challenges, including a national adult (15-49 years) HIV prevalence estimated at approximately 5.1 percent (UNAIDS 2014b). This translates to an estimated 1.4 million Tanzanians living with HIV and AIDS, 56,000 new adult infections per year, and nearly 80,000 AIDS-related deaths annually (UNAIDS 2013; UNAIDS 2014b). Women and children are particularly affected by the epidemic, with an estimated total female prevalence of 6.2 percent translating to 730,000 adult women living with the disease (Tanzania Commission for AIDS 2015), a prevalence of 6.9 percent among pregnant women attending antenatal care (ANC) (Tanzania Ministry of Health and Social Welfare 2012), and over 16,000 new infections among children annually (UNAIDS 2014b). In addition, there are an estimated 119,000 HIV-positive pregnant women giving birth annually, with approximately 50 percent of those deliveries occurring at home without support from a health professional and/or the provision of appropriate HTC and PMTCT interventions. Although PMTCT coverage has significantly improved in Tanzania since the emergence of the epidemic, as of 2013 only 70 percent of HIV-positive pregnant women and 56 percent of HIV-exposed newborns and infants were receiving necessary ARV prophylaxis (Tanzania Ministry of Health and Social Welfare, n.d.). Given these service delivery shortfalls, the MTCT rate remains at approximately 15 percent, with nearly 18 percent of under-five child mortality attributed to AIDS-related causes (Tanzania Ministry of Health and Social Welfare n.d.). In 2012, a Global Plan Interim Report summarized Tanzania's ongoing PMTCT challenges, highlighting a decline of only 19 percent in new child infections since 2009, placing Tanzania in danger of not reaching PMTCT targets (UNAIDS 2014a).

2.1 TANZANIA'S EMTCT STRATEGIC PLAN

In seeking to address the persisting challenges outlined above, the Government of Tanzania and Ministry of Health and Social Welfare (MOHSW) are currently implementing two important PMTCT-related strategic plans. The first, the *Tanzania Elimination of Mother to Child Transmission of HIV Plan (2012-2015)* outlines the broad PMTCT B+ goals of extending access to ARV prophylaxis and treatment, early infant diagnosis (EID), and overcoming identified bottlenecks in achieving PMTCT targets (Tanzania Ministry of Health and Social Welfare 2012). The national strategic plan and PMTCT program are based on the four-pronged model recommended by the United Nations, including the prevention of vertical transmission of HIV from mother to child (Prong 3) and increasing access to HIV treatment, care, and support for women living with HIV, their children, and family members (Prong 4) (Tanzania and Ministry of Health and Social Welfare 2012). This includes the scale-up of HTC, broad distribution of ARVs to prevent MTCT, providing appropriate infant feeding counselling and interventions, increasing access and uptake of ARV prophylaxis and treatment among pregnant and breastfeeding women and their newborns, and ensuring early diagnosis of HIV-exposed infants (Tanzania and Ministry of Health and Social Welfare 2012). The second guiding document, the *National Road Map Strategic Plan to Accelerate Reduction of Maternal, Newborn, and Child Deaths in*

Tanzania (2008-2015) integrates the national PMTCT strategy into the country's broader maternal, newborn, and child health service delivery strategy (Tanzania Ministry of Health and Social Welfare 2008). Specifically, the document outlines that successful extension of PMTCT Option B+ will necessarily occur at the facility level, where PMTCT services are fully integrated into routine reproductive, ANC, and child health services (Tanzania and Ministry of Health and Social Welfare 2008).

Both plans outlined above also acknowledge the multiple supply- and demand-side challenges currently constraining national scale-up of PMTCT services, and propose several strategies to overcome them:

2.1.1 THE HUMAN RESOURCES FOR HEALTH CRISIS

Tanzania currently suffers from a severe shortage of health care professionals, possessing one of the worst health care provider-to-patient ratios in the world. As of 2012 there were only 0.03 physicians and 0.37 nurses and midwives for every 1,000 people (World Health Organization 2015a; ChartsBin 2011), with a total of three health providers for every 10,000 patients being well below the WHO-recommended critical human resources for health threshold of 23 providers per 10,000 patients (World Health Organization 2010). Tanzania's *Health Sector Strategic Plan III (2009-2015)* states that total staffing in the health sector stands at 35 percent of actual staff needs, with a total deficit of over 90,000 health professionals being most acutely felt in rural districts. As outlined in the national elimination of mother-to-child transmission (EMTCT) strategic plan, the nationwide shortage of health care workers has been a severe barrier to achieving PMTCT targets. Lack of qualified staff (particularly in remote areas), limited incentives for existing workers to work in remote or hard-to-serve areas, limited public funds for salaries, high workloads and burnout, HIV stigma and discrimination among health care workers themselves, and weak human resource management have all been significant challenges (Tanzania Ministry of Health and Social Welfare 2012).

To address these human resources for health obstacles and achieve PMTCT targets, the strategic plan calls for health implementers to pursue task-sharing of PMTCT activities with nurses, midwives, and other non-physician health cadres, strengthening pre- and in-service coaching, and mentoring as part of that approach (Tanzania and Ministry of Health and Social Welfare 2012). (See Box 1 for a description of task-sharing.) It further calls for integration of PMTCT and EID within the existing national ANC and child health platform, and better use of existing ANC and child health professionals to deliver an integrated ANC/PMTCT service package. Task-sharing of PMTCT B+ interventions is further recommended in the Strengthening Health Outcomes through the Private Sector (SHOPS)-supported *Scope of Practice for Nurses and Midwives in Tanzania (2014)* (discussed further below) and the forthcoming national task-sharing strategy (pending release from the MOHSW in 2015).

Box 1. Task-Sharing (or Task-Shifting)

Task-sharing/task-shifting refers to the rational redistribution of health care tasks among health workforce teams. It is recommended by the WHO and other global public health agencies as one method of strengthening and expanding the health workforce to rapidly increase access to HIV and other key health services (World Health Organization 2008).

Task-sharing has been promoted as a way to implement team-based approaches in the delivery of HIV services, sharing treatment tasks among diverse non-physician health cadres such as nurses and midwives. This approach is needs-based and non-hierarchical, and "differs from more traditional care in which a physician was either the only or the primary point of contact with the patient (Olson 2012)."

2.1.2 OPPORTUNITIES FOR IMPROVED PUBLIC-PRIVATE PARTNERSHIP

In addition to better use of existing Tanzanian health care workers via task-sharing and maternal, newborn, and child health service integration, the national EMTCT strategic plan calls for increased political commitment to partnerships, in particular increasing collaboration with the private sector within the reproductive and child health (RCH) and HIV/AIDS programs at the national, regional, and district levels (Tanzania Ministry of Health and Social Welfare 2012). As several global case studies have demonstrated, engaging the private health sector can be a very effective way to rapidly scale up and strengthen the delivery of key public health services, in particular when implemented as part of considered and well-articulated public-private partnerships (PPPs) (Rao et al. 2011; World Health Organization 2015c). A Private Health Sector Assessment (PSA) carried out by SHOPS in 2012 confirmed that Tanzania possesses a robust and organized private health sector that could indeed play stronger role in meeting national health targets (J. White et al. 2013). The PSA revealed a broad range of commercial for-profit, nonprofit, and faith-based entities currently engaged in health in Tanzania, with numerous and diverse facilities and businesses delivering a wide range of clinical, medical laboratory, pharmaceutical, and allied health services. However, the PSA also demonstrated several barriers that restricted private providers from taking a more active role in the delivery of essential services like PMTCT, such as limited access to nationally required trainings, restrictions on PMTCT commodity access, and persisting competition rather than collaboration between public and private actors at the district level (J. White et al. 2013).

Tanzania's national EMTCT plan calls for national and district health leadership to leverage private health providers and other private entities in PPPs, in order to forge strong multi-sectoral collaboration that will help achieve the country's PMTCT objectives. Recently, the MOHSW has broadly acknowledged the crucial role private health facilities will play in extending the provision of PMTCT services, scaling up coverage of integrated service packages, and closing geographic and financial gaps (Tanzania Ministry of Health and Social Welfare 2012; Bucagu and Muganda 2014). The United States Agency for International Development (USAID) and the MOHSW have further called for efforts to harmonize the national AIDS response, increasing cooperation and communication between public and private actors, and strengthening referral systems between health facilities, sectors, and communities. However, although it has been recognized that Tanzania's private health sector could play a key role in scaling up the immediate availability of human resources, health infrastructure, and financing for PMTCT, the MOHSW and PPP-technical working group (TWG) have acknowledged the need for operational experience and best practice models to inform PPP and collaborative service delivery strategies.

2.1.3 DELIVERING AN INTEGRATED COMMUNITY-BASED PMTCT B+ SERVICE PACKAGE

In order to close geographic gaps in PMTCT coverage and to ensure that services reach key affected groups and areas, the government of Tanzania has called for PMTCT B+ to be delivered as part of an integrated community-based package of primary health care (PHC) and maternal and child health (MCH) services (Tanzania Ministry of Health and Social Welfare 2012). Several international efforts have demonstrated the efficacy and appropriateness of community-focused PMTCT service delivery strategies, in particular the utility of integrating PMTCT with ANC and other MCH services (Bucagu and Muganda 2014; Busza et al. 2012; Suthar et al. 2013). Building on this global evidence and experience, the MOHSW has formally recommended several community-based strategies to extend the provision of and access to PMTCT B+ services in underserved regions of Tanzania. This includes developing a harmonized community intervention service package for EMTCT and pediatric HIV care that is

based on best practice models, and strengthening community-based systems and structures to deliver community-based interventions (Tanzania Ministry of Health and Social Welfare 2012).

In addition, the Government of Tanzania has also called for better utilization of community-based service providers, civil society organizations, and professional organizations in all sectors to deliver the national EMTCT plan. Such a strategy is imperative in extending PMTCT services to underserved populations in Tanzania, in particular those seeking to overcome the personal, financial, geographic, and social barriers (i.e., fear of the disease, poverty, stigma and discrimination) that currently prevent many Tanzanian women from accessing HIV or ANC services. In this pursuit, innovative service delivery strategies and best practice models are needed to help extend services directly to high-need communities, reduce the need for referrals or patients travelling long distances to care, and initiate and retain HIV-positive pregnant women on ART via patient-friendly services located in their home communities. Furthermore, by integrating PMTCT services with other PHC and MHC services, practitioners can seek to meet multiple health needs in one health care contact and via one comprehensive point of care.

2.1.4 PURSUING AN INNOVATIVE PMTCT MODEL IN TANZANIA

The SHOPS PSA (2012) revealed numerous missed opportunities to strengthen the private sector's role in achieving this objective. Although numerous private health sector actors expressed a desire to participate more fully in the national AIDS response, private providers have historically been excluded from required national PMTCT and ART trainings, have had limited or restricted access to PMTCT B+ commodities (i.e., HIV rapid diagnostic tests (RDTs), dry blood spot (DBS) collection kits, and ARVs), and may have experienced a climate of competition rather than cooperation with the public sector (J. White et al. 2013). As such, engaging the private health sector in PMTCT required an intervention that promoted collaboration between the public and private health sectors, formalized the private sector's role in the national AIDS response, and clarified the roles and responsibilities of various health cadres in both the private and public sectors. Furthermore, any intervention pursued would require an emphasis on existing barriers to MCH and HIV care; including the large rural population of Tanzania, very low income per capita, low attendance at ANC and MCH services, a high proportion of home-based deliveries,⁶ and geographic or financial barriers to HTC and PMTCT care.

The SHOPS project implemented an innovative PMTCT B+ service delivery intervention that targeted the three priority elements outlined in the MOH's national EMTCT plan: addressing the human resource shortage, promoting PPP and private sector engagement, and scaling up a community-based and integrated PMTCT service package. Given its strong existing network of private sector nurses and midwives delivering ANC and child health services in peri-urban and underserved communities in Tanzania, the Private Nurses and Midwives Association of Tanzania (PRINMAT) was identified as the focal partner organization to scale up targeted delivery of PMTCT B+ services.

⁶ Only 50 percent of deliveries occur at a health institution, and only 48.9 percent are attended by a skilled professional (UNICEF 2013).

3 THE PRINMAT NETWORK

PRINMAT, founded in 1999, is a professional association and service delivery network of private health care workers dedicated to improving health outcomes among underserved mothers and children in Tanzania. The association is maintained by a Dar es Salaam-based national secretariat, supporting 78 individual member facilities that provide nursing and midwifery, ANC, and child health services to urban, peri-urban, and rural communities throughout Tanzania. PRINMAT's mission is to reduce morbidity and mortality among women and children in underserved communities through the provision of high-quality maternal, child, and family-focused health services. PRINMAT-associated health facilities, led by nurses and midwives, provide a spectrum of PHC- and MCH-focused services, and are key sources of health promotion and information via community-based outreach. Each facility is legally registered with the Tanzania Nursing and Midwifery Council (TNMC) as a private not-for-profit business adhering to service fee limits and committing to equitable access among lower socio-economic groups in order to enjoy tax exemptions and government commodity subsidies as part of that legal status. The PRINMAT secretariat also provides a national advocacy function to the member facilities, representing the interests and perspectives of private nurses and midwives in national health fora and working groups.

Box 2. Services Provided at PRINMAT Facilities Targeted for PMTCT B+ Training

- Counseling on family planning methods (96 percent of facilities)
- Distribution of family planning commodities (88 percent)
- ANC (84 percent)
- L&D services (91 percent)
- Postnatal care (88 percent)
- Under-five immunizations (40 percent)
- HTC (26 percent)
- PMTCT services (3.5 percent)
- HIV care and treatment (none)

3.1 THE PRINMAT FACILITIES

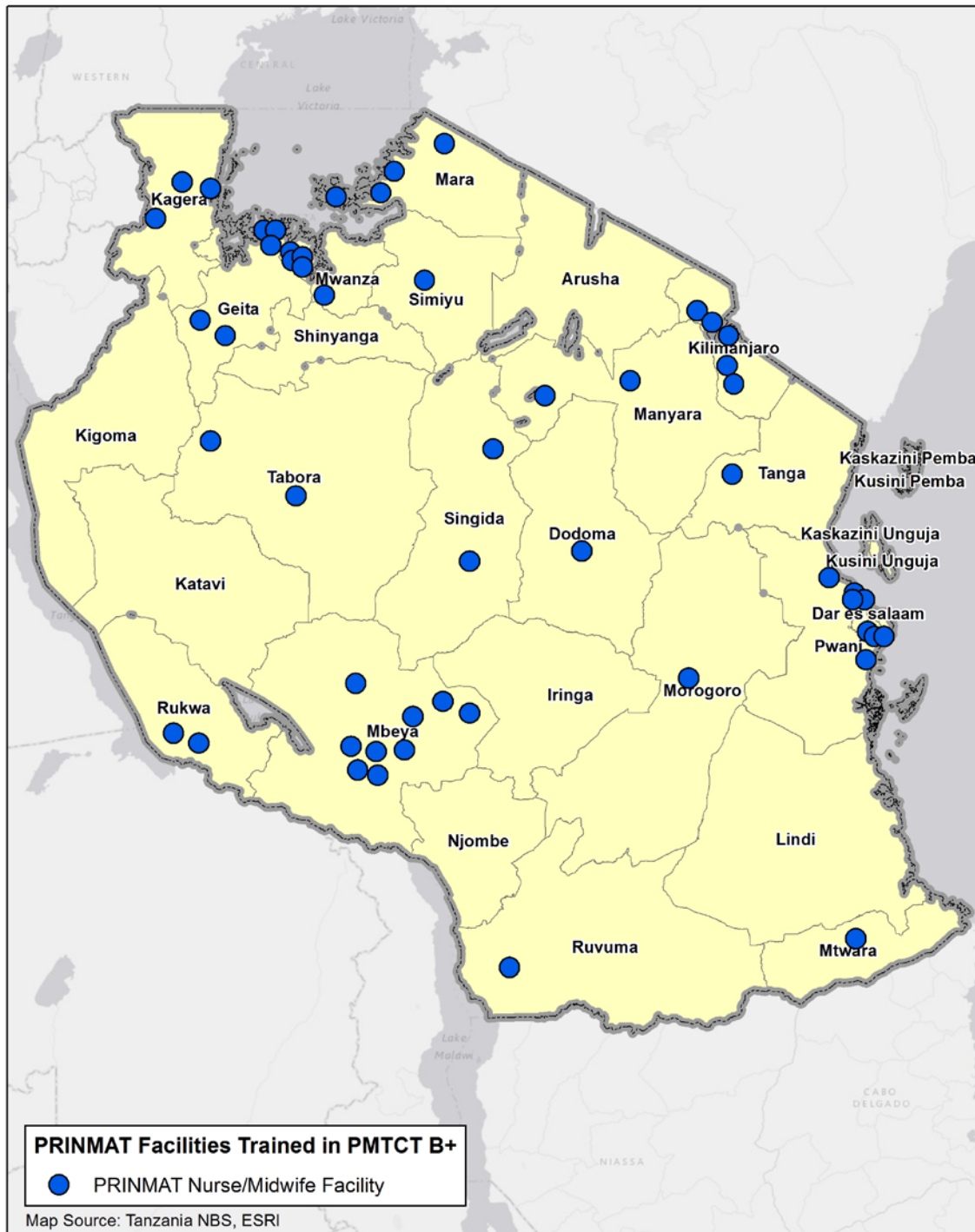


SHOPS identified 73 individual nurses and midwives to participate in the private sector PMTCT B+ intervention, a group representing 53 separate PRINMAT-affiliated facilities. The providers and facilities were selected in collaboration with the PRINMAT secretariat and MOHSW PMTCT section, prioritizing the selection of facilities and locations serving vulnerable populations, including the urban poor and rural underserved communities. As indicated in the map in Figure 1, 63 percent of the targeted PRINMAT facilities were located in urban and peri-urban areas, with 35 percent located in remote or rural areas.



PRINMAT facilities mainly serve a clientele of women and girls, with nearly all facilities providing family planning, ANC, labor and delivery (L&D), and MCH services as part of their core service package. (See Box 2 for list of common PRINMAT services.) Patient volumes vary depending on the size and location of the facility. Among the 53 facilities targeted for PMTCT B+ training, 28 percent reported ANC patient volumes of more than 20 women per week, followed by 23 percent reporting 5-10 individual ANC visits per week. The facilities also reported serving mostly low-income patients, with several respondents reporting a client base of over 80 percent low-income patients. However, these were estimates based on provider perception and there was no formal measurement of patient income quintiles or poverty indicators.

FIGURE 1: LOCATION OF PRINMAT FACILITIES TRAINED IN PMTCT B+ AS PART OF THE SHOPS INTERVENTION



As per their private nonprofit legal status, PRINMAT facilities have a mandate to keep service fees low and to promote equity of access among the poor by reducing out-of-pocket costs passed on to patients. In addition, a large proportion of PRINMAT's patients are pregnant women and children under five, both of whom are considered fee-exempted high-risk groups by Tanzania's 1994 waiver and exemption policy (Tanzania Ministry of Health and Social Welfare 1994). As such, PRINMAT operates largely on a cost-recovery basis, charging very low consultation and associated service costs, and providing a large volume of fee-exempted services such as free immunizations, reproductive health care, and other essential services outlined in the MOHSW 1994 exemptions policy. The MOHSW provides PRINMAT with free equipment and commodities (such as refrigerators and vaccines) to equip them to deliver exempted services, with PRINMAT covering the costs of overhead, infrastructure, and human resources as part of what the PRINMAT Executive Secretary described as their "contribution to the social good."

Box 3. Illustrative PMTCT-Related Service Fees at the FACGBF PRINMAT Facility Located in Bagamoyo, Pwani Region

Fee for Service:

- ANC consultation = \$0.50
- Hemoglobin test = \$1.50
- Urinalysis = \$1.00
- Syphilis test = \$1.00
- Labor and delivery intervention = \$15.00
- Blood sugar test = \$1.00
- Malaria RDT = \$1.00

Fee-Exempted Services:

- Child immunizations
- Drug dispensing; clients only pay the relevant drug costs
- HTC
- ARV medicines (for PMTCT)
- Maintenance of ART



Based on a questionnaire that SHOPS conducted with providers from the 53 targeted facilities, PRINMAT facilities generate revenue for operations from diverse sources. Seventy-two percent of facilities reported accepting out-of-pocket payments from clients, 15 percent deliver services paid for by the government, and 3 percent accept payments from the National Health Insurance Fund or Community Health Fund insurance schemes. In addition, 19 percent of the clinics reported providing at least some services without cost recovery as part of a social responsibility or pro-poor component of their mandate. The service fees outlined in Box 3 are illustrative of a common PRINMAT fee schedule.

3.2 THE PRINMAT PMTCT B+ TRAINEES



In order to gain additional insight into the composition of the PRINMAT training group, and to gather further details about the PRINMAT providers and facilities being equipped to deliver PMTCT, SHOPS conducted pre- and post- focus group discussions (FGDs) and applied a pre-training questionnaire with the nurse and midwife trainees (discussed in detail in chapter 4). The following insights were revealed about the 75 PRINMAT providers targeted for this effort:

- Average provider age was 46 years old; the youngest provider was 22 and the oldest was 70.
 - The highest education level among the majority of trainees (68 percent) was a secondary-level diploma. Sixty percent also held a nursing certificate, 20 percent held a nursing diploma, and 14 percent held an advanced diploma. None of the trainees held a university degree.
 - The average length of service as a nurse was 20 years; the shortest was one year and the longest was 42 years of practice.
- The average length of service with PRINMAT was four years; the shortest was less than one year and the longest was 15 years in service at PRINMAT.
 - Almost two-thirds of trainees had previously received supplemental clinical training: 75 percent had received family planning training, 73 percent had received advanced instruction in ANC, and 73 percent had been trained in safe delivery skills.
 - Some providers (31 percent) had received some form of continuing professional development related to child health, and only 4 percent had training on treatment of tuberculosis.
 - Very few providers had received any supplemental training or skills development in HIV service delivery. Only 18 percent had received formal training on HTC, less than 4 percent on PMTCT, and none on the provision of ART.



3.3 PERCEIVED NEED AND DEMAND FOR PMTCT SERVICES AT PRINMAT

The pre-implementation FGDs carried out with the trainees prior to roll-out also explored provider perceptions of demand for PMTCT B+ among their existing patient caseload and in their community. Based on responses from the nurse and midwife trainees, there was a widespread belief among PRINMAT providers that the expansion of PMTCT B+ services to private facilities such as PRINMAT was needed to reach national PMTCT targets. Perceived demand for PMTCT services among existing PRINMAT clients was high, with providers stating that their ability to provide PMTCT B+ would strengthen the continuum of care for pregnant clients from presentation at ANC through safe delivery and retention on ART. Providers also felt that being able to provide PMTCT services within women's own communities would increase the number of pregnant women seeking out these services. Prior to the training, only 23 PRINMAT facilities offered HTC services and there were very few reported formal referrals-out for HTC or ART. If a patient requested an HIV intervention during ANC services at PRINMAT, the provider would typically informally refer the patient to HTCT and PMTCT services at the nearest public care and treatment center (CTC). In addition, during the baseline, only 12 babies were born to HIV-positive women who lived in communities near PRINMAT facilities and were brought for care at a PRINMAT facility and subsequently referred elsewhere for EID.

PRINMAT providers also noted their clients' expressed demand for 'one-stop' HIV and ANC services, and how limiting the need for referral to other health centers would strengthen PRINMAT providers' ability to retain HIV-positive clients in care. One provider stated that PRINMAT's current lack of capacity to deliver PMTCT B+ was leading to unknown outcomes for at least some pregnant clients needing an HIV test:

"[Our services] are not currently satisfactory because most mothers would like to get all services in one place. Now, when you refer her, she finds that very disturbing, and sometimes they don't go [to receive HIV care] – Mwanza participant

Providers also cited long queues, over-crowding, stigma and discrimination from public staff, and public pharmacy stock-outs as additional reasons their patients resisted being referred for HTC or HIV/ANC care at public CTCs. Providers further stated that they believed expanding the range of PMTCT services provided at PRINMAT facilities would lessen the burden on patients, and make their access to HIV-focused ANC care more convenient.

Participants also anticipated increased client volumes at their facilities after introducing PMTCT B+. While some providers stated that this would improve their ability to meet client needs, others were unsure how they would go about accommodating the larger caseload while simultaneously maintaining the quality of all services. As the provider questionnaires demonstrated, the few facilities that had a provider trained to deliver the HTC portion of PMTCT services prior to the SHOPS intervention were over-extended once demand increased. One respondent from Dar es Salaam expressed her concern over being unable to address client demand:

"Personally I'm not worried about [obtaining] the medicines; but there is a danger of losing clients because of [not being able to minimize] long queues." – Dar es Salaam trainee

3.4 PRINMAT FACILITIES' RELATIONSHIP WITH GOVERNMENT

One of the key concerns participants expressed prior to training was their existing relationships with district health management teams (DHMTs) and district medical officers (DMOs) managing the public health sector in their respective communities. Pre-training provider questionnaire responses indicated that engagement with district health officials occurred relatively infrequently and in most cases at low intensity or in a punitive fashion. The tone and strength of relationships between the PRINMAT facilities and their respective DHMTs was largely aligned with whether the facility had previous experience delivering child immunizations and other public health campaigns. PRINMAT facilities that had experience working with their local council were confident that these relationships could be maintained when it came to PMTCT. However, some facilities reported a history of tense or hostile interactions with the public sector that might complicate their PMTCT efforts. Formal interaction with the government in terms of planning and regulation was also varied. While 65 percent of the facilities reported receiving a supportive supervision visit from the DHMT quarterly, 7 percent reported a visit only annually, and 16 percent reported having never received a visit from the local government. Demonstrating that at least some strong public-private relationships existed, 6 percent of the facilities reported receiving a supportive supervision visit at least once a month. Only 12 percent of providers had ever been involved in the council's annual planning process.

3.4.1 ACCESS TO ARV MEDICINES AND OTHER PUBLICALLY CONTROLLED COMMODITIES

Due to the varied relationships with government, several respondents were sceptical that national or local government would support them in delivering PMTCT B+, in particular in terms of access to required commodities such as HIV rapid diagnostic tests (RDTs), dried blood spot (DBS) test kits, and ARV medicines. Several providers felt that improving their relationship and receiving support from DHMTs would be critical to PRINMAT facilities' ability to successfully provide and improve PMTCT services. Many thought that the government would need to be an important partner in their private service delivery efforts in terms of delivering training, procuring commodities, receiving formal referrals of complex cases, and perhaps even receiving future reimbursements for services rendered.

Commodity access was of particular concern:

"Things are still uncertain for me. Since I opened my facility, collaboration from the council has been minimal; I have not received any HTC or other equipment yet, but clients want the services so I have to buy [them myself]." – Mwanza trainee

"The challenge for me is that it has taken a long time [to receive government commodities]. When I purchase them I still offer them for free but I have to look for other ways to compensate the costs with other [paid] services." – Dar es Salaam trainee

3.4.2 PMTCT B+ REFERRALS TO PUBLIC FACILITIES

Many respondents also discussed past difficulties when they tried to refer patients to public facilities, due to pervasive public-private tension. As the following quote from a Mwanza trainee illustrates, some respondents indicated that they prefer to write a personal letter of referral so that it is not obvious the patient is coming from PRINMAT:

“I normally use [personal] letters [to refer] because if she goes with a PRINMAT referral form, before they even get in they are chased away... ”Go back to where you are coming from, you seem to have money!” – Mwanza trainee

The quote above is consistent with reports from several other PRINMAT providers, who said that their patients had been turned away from public facilities because staff in certain public facilities feel that private PRINMAT patients, perceived to have money to access services elsewhere, should not be seeking services in the public sector. Since this feeling is not universal, some respondents posited that public facilities that refuse PRINMAT referrals are likely not educated about the partnership between PRINMAT and the government.

In short, the PRINMAT network presented a very strong opportunity to rapidly scale up the delivery of integrated ANC and PMTCT B+ services. Providers perceived a high demand among their existing patients, a desire to expand their services to meet client needs, and their belief that they could increase the number of clients receiving an HIV intervention and being retained on therapy. However, several providers were concerned about accommodating increased patient caseloads while maintaining the quality of their services, and many were worried about receiving government training, commodities, and collaboration in implementing the new service. The SHOPS intervention was designed to seize this opportunity and address these concerns.

4 THE SHOPS PMTCT B+ INTERVENTION

In response to opportunities revealed during the PSA and observed gaps in the coverage of PMTCT B+ services, SHOPS partnered with several public and private entities to develop and implement a PPP to extend the availability of PMTCT services in Tanzania. SHOPS pursued an intervention that would comprehensively address the three priorities for PMTCT outlined in Tanzania's EMTCT plan: the integration of HIV services with ANC and PHC; involvement of the private health; and delivering services to underserved pregnant women at the community level. The overall goal of the intervention was to immediately scale up the availability of PMTCT providers in Tanzania via task-sharing to nurses and midwives, mobilizing a national network of private ANC facilities, and targeting the intervention to extend PMTCT B+ services to women and infants in high-need communities.

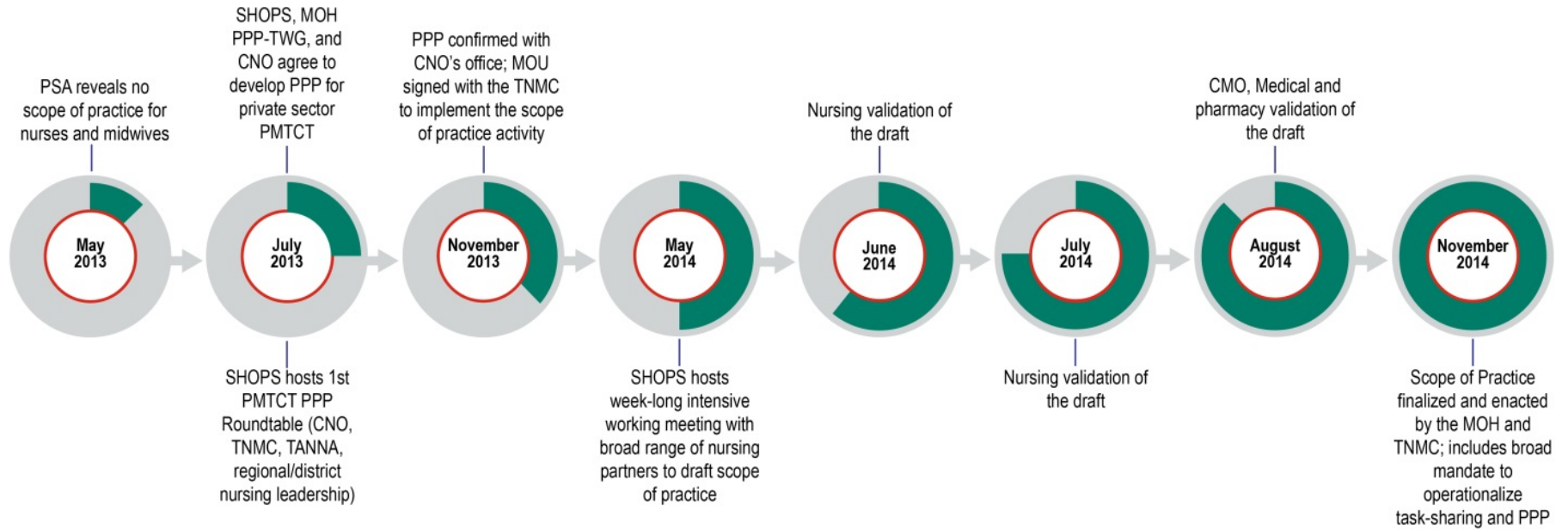
4.1 METHODOLOGY

4.1.1 POLICY INTERVENTION: PPP FOR NURSE AND MIDWIFE HIV TASK-SHARING

In contexts facing a severe shortage of medical personnel, sharing basic or complex clinical tasks with non-physician health cadres via task-sharing (defined in Box 1 above) can be a powerful way to increase available human resources in the health sector. The SHOPS PSA in Tanzania revealed that many public sector nurses and midwives were delivering some portion of services along the PMTCT B+ cascade of care, and that at least some private nurses and midwives were delivering HTC to pregnant women. However, discussions with nursing leadership at the national level revealed that nurse and midwife involvement in PMTCT and other HIV tasks were not explicitly defined or protected in a formal scope of practice.⁷ Although the National PMTCT Guidelines endorsed by the MOHSW recognized the supportive role nurses and midwives made in the delivery of HIV services, and although several public sector nurses had been trained by the MOHSW PMTCT section to deliver HTC and PMTCT to pregnant women, a roundtable held with several public and private nursing stakeholders in July 2013 revealed that a scope of practice was needed that defined, extended, and solidified the role of nursing and midwifery in PMTCT B+ and ART. In order to fill this policy gap, in November 2013 SHOPS partnered with the office of the Chief Nursing Officer (CNO) and the TNMC to develop Tanzania's first scope of practice for nurses and midwives. This was pursued in order to develop a supportive policy environment that could guide improved utilization of nurse and midwife professional cadres, and protect them in their delivery of PMTCT B+ and other HIV services.

⁷ In nursing, "Scope of Practice" typically refers to the legal, professional, and clinical parameters of care, as well as the full range of roles and responsibilities, that nurses are educated, competent, and authorized to perform (D. White et al. 2008).

FIGURE 2: THE SHOPS AND TNMC SCOPE OF PRACTICE POLICY INTERVENTION



In May 2014, SHOPS, the CNO, and the TNMC hosted an intensive week-long consultation and draft-creation working meeting in Bagamoyo district, Pwani region. The workshop brought together over 40 representatives of Tanzania’s nursing and midwifery leadership, including representatives of public and private training institutions and nursing professional associations, nurse and midwife researchers and educators, and a broad range of nurses and midwives from both sectors representing multiple disciplines and specialties. In August 2014, the draft document was reviewed by several additional nursing and midwifery stakeholders and disease specialists, and was then validated at a working meeting by Tanzania’s Chief Medical Officer (CMO) and a broad range of medical and pharmacy health leadership. The document was finalized and launched by the Principal Secretary of the MOHSW, represented at the launch by the Director of Human Resources Dr. Muta, and the TNMC in November 2014. Importantly, among other extensions of responsibility, the scope of practice promoted task-sharing of PMTCT B+ to nursing and midwifery cadres at the certificate level and above, and prescribing authority for adult ART to nurses and midwives at diploma level and above. It also promoted PPP and multi-sectoral collaboration by calling for enhanced engagement of nurses and midwives in all sectors. The scope of practice was launched in parallel to the SHOPS PMTCT B+ service delivery intervention outlined in this report, and paved the way for additional SHOPS activities focused on advancing nurse-initiated and -managed ART in other regions of Tanzania.

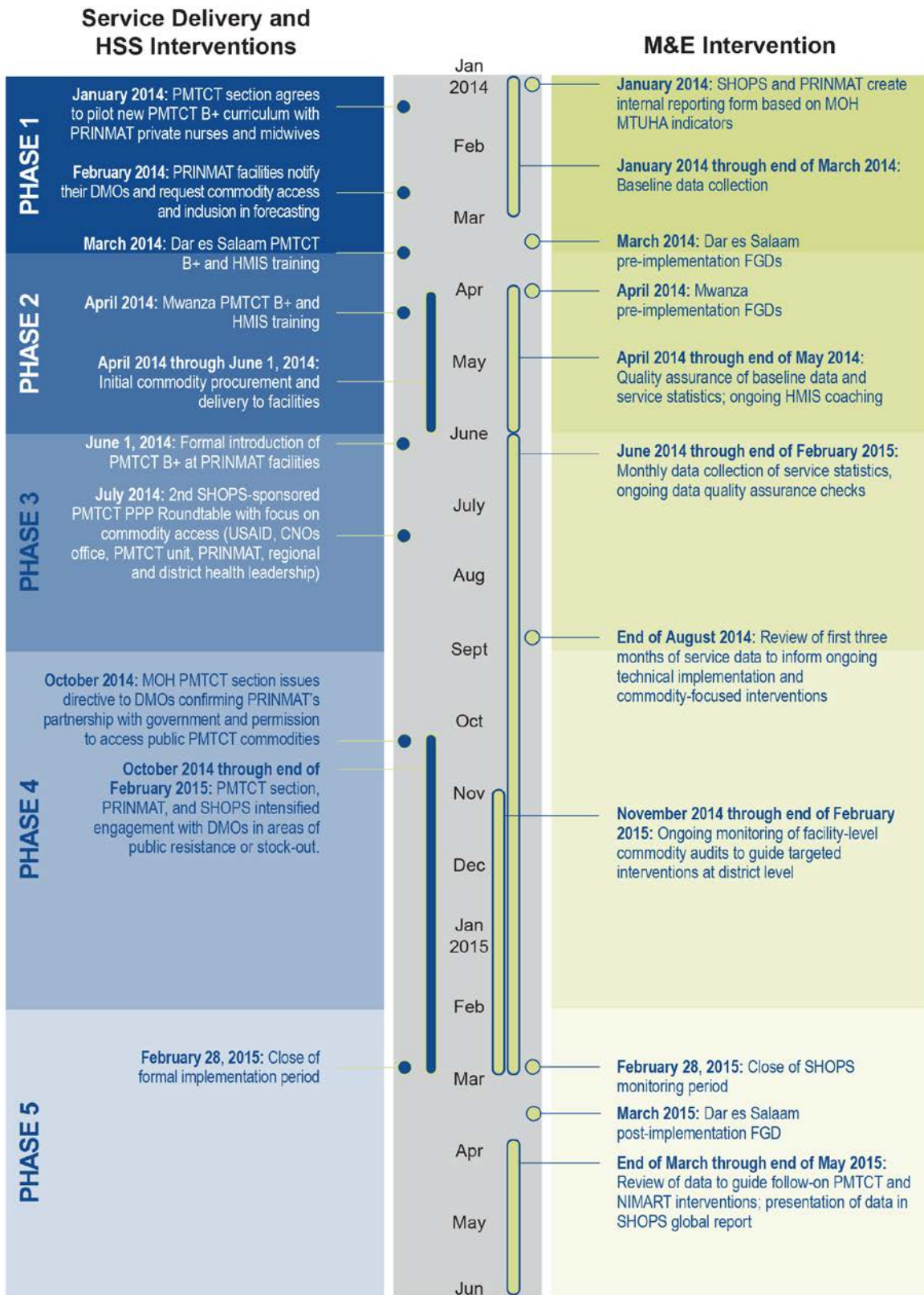
Box 4. Key Inclusions in the Tanzania Scope of Practice for Nurses and Midwives

- Authority to prescribe and dispense ARVs for PMTCT and adult ART
- Authority to perform minor surgical procedures
- Authority to prescribe other medicines and perform complex interventions for MCH, infectious disease, and other essential public health needs
- Creates and defines a cadre of advanced nurse practitioners in nine disease specialties; including child health and infectious disease
- Applies to all public and private nurses and midwives in Tanzania, promotes broad HIV and PHC task-sharing

4.1.2 PRACTICE INTERVENTION: SCALING UP PRINMAT PMTCT B+ SERVICE DELIVERY

As outlined above, SHOPS engaged with the PRINMAT network of ANC and maternity facilities in order to scale up their involvement in the delivery of an integrated ANC/PMTCT B+ service package in high-need community-based settings. SHOPS pursued this effort from the outset as a PPP involving PRINMAT, the MOHSW PMTCT section, and the PPP-TWG. The intervention was implemented in a phased approach that sought to adequately prepare the providers and their facilities, to thoughtfully introduce PMTCT B+ services at PRINMAT facilities, to utilize service data to guide implementation and scale-up, and to promote sustainability via strong public-private collaboration. The phases of implementation are outlined in Figure 3:

FIGURE 3: IMPLEMENTATION TIMELINE



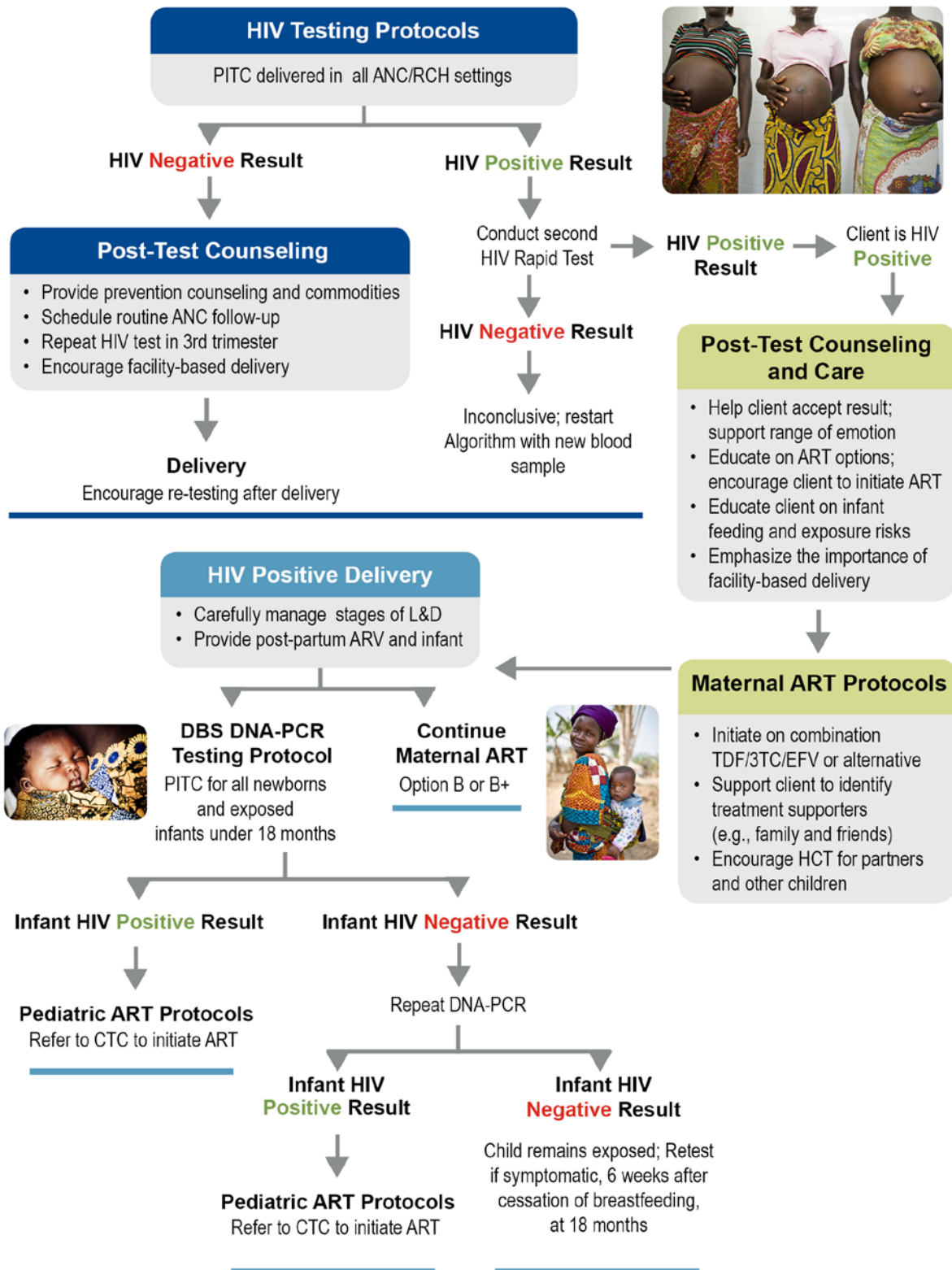
Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya (MTUHA) is the government's health information management system (HMIS).

Phase 1: Provider Readiness (January-March 2014)

Clinical Training in PMTCT B+

The intervention was initiated in early 2014 in close collaboration with the MOHSW PPP-TWG, and the PMTCT section of the RCH Unit under the MOHSW Directorate of Preventative Services (DPS), and nursing leadership. As the SHOPS PSA revealed, historically private sector nurses and midwives had been excluded and/or had trouble accessing nationally required PMTCT training, and were therefore limited in their ability to integrate HIV services into their ANC service package. As an early demonstration of strong public-private cooperation, the national MOHSW PMTCT section permitted PRINMAT's private providers to be the first cohort of nurses and midwives trained in their newly updated PMTCT B+ guidelines (2013). In January and February 2014, SHOPS worked with PRINMAT and the PMTCT section to identify target facilities and regions, and to determine the best locations for training PRINMAT providers. In February and early March 2014, SHOPS supported two PMTCT B+ clinical trainings, one in Dar es Salaam and one in Mwanza region, which ultimately certified 75 PRINMAT providers to deliver PMTCT B+ services in 53 separate facilities across the country. The training included both classroom-based theoretical learning and facility-based skills development related to the PMTCT B+ clinical cascade described in Figure 4.

FIGURE 4: TANZANIA PMTCT B+ TESTING, COUNSELING, AND TREATMENT ALGORITHM



Training in Tanzania's Health Management Information System (HMIS) and Data Reporting

In addition to supporting the clinical training delivered by the MOHSW PMTCT section, SHOPS also supported an additional two days of training focused on PRINMAT data collection and reporting to the national MTUHA⁸ data management system. This included working with the PRINMAT providers to practice filling out the government's paper-based HTC, PMTCT, and ART registers for facility-level data collection, and developing an internal PRINMAT reporting form that mirrored MTUHA PMTCT indicators that would be collated monthly at PRINMAT headquarters.

Notification of DMOs

In January and February 2014, prior to the SHOPS-sponsored trainings, the PRINMAT providers were asked to contact the DMO in their respective district, to notify them of the upcoming PMTCT section training, and to request that the PRINMAT facility be considered for immediate buffer stock⁹ and/or placed on the district forecast for PMTCT commodity procurement. This was to ensure that PRINMAT facilities would be provided with access to HIV (antibody) RDTs, DBS test kits for EID, and ARV medicines for mothers' combination ART and newborn Nevirapine (NVP) prophylaxis. In a few isolated cases, the district pharmacy provided commodities to the facility immediately, while in the majority of cases the DMOs asked that the providers return with their certificate of completion from the PMTCT section training.

Pre-Implementation Data Collection

Prior to the introduction of PMTCT B+ services at the 53 PRINMAT facilities, SHOPS carried out several pre-implementation monitoring activities to collect both quantitative and qualitative information. This consisted of collecting facility-level service data to establish a three-month pre-implementation baseline (January-March 2014) of ANC and PMTCT services provided at the 53 facilities. The approach also consisted of a descriptive quantitative questionnaire to reveal additional information about the facilities and their caseloads, and two pre-training FGDs with all 75 trainees to collect qualitative information and reveal provider concerns and perspectives around potential barriers and opportunities for roll-out. One FGD was carried out before the Dar es Salaam training in March 2014 and one before the Mwanza training in April 2014. The responses from the pre-training participant questionnaire combined with the findings from the pre-implementation FGDs provided additional information on the type of PRINMAT facilities participating in the SHOPS and PRINMAT PMTCT intervention. It also provided valuable insight into the training and experience of the SHOPS-trained PRINMAT providers prior to their endeavor to deliver integrated ANC / PMTCT B+ services, as discussed in chapter 3 of this report.

The overall goal of phase 1 was to solidify the partnership between PRINMAT facilities, the PMTCT section, and their local DMOs; and to address provider readiness to deliver the full spectrum of PMTCT B+ services.

Phase 2: Facility Readiness (March-May 2014)

Following the SHOPS-sponsored trainings, SHOPS and PRINMAT's national leadership collaborated to prepare the 53 targeted facilities for PMTCT B+ service introduction. This consisted of providing the facilities with necessary MOHSW approved data management and

⁸ Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya (MTUHA) is the governments' health information management system.

⁹ Buffer stock here refers to the PMTCT commodities the district medical stores department is directed to keep on hand in case of supply or demand variations, or forecasting errors at the facility level.

health information registers, and equipping them with PMTCT commodities (including HIV RDTs, DBS specimen collection kits, and ARVs).

HMIS and M&E Preparations

To prepare the facilities for their data reporting duty to both district health leadership and PRINMAT national headquarters, SHOPS printed government-approved MTUHA registers for ANC, child health, and maternal health/deliveries for the PRINMAT facilities. In addition, the PRINMAT national monitoring and evaluation (M&E) team and a senior Tanzania-based SHOPS M&E consultant provided ongoing data management training at individual facilities, and the PRINMAT internal monthly reporting form (based on baseline data collection tool and MTUHA indicators) was introduced to the PMTCT providing facilities. In addition, SHOPS consultants and the PRINMAT M&E team carried out quality assurance of randomly selected PRINMAT facilities in the two training regions, Dar es Salaam and Mwanza. Reported service data were verified in person in at least three facilities each month, and the reports were also confirmed via telephone for facilities located outside of Dar es Salaam and Mwanza.

PMTCT B+ Commodity Procurement

Having completed the training, the PRINMAT providers were able to present their PMTCT B+ training certificates to their respective DMOs in order to procure a public stock of HIV RDTs, DBS specimen collection kits, and fixed combination or constituent Tenofovir (TDF), Lamivudine (3TC), and Efavirenz (EFV) ARV medicines, as well as NVP syrup or tablets for substitutions and exposed-infant prophylaxis. Most DMOs or district pharmacists provided public buffer stock quickly, or at minimum included the PRINMAT facility on the next three-month procurement forecast. Several facilities that could not immediately obtain public stock were able to borrow or purchase HIV RDTs from nearby nonprofit organizations or private pharmacy outlets. Some facilities were also able to borrow DBS specimen collection kits and ARV medicines from other public or private facilities; however, these were much less available. PRINMAT national headquarters and SHOPS consultants stayed in close contact with the individual facilities throughout March, April, and May 2014, seeking to intervene where possible to ensure as many facilities as possible could formally introduce services on June 1, 2014.

Phase 3: Formal Introduction and Scale-Up of PRINMAT PMTCT B+ Services (June-August 2014)

Ongoing Service Monitoring and Data Collection

SHOPS monitored and collected service data from PRINMAT PMTCT-providing facilities for nine months, from June 1, 2014 through February 2015. The abbreviated PRINMAT PMTCT reporting form (consistent with MTUHA registers) was faxed from the 53 facilities to PRINMAT headquarters monthly, where the forms were compiled and shared with the SHOPS M&E consultant. The compiled data was also shared monthly with SHOPS M&E personnel at the project's Washington, DC, home office, where it was reviewed for areas of progress, trends, and persisting gaps. The SHOPS intervention was designed to be implemented in a phased approach and to utilize monthly service data to guide ongoing targeted technical assistance to the PRINMAT PMTCT facilities. As such, service data was formally reviewed in September 2014 after the first three months of data collection in (June-August 2014). That early information—specifically some observed regional gaps in commodity access and pace of service roll-out—was discussed at the second PMTCT PPP roundtable convened by SHOPS in July 2014.

The Second PMTCT PPP Roundtable

Although the introduction of PMTCT B+ services at PRINMAT facilities led to several promising early outcomes (as will be presented in chapter 5), initial M&E efforts revealed several facilities that were having difficulty accessing PMTCT commodities and were therefore delayed in rolling out services. To openly address this, SHOPS convened a roundtable discussion in Dar es Salaam in July 2014 that brought together several senior public and private partner representatives, including USAID, SHOPS, PRINMAT, leadership of the MOHSW PPP-TWG and the MOHSW PMTCT section, and several regional and district public nursing representatives. The purpose of the meeting was to reinforce and expand connections and relationships between public and private nurses, government health leadership, and the PRINMAT secretariat. The delay in commodity access, particularly in Mwanza region, was discussed, as was the need to continue quality strengthening and MTUHA reporting efforts at the facility level. The meeting determined the need for focused commodity access interventions at the district level, led by the MOHSW PMTCT section and involving PRINMAT and SHOPS to close gaps in PRINMAT's access to PMTCT commodities.

Phase 4: Intensified Commodity Procurement Efforts (September 2014-February 2015)

As outlined above, based on the first three months of reported data and the discussions held at the PMTCT PPP roundtable held in July 2014, in April 2014, the MOHSW and PMTCT section released an official directive confirming the MOHSW's partnership with PRINMAT and providing permission for DMOs to release PMTCT commodities to PRINMAT and other private facilities trained in PMTCT B+. The directive was disseminated to DMOs in all districts in the country through the regional medical officers and was sent electronically to all relevant DMOs by PRINMAT's national headquarters. In addition, SHOPS held discussions with individual DMOs in districts where implementation of PMTCT stalled to understand why commodity access was delayed, and representatives from PRINMAT headquarters and the PMTCT section travelled together to Mwanza region where providers were having a particularly difficult time with commodity access. All of the PPP partners sought to sensitize DMOs on the benefits of extending PMTCT B+ to PRINMAT facilities as part of meeting district health targets and forging lasting PPPs. These efforts received strong support from the various partners represented at the PMTCT PPP roundtable discussions, in particular the MOHSW PMTCT section. Finally, to track progress—and gaps—in PRINMAT access to commodities, and to reveal the source of commodities in facilities that had introduced services, SHOPS implemented a monthly commodity audit. The audit clearly revealed mixed success in commodity access among the 53 PRINMAT facilities, and identified several alternative supply sources that facilities were using during public stock-outs.

Phase 5: Close of Formal Monitoring Period and Review of Service Data (February-April 2015)

SHOPS concluded formal data collection at the end of February 2015, after nine months of PMTCT B+ service delivery at the SHOPS-trained PRINMAT sites. Data from the full monitoring period was evaluated to compile final service statistics, and was compared to the baseline data to reveal pre- and post-implementation changes. The commodity audit was also completed in February 2015 to compile data on the source and status of commodity access efforts. In addition, a post-implementation FGD was held with a selected group of PRINMAT trainees in Dar es Salaam in March 2015. The objective of the FGD was to learn about the providers' experiences and perspectives after introducing and delivering PMTCT services for several months. Finally, the implementation experience and final quantitative service data as presented in chapter 5 were used to inform and guide SHOPS' continued activities in Tanzania. This included a third SHOPS-sponsored PMTCT B+ training of 35 additional PRINMAT providers in March 2015 to extend PMTCT B+ services to the additional 22 facilities in the PRINMAT

network, ensuring that facilities across the entire PRINMAT network were equipped to deliver the service.

TABLE 2: SOURCE OF PRINMAT PMTCT B+ COMMODITIES (AS OF FEBRUARY 2015)

February 2015	Public Sector		Purchased or Borrowed		No Commodities	
	Number	%	Number	%	Number	%
HIV RDTs	43	81	15	28	2	4
DBS specimen collection kits	29	55	2	4	23	43
Combination ARVs for PMTCT	40	75	2	4	13	25

Note: Some facilities purchased/borrowed commodities and sourced commodities from the public sector in the same month. Therefore, rows neither add to 53 nor 100%.

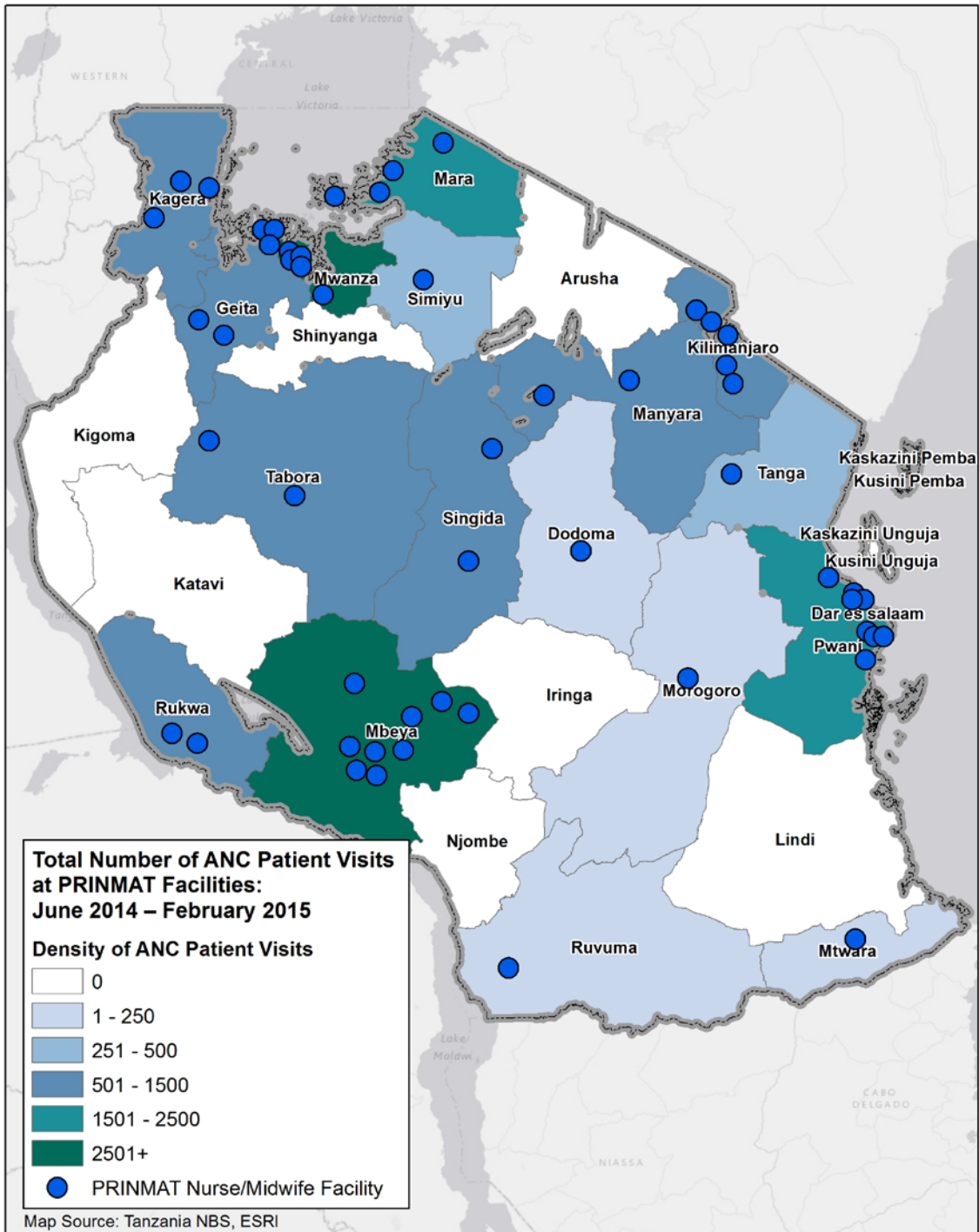
5 OUTCOMES AND FINDINGS

The service data and results below are presented along the PMTCT B+ cascade: from ANC to postpartum pediatric HIV testing and maternal ART administration as outlined in Figure 4 in the preceding chapter. The data was collected as per the phased quantitative and qualitative mixed-methodology outlined above, and cover the period of PRINMAT PMTCT B+ service delivery from June 1, 2014, through February 28, 2015.

5.1 ANC PATIENT VISITS AT PRINMAT FACILITIES

As depicted in Figure 5, PRINMAT facilities participating in the SHOPS intervention delivered ANC services in 18 of Tanzania's 30 regions. Mbeya and Mwanza had over 2,500 individual ANC patient visits during the nine-month implementation period; Dar es Salaam and Mara districts had over 1,500 visits during the same period.

FIGURE 5: GEOGRAPHIC DENSITY OF ANC PATIENT VISITS



5.2 AVERAGE HIV TESTING AND COUNSELING CASELOADS

Following the SHOPS intervention, the PRINMAT PMTCT-providing facilities reported an average ninefold increase in monthly HTC services (Table 3). At baseline (January-March 2014), the 53 participating facilities provided a combined average of 227 HTC services per month; this average rose steeply to 2,105 by the end of the SHOPS interventions (February 2015). In total, the PRINMAT PMTCT facilities provided 18,942 HTC services during the nine-month monitoring period.

TABLE 3: MONTHLY AVERAGE HTC CASELOADS AT PRINMAT FACILITIES

	Pre-SHOPS Intervention ^a	Post-SHOPS Intervention ^b	Average X-Fold Increase
Total number of HTC services provided (per month)	227	2,105	9
HTC services for men	52	483	9
HTC services for non-pregnant women	123	778	6
HTC services for pregnant women at ANC ^c	52	780	15
HTC services for pregnant women at L&D ^d	0	65	-
Total number of referrals-out for HTC (per month)	14	272	19
Referrals-out for men	0	27	-
Referrals-out for non-pregnant women	0	44	-
Referrals-out for pregnant women	14	201	14
^a Pre-SHOPS averages calculated based on monthly data January-March 2014 ^b Post-SHOPS averages calculated based on monthly data June 2014-February 2015 ^c Pregnant women who presented to the antenatal clinic for any of the four WHO-recommended ANC visits ^d Pregnant women who are tested as new patients during active L&D			

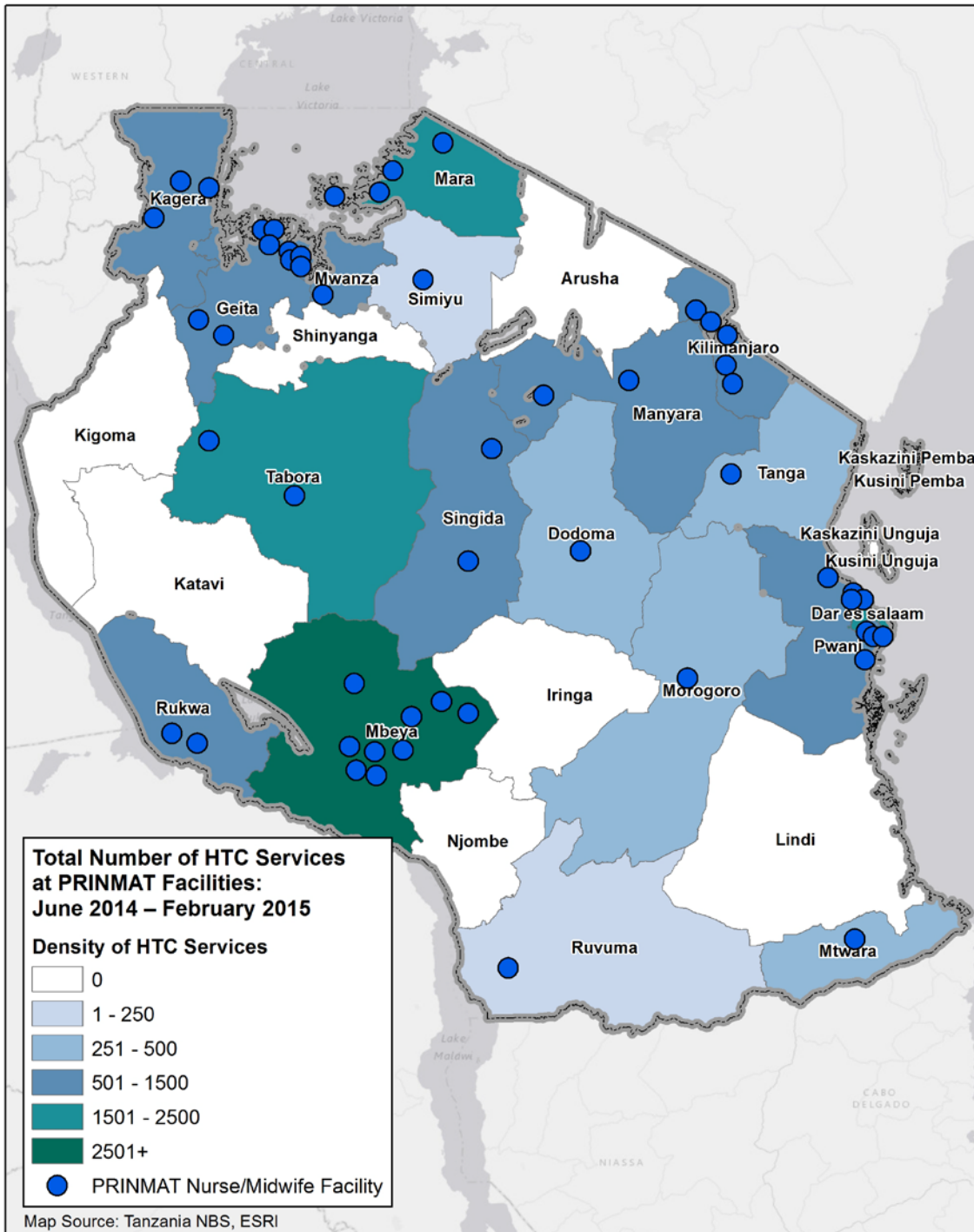
Figure 6 shows the monthly trend of HTC services before and after the SHOPS interventions. Monthly HTC services increased sharply and maintained a relatively steady rise over the monitoring period.

FIGURE 6: HTC SERVICES PROVIDED AT PRINMAT FACILITIES

SHOPS-sponsored interventions

As Figure 7 illustrates, the highest number of HTC services was provided in Mbeya region, where nine PRINMAT facilities were able to access public commodities and start implementing the service quickly. Also of note, Tabora and Mara regions both provided over 1,500 HTC interventions during the implementation period, despite there being only four PRINMAT facilities in Mara and only two in Tabora. Mwanza region in particular faced commodity access challenges, which limited their provision of HTC and other PMTCT services despite the nine PRINMAT facilities being trained to provide the services.

FIGURE 7: DENSITY OF PRINMAT HTC SERVICES PROVIDED BY REGION



5.2.1 HTC PROVIDED TO PREGNANT WOMEN DURING ANC AND L&D

The facilities in the PRINMAT network attend to a significant number of new and returning ANC clients each month. Over the nine-month monitoring period, ANC attendance remained relatively stable, averaging 863 new ANC visits and 1,480 returning ANC visits per month across the 53 facilities. Prior to the SHOPS interventions, only about 52 HTC services were administered to pregnant women during ANC visits each month at all 53 facilities. Following the SHOPS intervention, HTC service provision during ANC visits increased 15-fold to an average of 780 per month (Table 3, in section 5.2), and overall, PRINMAT facilities provided a total of 7,017 HIV tests to pregnant women (Table 4). In the monitoring period, 4.3 percent of women tested during ANC visits received a positive result.

TABLE 4: HTC TEST RESULT BY COHORT

	ANC	L&D
Total HTC services provided	7,017	582
Positive result (%)	4.3	6.5
*Numbers reflect total services and results delivered over the nine-month post-intervention monitoring period.		

A number of pregnant women present to PRINMAT facilities during active L&D. L&D volumes were high among the 53 PRINMAT PMTCT facilities and remained stable at about 659 deliveries per month during the monitoring period. A total of 582 HTC services were delivered to pregnant women during active L&D, an average of 65 women in L&D tested each month. This is compared to no HTC services administered at L&D reported during the pre-intervention baseline (Table 3). During the nine-month monitoring period, 6.5 percent of women tested during L&D received a positive result.

5.2.2 HTC PROVIDED TO MEN AND NON-PREGNANT WOMEN

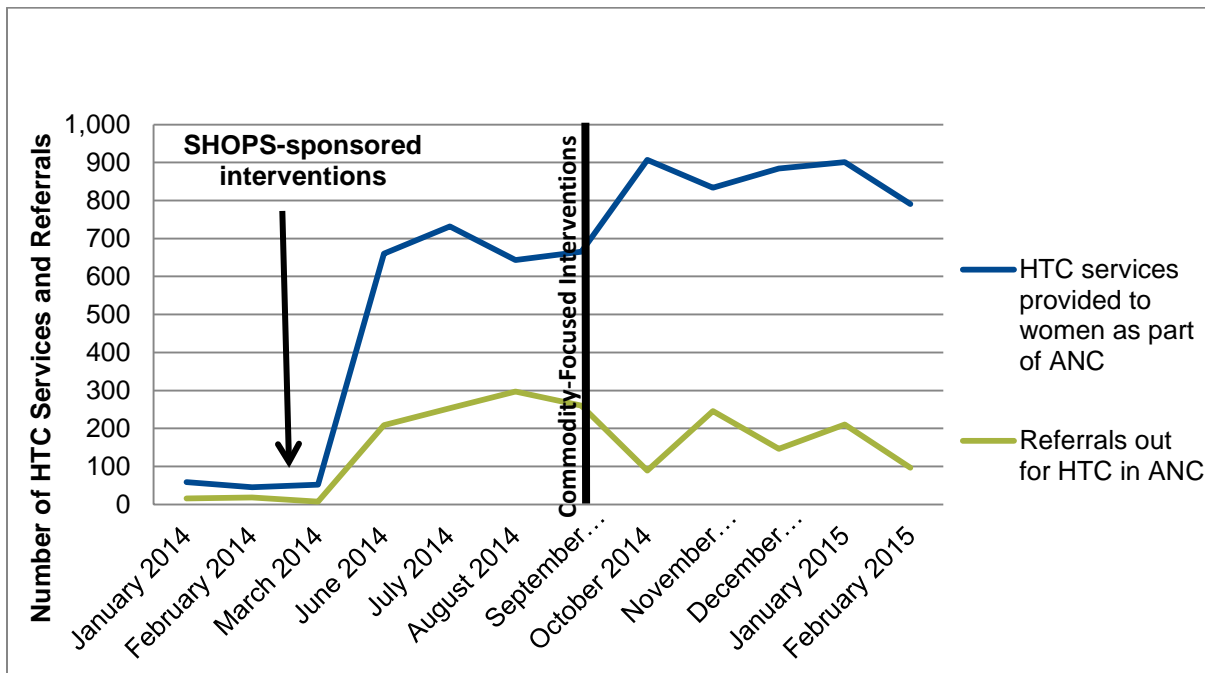
As was shown in Table 3 (see section 5.2), HTC services delivered to men and non-pregnant women increased nine- and six-fold, respectively, following the SHOPS intervention. At baseline, the 53 facilities delivered a combined monthly average of 52 HTC services to men; this increased to a monthly average of 483 HTC services. These numbers represent HTC services delivered to men who accompanied their wives and partners to PMTCT B+ services, and to those who independently came to the PRINMAT facility for HTC. Similarly, the HTC services provided to non-pregnant women increased from a monthly average of 123 HTC services to 778 across the 53 facilities.

In total, the PRINMAT PMTCT-equipped facilities provided 4,344 HTC services to men and 6,999 HTC services to non-pregnant women in the monitoring period. Of those tested, 5.5 percent of men and 5.8 percent of non-pregnant women received a positive result.

5.2.3 PRINMAT REFERRAL-OUT FOR HTC

In addition to the remarkable increase in the total volume of HTC services provided following the SHOPS-sponsored training and facility preparations, it was also observed that PRINMAT-initiated referrals-out for HTC also increased—during the nine-month monitoring period, PRINMAT referred 2,454 patients (1,807 pregnant women, 247 men, and 400 non-pregnant women) to receive HTC services elsewhere. As will be discussed further in chapter 6, this was suspected to be the result of overwhelming demand for services and/or commodity stock-outs at some of the facilities.

FIGURE 8: HTC DURING ANC AND HTC REFERRALS AT PRINMAT FACILITIES



During the nine month monitoring period PRINMAT referred a total of 2454 patients (1807 pregnant women, 247 men, and 400 non-pregnant women) to receive HTC services elsewhere (Figure 8). As shown in Figure 8, in September-November 2014, there was a slight decrease in the number of total HTC services provided at the 53 facilities, which coincided with comparable increases in referrals-out for HTC, again likely the result of periodic HIV RDT commodity stock-outs at some PRINMAT facilities.

The downturn in total HTC service provision was related to PRINMAT shortages of HIV RDTs due to government stock-outs and short supply. Following a SHOPS, MOHSW, and PRINMAT intervention to increase supply, HTC services provided at PRINMAT facilities rose to approximately 900 per month at the 53 facilities, with a concordant decrease in referrals-out for HTC from a referral rate of 38 percent before the commodities intervention, to 18 percent afterwards.

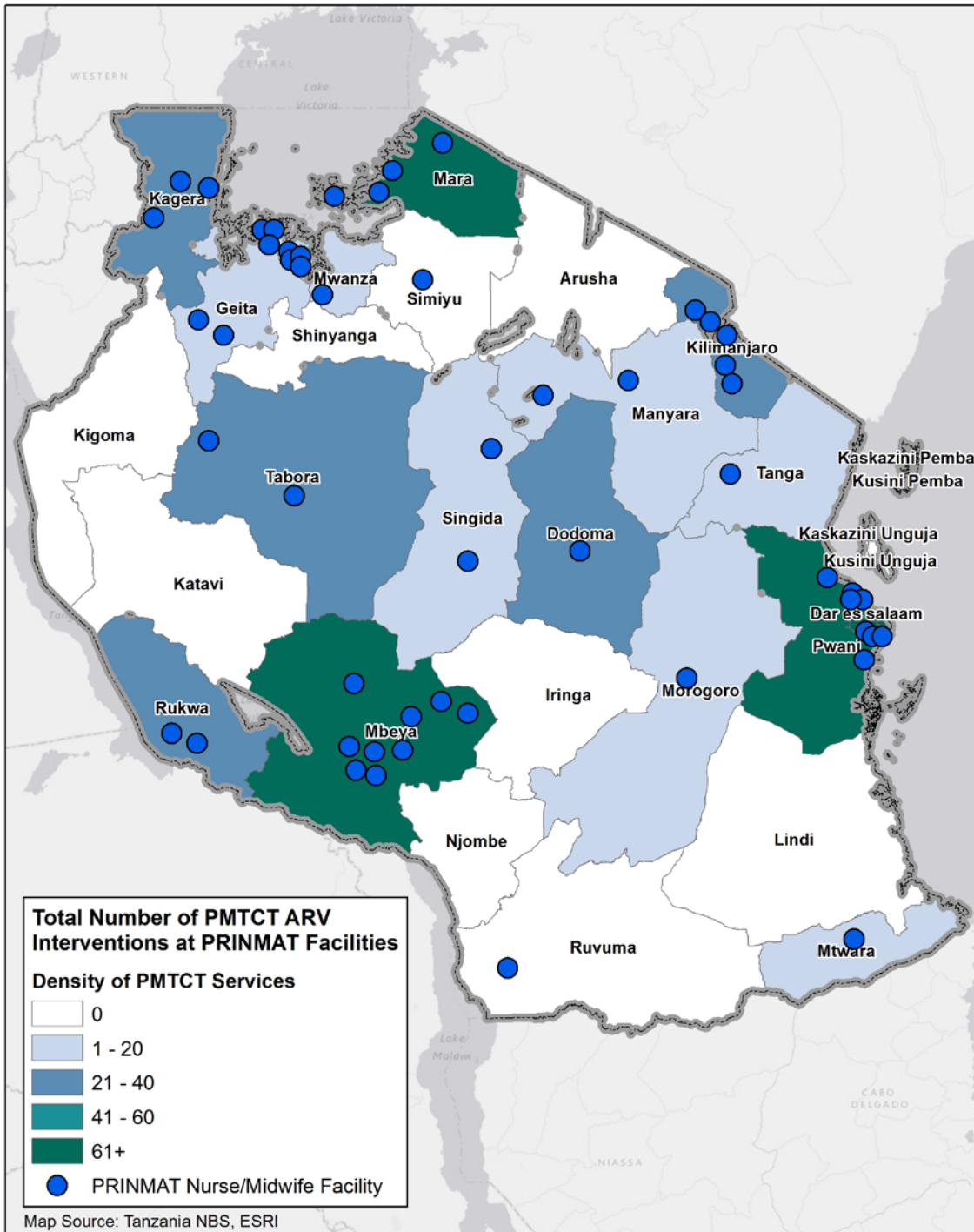
In short, referrals-out for HTC increased as demand for services exceeded the capacity of some PRINMAT facilities to deliver, especially during periods of commodity stock-outs; referrals declined once commodities were made available and the facilities could roll-out services.

5.3 PMTCT ANTIRETROVIRAL INTERVENTIONS

As per the PMTCT B+ clinical cascade outlined in chapter 3, HIV-positive pregnant women are initiated on lifelong combination ART irrespective of their CD4 count, immediately after diagnosis. As per Tanzania guidelines, Nevirapine ARV prophylaxis is also provided to newborn HIV-exposed infants during their first several weeks of life and during breastfeeding.

As seen in Figure 9, the highest numbers of ARV interventions delivered by SHOPS-trained PRINMAT facilities were provided in Mbeya and Dar es Salaam regions. There, many of the facilities had previous relationships with government to deliver immunization services and this facilitated rapid ARV commodity access from district medical stores. Again, Mwanza was the region with the most difficulty in rolling out ARV services, with only five of the nine PRINMAT clinics commodities having ARVs available five months after the June 1 roll-out.

FIGURE 9: DENSITY OF PRINMAT ARV INTERVENTIONS BY REGION



5.3.1 ART INITIATION AMONG HIV-POSITIVE PREGNANT WOMEN

During the nine-month post-SHOPS intervention monitoring period, a total of 536 HIV-positive pregnant women attended ANC or presented to PRINMAT facilities during active L&D, an average of 60 per month (Table 5). This included 337 women diagnosed with HIV at PRINMAT facilities, and 199 women who arrived at PRINMAT with a known HIV-positive status. Of the 536, 59 percent were initiated on ART as part of integrated ANC/ PMTCT B+ services; and an additional 17 percent were referred out to initiate ART elsewhere—as explained in section 5.2.3, largely due to stock-outs of ARVs. The remaining 24 percent of HIV-positive clients were considered lost to follow-up after missing two sequential visits. Prior to the SHOPS interventions, none of the 199 HIV-positive women who presented for ANC care at PRINMAT with a known HIV-positive status was initiated on ARVs, since the facilities were not equipped to provide the service.

Of the total 38 HIV-positive women who presented for the first time to PRINMAT during active L&D, 35 were initiated on ART at delivery as per PMTCT B+ protocols. The three additional women were referred immediately after delivery to initiate ART elsewhere.

FIGURE 10: ART INITIATION DURING ANC AND L&D AT PRINMAT FACILITIES

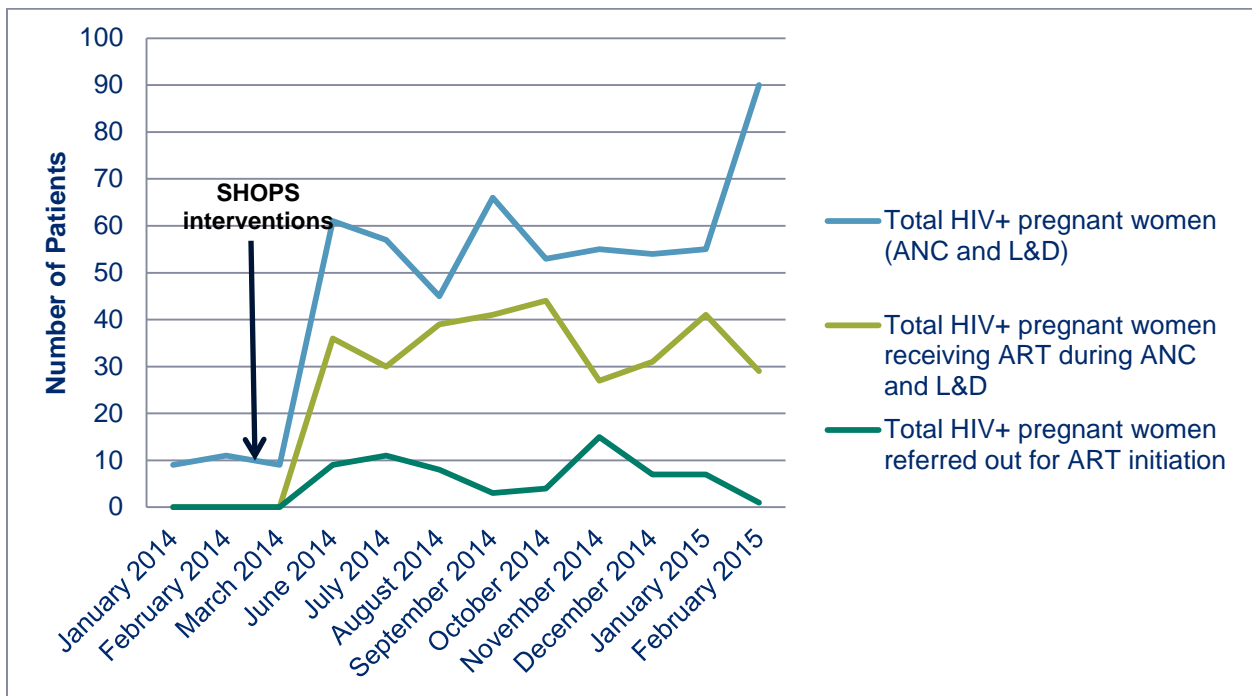


TABLE 5: MONTHLY AVERAGE PMTCT B+ INTERVENTIONS PROVIDED AT PRINMAT FACILITIES

	Pre-SHOPS Intervention ^a	Post-SHOPS Intervention ^b	Average X-Fold Increase
Number of known HIV+ pregnant women presenting to ANC (per month)	10	55	6
Number of HIV+ pregnant women initiated on ART during ANC ^c (per month)	0	31	-
Number of known HIV+ women presenting for L&D ^d (per month)	0	4	-
Number of HIV+ women initiated on ART during at L&D (per month)	0	4	-
Number of infants born to known HIV+ mothers (HIV+ deliveries) (per month)	3	17	6
Number of infants born to HIV+ mothers initiated on NVP (per month)	0	14	-
EID: Number of infants provided with DBS DNA-PCR testing (per month)	0	5	-
^a Pre-SHOPS averages calculated based on monthly data January-March 2014 ^b Post-SHOPS averages calculated based on monthly data June 2014-February 2015 ^c Pregnant women who presented to the antenatal clinic for any of the four WHO-recommended ANC visits ^d Pregnant women who are tested as <u>new patients</u> during active L&D			

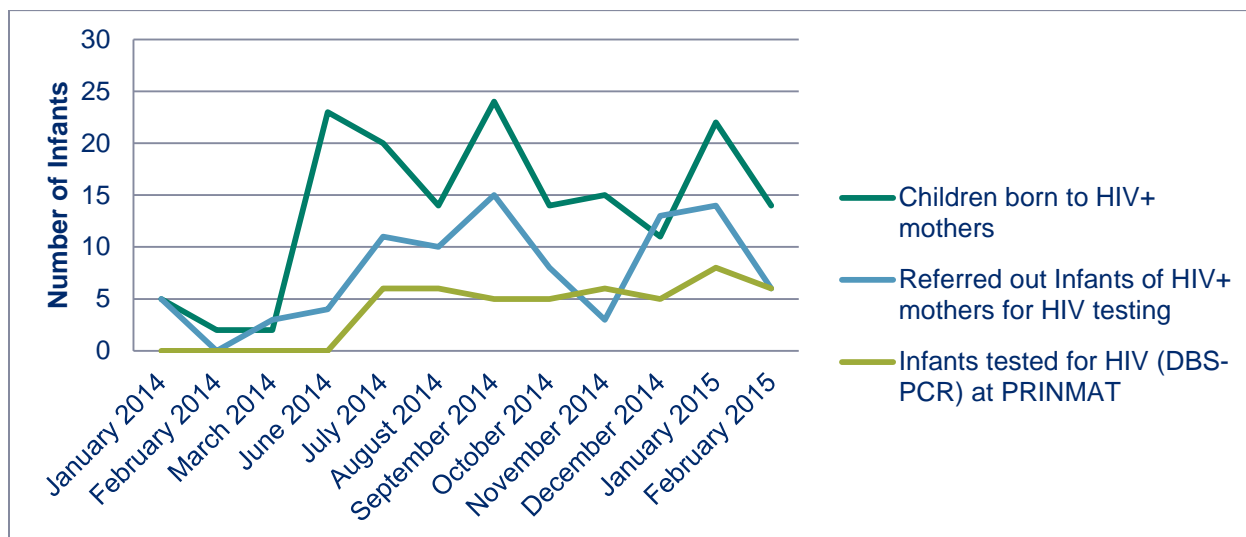
5.3.2 NVP PROPHYLAXIS AMONG CHILDREN BORN TO HIV-POSITIVE MOTHERS AT PRINMAT

During the monitoring period, 157 HIV-exposed newborns were born at the PRINMAT facilities to HIV-positive mothers, an average of 17 HIV-positive deliveries per month (see Table 5 in preceding section) compared to an average of three HIV-positive deliveries per month during the pre-implementation baseline period. Prior to the SHOPS intervention, no HIV-exposed newborn born to HIV-positive mothers at PRINMAT prior to the intervention received NVP prophylaxis since PRINMAT was forced to refer HIV-exposed infants to PMTCT B+/ART providing facilities. After the SHOPS interventions and introduction of PMTCT B+ at PRINMAT, a total of 130 HIV-exposed newborns born at PRINMAT—an average of 14 per month— were initiated at birth on short-course NVP prophylaxis as per PMTCT B+ protocols.

5.4 EARLY INFANT DIAGNOSIS OUTCOMES

According to Tanzania’s national PMTCT B+ guidelines, all HIV-exposed infants born to HIV-positive mothers are to have an HIV test administered no later than 4-6 weeks after birth using the DBS DNA-PCR method, and, if negative, tested again if symptomatic of HIV, at 18 months of age or six weeks after cessation of breastfeeding. If the child is then found to be HIV positive, he/she should be initiated on pediatric ART as per national protocols. Before the SHOPS interventions, PRINMAT facilities were not equipped to collect DBS samples and therefore no infants were tested for HIV during the pre-intervention baseline. As shown in Figure 11, after the roll-out of PMTCT B+, 47 HIV-exposed infants received a DBS DNA-PCR test at the 53 PRINMAT facilities; due to a shortage of DBS collection kits at some PRINMAT facilities, an additional 84 infants were referred out for DNA-PCR. The discrepancy in the number of HIV-exposed infants born to HIV-positive mothers at PRINMAT and the number of infants who received a NVP or EID intervention suggests that PRINMAT also serves as a referral point for HIV-positive women and their children who visit PRINMAT facilities for HIV-related services after delivering elsewhere.

FIGURE 11: EID AT PRINMAT FACILITIES



Of the 47 DNA-PCR tests administered at the 53 PRINMAT facilities, five infants (10.6 percent) were confirmed HIV positive (Table 6). This compares to a vertical MTCT rate of 15-40 percent if no PMTCT intervention was delivered (Tanzania Ministry of Health and Social Welfare, n.d.). In addition, 10 infants (who were not born as part of the cohort monitored during the SHOPS intervention) received an antibody-based HIV RDT at a PRINMAT facility (administered at or after 18 months). Two of those infants (20 percent) were found to be positive. All of these confirmed infants with HIV-positive status were subsequently referred out to initiate pediatric ART since PRINMAT does not currently provide that service.

TABLE 6: INFANT HIV TESTING AND OUTCOMES

Test and Outcome	Number (%)
Total EID (DBS DNA-PCR) tests performed	47
Total HIV (antibody) RDTs performed	10
Positive result	7 (12.2%)
Negative result	50 (87.8%)
*Numbers reflect total services and results delivered over the nine-month post-intervention monitoring period	

EID Outcomes Post-Cessation of Breastfeeding

TZ PMTCT B+ guidelines recommend HIV-positive mothers exclusively breastfeed for the first six months of life with the infant receiving NVP prophylaxis for six weeks. Due to the length of the monitoring period, none of the 42 HIV-exposed infants born at PRINMAT who tested DNA-PCR negative were yet weaned from breastfeeding and therefore had not received a second/post-cessation DBS DNA-PCR. Breastfeeding infants born during the SHOPS monitoring period will be re-tested at 18 months or six weeks after breastfeeding cessation as per protocol.

To summarize the findings discussed above, the main service delivery outcomes found during the nine-month post-intervention monitoring period, following the SHOPS PMTCT B+ interventions there was a 15-fold increase in total HTC services provided at antenatal, labor,

and delivery care with 4.3 percent and 6.5 percent of women testing positive at ANC and during delivery, respectively. Of these, 59 percent were initiated on ART as part of integrated ANC/ PMTCT B+ services—with moderate levels of referrals-out (17 percent), largely due to stock-outs of ARVs. This contrasts with the period prior to the SHOPS interventions, when none of the known HIV-positive women who presented for ANC care at the PRINMAT facilities was initiated on ART. Following the introduction of PMTCT B+ at the 53 facilities, a total of 157 HIV-exposed newborns were born to HIV-positive mothers, of which 88 percent were initiated at birth on short-course NVP prophylaxis as per PMTCT B+ protocols. Twelve percent of infants tested HIV positive after birth and a significant number were referred out of the PRINMAT facilities for DBS DNA-PCR testing.

5.5 PRINMAT PROVIDER EXPERIENCES IMPLEMENTING PMTCT B+

In March 2015, following the nine-month implementation period, a group of PRINMAT providers were brought together for an FGD in Dar es Salaam to provide their experiences and perspectives on the introduction of PMTCT B+ services. Generally, the participants reported that the national training provided useful information and was helpful, that they would recommend it to other providers, and that they had subsequently been able to share their knowledge with other staff at the facility as services were introduced.

Several key themes emerged during the post-implementation FGD:

i) Impact on Referrals-into PRINMAT Network

Several respondents reported that the introduction of PMTCT B+ services had a positive impact on their practice. Several reported having receiving a larger volume of referrals from non-PMTCT-providing facilities, and a perceived increase in demand generally, including among the key groups of youth and couples. Respondents further reported that their ability to provide PMTCT and limit referrals enhanced the view that they are providing quality care and friendly services.

ii) Persisting Public-Private Tension

Several participants in the pre-implementation FGDs voiced a concern that historical hostilities with the government, especially at the local level, would limit support for PRINMAT and make the introduction of PMTCT B+ services difficult. Based on responses from some participants in the post-implementation FGDs those concerns appear to have been borne out in at least some of the PRINMAT facilities. Respondents reported barriers caused by district health leadership, including government staff reclaiming commodities when they visited facilities, refusing to certify the PRINMAT facility to procure public vaccines or PMTCT commodities, and limited supportive supervision during the process.

It must be noted that the post-implementation FGDs included only a small group of providers based in and around Dar es Salaam, and as data from the SHOPS commodity audit demonstrates, most PRINMAT facilities were able to create new relationships or build upon existing links with their local DMOs. As the quote below demonstrates, building some of those new public-private relationships was a challenge:

“I am sad because I was so motivated after the training but after visiting the DMO’s office I faced a lengthy process [to receive commodities and district-level permission to introduce services]. Sometimes I had to repeat the same steps. It took so long, but eventually they visited the facility

and instructed me on the changes that I had to make, and I did. Still the response was slow. I thank PRINMAT officers for helping me to follow up.” – Dar es Salaam trainee

iii) Mixed Access to Commodities

Although 55% of clinics had the full spectrum of PMTCT commodities on hand by the end of February 2015, in several clinics, introduction and ongoing implementation of PMTCT B+ services was complicated by delayed or irregular commodity access. The PRINMAT facilities’ ability to obtain the HIV RDTs, DBS specimen collection kits, and ARVs varied. Respondents from 25 facilities reported having to buy their own HIV RDT kits and having to cover those costs through their general revenue in both the short and long term. Others reported going without some or all publicly provided PMTCT commodities during at least some of the implementation period.

iv) Meeting Demand for PMTCT B+ Services

Another widely mentioned challenge was staffing and meeting demand, which has led to PRINMAT PMTCT B+ facilities staying open late or opening on weekends. Concerns over their ability to meet the existing demand for PMTCT services was identified in the pre-training FGD, during which participants were unsure of how they would be able to handle increased caseloads.

“Due to shortage of staff, when the mother comes, I have to integrate all the services at one time and in the same station. If found positive, I have to make an appointment so that I get enough time with them. But currently everything is done at the reception table. Including testing.” (Dar es Salaam trainee)

v) The Need for Ongoing Support and Health System Intervention

Respondents expressed a need for further intervention and support to PRINMAT in securing commodities and other supplies, in strengthening HMIS reporting and communication, and additional training to solidify their PMTCT skills. In particular, providers stated that facilitating communication and coordination with DMOs (in both supportive and non-supportive locations) is another area where support would be helpful. In particular, providers said that additional assistance navigating the process of becoming a certified district or council facility was needed.

Overall, providers at the post-implementation FGD reported that they had found the training useful and demand for and provision of PMTCT services had greatly increased at their facilities following the intervention. Challenges—such as persisting tensions between private PRINMAT providers and some DMOs, delayed access to commodities, and some facilities’ struggle to keep up with demand—were all areas where providers felt more support was needed.

6 DISCUSSION

The Private Health Sector Can Be a Powerful Source of PMTCT B+ Services

As the results of the SHOPS and PRINMAT PMTCT B+ service delivery effort demonstrate, private sector nurses and midwives can be a powerful and immediate source of PMTCT service provision. The intervention quickly increased the number of Tanzanian health care professionals trained to deliver PMTCT B+ services, extended PMTCT service coverage to 53 additional facilities across 32 districts in 18 regions, and promoted equitable and accessible to services in poor and underserved settings. Over the nine-month SHOPS monitoring period (June 2014 through end of February 2015) the 53 PRINMAT facilities quickly and significantly scaled up their delivery of HTC, maternal ART, and EID as part of an integrated ANC/PMTCT B+ service package. The scale-up of HTC services was particularly noteworthy, with PRINMAT providers delivering a total of 18,942 HTC services over the monitoring period, a total average increase from 227 HIV tests conducted per month to over 2,104 HIV tests conducted per month at the PRINMAT PMTCT B+ facilities.

The average monthly HTC caseload for pregnant women also increased dramatically, with 780 HTC interventions delivered to pregnant women per month after the intervention representing a 15-fold increase over baseline. In addition, the PRINMAT facilities initiated 318 pregnant women on ART during the monitoring period, delivered 38 HIV-positive deliveries, and carried out early infant diagnosis (EID) DBS DNA-PCR testing on 47 HIV-exposed newborns. By integrating PMTCT B+ with existing private sector ANC services, the intervention was effectively able to reach pregnant women with HTC, to immediately initiate ART among those testing positive, and to follow those pregnancies through delivery and EID. The intervention also demonstrated that delivering PMTCT B+ via community-based points of care can yield HTC attendance among other key groups, such as male partners and non-pregnant young women. In addition to these service delivery gains, PRINMAT providers reported that they felt more empowered to meet the full spectrum of their patients' needs, and patients reported that receiving PRINMAT PMTCT services had been a safe and positive experience.

Sabiha's Story: PRINMAT PMTCT B+ from the Patient's Perspective

Sabiha is a 38-year-old women with five children, the youngest a five-month-old newborn born in January 2015 at a PRINMAT facility near Dar es Salaam. Sabiha sought ANC at PRINMAT in June 2014, shortly after the formal introduction of PMTCT B+ services. At that visit, both she and her husband were administered a confidential HIV test, with Sabiha testing positive and her husband testing negative. PRINMAT nurses provided immediate post-test counselling to the family, which Sabiha stated was an important part of her experience:

"At first I was shocked and angry. Then after a few moments I began to be afraid of how I was going to live, fear of isolation by my family and friends, and above all fear that my husband will leave me....here [at PRINMAT] I was given emotional support when I received the bad news that I am HIV-positive. The nurse helped me and my husband calm down, and he was counselled to continue accepting me even though his test was HIV negative." – Sabiha (PRINMAT patient)

Sabiha was then initiated on ART at the PRINMAT facility, and she stated that the nurses counselled her and "...finally convinced her that even the unborn child could be delivered HIV free if she began taking the PMTCT drugs." In January, after seven months taking ARV medication and being monitored at PRINMAT ANC services, Sabiha delivered a healthy baby boy. She felt the L&D experience at PRINMAT was also positive compared to her previous deliveries at public facilities:

"Here [at PRINMAT] the delivery services are very different from [a nearby public health facility] where I delivered my first four children. Here you have a personal bed, at [the public facility] sometimes two women have to share a bed, or some women sleep on the floor with their babies. You know, there are so many women giving birth at the same time in the [public facilities] and the few nurses have to attend to each one. Here you are alone, being attended by two nurses and some assistants—it is very different." – Sabiha

She also referenced the free and confidential PMTCT B+ services provided to her at PRINMAT as part of private ANC services:

"Here [at the PRINMAT facility], the services are so good. The little fees we pay are affordable and we do not have to pay for the PMTCT service or antiretroviral drugs—those are all free and confidential so that even the other women attending the clinic do not know you have come to collect your medicine. I feel so good knowing that not many people are aware of my [HIV] status" – Sabiha

As counselled by the PRINMAT nurse, Sabiha continued her ART following the delivery and brought her baby to PRINMAT at six weeks of age to receive a DBS HIV test. The initial DNA-PCR results for her baby were negative. Sabiha described being "overjoyed" with her baby's result, and is continuing ART at PRINMAT to protect her baby through the remainder of breastfeeding, and to protect her own health moving forward.

Existing Public-Private Relationships at the District Level Facilitated the Integration of Private ANC and PMTCT B+ Services

As described in chapter 2, prior to the SHOPS intervention only a few PRINMAT facilities had commodity procurement relationships with their local DHMT and DMOs, and only 12 percent of the providers had ever been involved in council's annual planning process. Prior to the intervention, PRINMAT facilities that had experience working with their local councils were confident that these relationships would support the implementation of PMTCT B+, which held true at the majority of PRINMAT facilities with those existing public-private relationships. However, several facilities reported having difficulty accessing public PMTCT commodities due to either hostility from public health officials, delayed or insufficient public commodity procurements, or lengthy waits for facility inspections and other regulatory requirements. Because many PRINMAT facilities had previously delivered immunizations and other public health commodities for maternal health, they had already fulfilled any district-level regulatory requirements, facility inspections, and were already approved to receive public commodities at the district level. Facilities that did not have this relationship were significantly delayed in rolling out services, and after nine months of implementation 13 of the 53 facilities were still not receiving any PMTCT commodities from their district medical stores department.

Increased PRINMAT Referrals (In and Out) Highlight the Need for Strong Public-Private Coordination

At baseline, the 53 PRINMAT facilities reported referring 14 of their patients to other public or private HTC and PMTCT providing facilities every month, which rose to 272 HIV-related referrals per month after the SHOPS intervention. All of the facilities saw an increase in their total ANC and HTC caseloads after the introduction of PMTCT B+ services, including nearly 200 women who arrived at PRINMAT facilities with a known HIV-positive status via provider- or patient-initiated referral. Also, the discrepancy between the number of HIV-positive deliveries that occurred at PRINMAT and the higher number of infants who received a NVP or EID intervention during the monitoring period further suggests that PRINMAT facilities were serving as a referral point for some HIV-positive women and their newborns who had come to receive a PMTCT intervention after delivering elsewhere. This increase in total patient volumes following the introduction of PMTCT B+ led to an increase in both the total number of PMCT B+ interventions being provided at PRINMAT facilities, but also the number of total referrals-out for HTC, maternal ART, or EID across the network.

Delays or interruptions in commodity access also contributed to intermittent increases in referrals-out from PRINMAT facilities. Although almost all facilities were able to provide HTC services throughout the monitoring period, several facilities had short-term stock-outs of ARVs and DBS test kits, which necessitated continued referral of HIV-positive pregnant mothers and HIV-exposed infants to other public or private HIV service points. For instance, over the first three months of implementation, PRINMAT facilities still referred about 38 percent of their clients to other facilities for HTC services; this fell to 18 percent after district-level interventions led by the PMTCT section, PRINMAT and SHOPS. Also, over the nine-month monitoring period, 17 percent of HIV-positive women were referred out from PRINMAT to initiate ART elsewhere, largely the result of ongoing public sector ARV stock-outs. Post-implementation, some PRINMAT providers highlighted how the availability of PMTCT services also triggered attendance to HTC and PHC services by other groups, which led to an increase in referrals-out due to PRINMAT's desire to meet the increased demand but also maintain the quality of services for their core patient group of pregnant ANC clients.

As the above demonstrates, although introducing PMTCT B+ in private facilities can significantly increase private sector HTC and PMTCT caseloads, private facilities still require strong referral and coordination relationships with nearby public health facilities. Effective referral and coordination to public points of care will be an important part of any private sector PMTCT effort—to respond to overwhelming demand, to manage complex cases, or to address patient needs during period of commodity shortages.

Introduction of HIV Interventions in the Private Sector Involves Multiple Health System Areas

As outlined above, the SHOPS PMTCT B+ intervention involved the coordination and participation of multiple public and private health stakeholders, and technical interventions that touched on several health system building blocks. Specifically, the SHOPS PMTCT B+ effort included a policy and regulatory component implementing the scope of practice with the CNO's office and the TNMC, a focus on strengthening the PMTCT commodity supply chain to PRINMAT facilities, an effort to strengthen and facilitate PRINMAT's reporting to government by utilizing consistent MTUHA data registers, and a rapid scale-up of PRINMAT providers trained in PMTCT B+ to address human resource shortages for this service. At the national level, SHOPS worked to strengthen the relationship between PRINMAT and Tanzania's national MOHSW and nursing leadership. This was strongly facilitated by the PRINMAT facilities having representation from PRINMAT's national headquarters and leadership. As such, developing the capacity of similar private networks and umbrella coordinating bodies will undoubtedly strengthen efforts to introduce PMTCT B+ in the private sector by promoting national-level advocacy and joint planning.

At the local level, the SHOPS PMTCT B+ intervention involved strengthening PRINMAT's reporting and coordination with local DHMTs, ensuring the individual facilities were included in the district's public commodities forecasting, and that local health leadership included PRINMAT providers in their district human resource and service delivery planning process. Although a large component of the intervention involved training the PRINMAT providers and preparing their facilities to roll out services, the introduction of PMTCT B+ at PRINMAT required significant intervention by SHOPS and its partners in other health system areas. This underscores the importance of designing private sector PMTCT interventions that acknowledge and appropriately address the need for effective coordination and collaboration within the larger health system.

Variable Commodity Access Dictated PRINMAT Facility Success Implementing PMTCT B+

Introducing and sustaining the introduction of new health services requires a consistent and adequate supply chain for all necessary commodity inputs. Variable access to PMTCT commodities was by far the greatest challenge faced by many of the PRINMAT facilities seeking to roll out PMTCT services. Although many facilities had no difficulty procuring public HIV test kits, DBS specimen collection kits, and combination ARVs for maternal ART, in several facilities the introduction and ongoing delivery of PMTCT B+ services was complicated by delayed or irregular access to these necessary inputs. Downturns in the total number of HTC services provided over the nine-month monitoring period were largely related to PRINMAT reported shortages of HIV RDTs due to government stock-outs and short supply at the district level. Following early reports of commodity access challenges at several PRINMAT facilities, SHOPS' intervention with DMOs at the district level revealed larger challenges with the government's PMTCT commodity procurement and distribution system. In particular, at the national-level PMTCT commodities are allocated equally among the regions irrespective of population, HIV prevalence, ART burden, or coverage gaps. Investigations by PRINMAT, the PMTCT section, and SHOPS determined that commodity challenges in Mwanza were not unique to PRINMAT facilities, but were indeed affecting all health facilities in the region—a result of the Mwanza zonal medical stores department not receiving a sufficient share of nationally procured commodities to serve the region's population.

In response to these commodity access challenges, SHOPS implemented a commodity audit to track the availability and source of PMTCT commodities at PRINMAT facilities, and utilized that information to target district-level interventions with public health leadership in problem regions

and districts. The commodity audit immediately highlighted mixed success among the 53 PRINMAT facilities in accessing the three aforementioned PMTCT B+ commodities, and importantly revealed several alternative supply sources that providers and facilities utilized during public stock-outs. This included purchasing HIV RDTs from private sources, or borrowing HIV RDTs, DBS specimen collection kits, and ARVs when available at nearby health facilities.

Following SHOPS' intensified and ongoing advocacy efforts for PRINMAT commodity access, the supply of PMTCT commodities improved; however, early implementation challenges highlight the importance of consistent commodity supply in any private PMTCT effort. In particular, because national law prohibits PRINMAT facilities from purchasing ARVs, the facilities were forced to refer pregnant women and HIV-exposed infants to other centers during commodity stock-outs. Had all 53 PRINMAT facilities had access to PMTCT commodities from the outset and consistently through the monitoring period, the network could have provided an HTC intervention to an additional 1,807 pregnant women and retained an additional 90 women and 93 HIV-exposed infants at PRINMAT's community-based points of care.

Increasing Patient Volumes for PMTCT Requires Ongoing Quality Improvement and Provider Mentoring

Pre-implementation, although the vast majority of providers were excited to introduce PMTCT B+ services at their facilities, several providers were unsure how they would accommodate the provision of the new service among their existing clients, meet demand for HIV services among new clients, and simultaneously maintain the quality of their ANC service package. As outlined above, several facilities increased their number of referrals-out for HIV services due in part to high demand for HIV services and dramatic increases in patient volumes at many of the PRINMAT facilities. Of note, of all HIV-positive pregnant women who received a positive HIV test result at PRINMAT or arrived at ANC services with a known result, almost 25 percent did not return for services after their initial consultation. While this is a known point of attrition along the HIV cascade of care, it also points to the need for improved patient monitoring and finding patients lost to follow-up from PRINMAT PMTCT services.

As outlined above, due to commodity access challenges, several providers also faced a significant delay between completing their PMTCT B+ training and the introduction of PMTCT services at their facilities. Many of these providers stated that they felt nervous implementing PMTCT several months after the training, and needed to seek out additional education and support from nearby facilities. Both of these points demonstrate the need for ongoing monitoring, quality improvement, and continuing professional development efforts among nurses and midwives introducing PMTCT or ART services for the first time. In response to SHOPS data highlighting potential loss to follow-up, PRINMAT has now implemented a more rigorous patient tracking and follow-up system involving telephone calls and other community-based outreach to patients defaulting from care. In response to requests from PRINMAT and the National AIDS Control Program, SHOPS has also included a practicum and mentorship focused intervention to all future PMTCT and nurse-focused ART trainings. In order to promote ongoing quality improvement of PMTCT services, implementers pursuing similar efforts should strongly consider connecting newly trained nurse and midwife PMTCT providers with nearby ART-providing public and private facilities that can deliver ongoing mentorship, referral support, and education.

Private Sector Maneuverability Versus De Facto Public provision

The SHOPS PMTCT B+ intervention succeeded as a PPP by connecting PRINMAT's private providers and leadership to public health and nursing leadership at the national and regional level. As this intervention and other global PMTCT efforts demonstrate, forging strong PPPs are often a critical factor in successfully scaling up private sector delivery of PMTCT B+ and other

essential health services. However, stock-outs and shortages of public PMTCT commodities at the district level, and national legislation preventing PRINMAT facilities from procuring ARVs elsewhere both restricted the potential impact and scale of the PRINMAT PMTCT effort. Observed downturns in HTC and PMTCT B+ service provision at the PRINMAT facilities corresponded with reported public stock-outs of PMTCT commodities, and were closely mirrored by proportional increases in referrals-out from PRINMAT for HTC and PMTCT services. Unfortunately, many of these referrals were commodity induced and unnecessary, preventing PRINMAT from delivering the full cascade of PMTCT interventions and limiting options available to PRINMAT's patients.

Because Tanzania and most other countries classify ARVs and other PMTCT B+ inputs as public goods and controlled commodities, access to such materials are typically heavily regulated or restricted. In addition, the government in Tanzania and many other resource-limited settings consider people living with HIV, pregnant mothers, and children under five as exempted or protected populations, ensuring the free provision of services to these groups. For these reasons, private health facilities seeking to implement PMTCT B+ and ART essentially become de facto extensions of the public health system, often vulnerable to the limited regulatory capacity, broken supply chain, and reporting requirements that currently restrict public PMTCT facilities. As national HIV responses mature, and as implementers look for alternative methods to rapidly scale up priority interventions such as PMTCT B+, it is perhaps time to revisit discussions relating to private sector maneuverability in procuring and delivering HIV commodities. While governments shall always steward national HIV responses and protect patients by effectively regulating care in all sectors, ongoing challenges in accessing required national HIV trainings and procuring publicly controlled HIV commodities may be significantly limiting the potential contribution of private health providers to PMTCT service delivery in some settings. Dialogue among governments, donors, and implementers is needed to explore alternate supply chain and service roll-out modalities that support extension of HIV services to private and non-state providers, rather than exposing privately delivered services to common public health system challenges.

7. CONCLUSION

The SHOPS sponsored PMTCT B+ intervention implemented by PRINMAT nurses and midwives demonstrates the powerful impact private and non-state actors can make in extending PMTCT services. The introduction of PMTCT B+ services at PRINMAT facilities sought to respond to three important pillars of the government's EMTCT strategy: addressing the shortage of PMTCT qualified health care workers to address the human resource crisis, involving the private sector, and extending services as part of an integrated community-based service package. As PRINMAT facilities had already been operating as trusted community-based sources of private ANC and delivery services, the extension of PMTCT to these facilities was intended to reach pregnant women who might not otherwise attend PMTCT and ART services outside their community.

Following the introduction of PRINMAT PMTCT services in June 2014, there was a dramatic and immediate increase in the average monthly number of HTC and PMTCT ARV interventions delivered by the 53 PRINMAT facilities, with the network providing over 18,000 HIV tests over just nine months of implementation, including over 7,000 HIV tests to pregnant women. ARV interventions increased as well, with 318 women initiated on ART at PRINMAT facilities, and 130 newborns provided with protective ARV prophylaxis. However, despite significant progress in forging relationships between PRINMAT facilities and local government, delayed and inconsistent access to public PMTCT commodities restricted the potential impact of this intervention. The impact of this irregular public commodity supply highlights the need for ongoing health system strengthening efforts in parallel to private sector scale-up initiatives in pursuing a pluralistic, collaborative, and functional health system. Where strong public-private relationships existed or were forged between PRINMAT and local government prior to the intervention, implementation was rapid and highly effective. Where competitive attitudes, inadequate district-level commodity procurement, or lengthy district registration requirements existed, roll-out at PRINMAT facilities was significantly delayed and potential impact was reduced.

As governments and global public health implementers pursue innovative and increasingly effective options to reach an AIDS-free generation, the SHOPS PMTCT B+ effort demonstrates that appropriately engaging private nurses and midwives via PPPs can be an incredibly effective way to rapidly scale up PMTCT services. Of note, given that most countries require private providers to receive national PMTCT and ART certification, and almost all countries restrict or ban private health sector access to controlled PMTCT and ARV commodities, facilities such as those in the PRINMAT network currently function as near de facto public facilities. As HIV responses mature and public health authorities increasingly seek out alternate sources of domestic financing to sustain national HIV responses, there may be benefit in exploring ways to increase private providers' ability to maneuver in procuring commodities and responding to periodic health system challenges. Without providing the private health sector with additional flexibility in procuring or purchasing PMTCT and ART commodities, particularly during periods of public stock-out, private providers remain vulnerable to the same challenges limiting or stalling PMTCT progress in the public sector.

In Tanzania, these challenges were largely addressed by a collaborative and transparent PPP between PRINMAT, the PPP-TWG, and the MOHSW PMTCT section. Today, PRINMAT facilities continue to deliver integrated ANC/PMTCT B+ services in Tanzania's poor and under-served communities, with the vast majority now receiving regular access to public PMTCT

commodities. Following the success of this initial effort, SHOPS and the MOHSW PMTCT section have trained an additional 35 PRINMAT providers to ensure that all 76 nurse and midwife-led facilities in PRINMAT's national network are certified to provide PMTCT B+ as part of their ANC service package. Moving forward, the engagement of additional private nurses and midwives in Tanzania and replicating this effort in other high-prevalence settings could be a transformative approach in reaching women and newborns with appropriate HIV care and treatment, contributing to the vision of an AIDS-free generation.

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