

Malaria, HIV and TB in Tanzania: Epidemiology, disease control challenges and interventions

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Question

What is the evidence on epidemiology (including demographic and geographic inequalities) and disease control challenges of malaria, HIV and TB in Tanzania; and on the effectiveness of interventions aimed at preventing, detecting and treating these diseases in Tanzania?

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1. Summary

Tanzania, officially the United Republic of Tanzania, is a country in East Africa within the African Great Lakes region. The population is estimated to be 61 million in 2021. Malaria, HIV and tuberculosis (TB) are significant public health concerns in Tanzania.

- HIV/AIDS was the third leading cause of death in the country in 2019 (Global Burden of Disease, 2021), accounting for 27,000 deaths in 2020 (UNAIDS, 2020).
- Tanzania is among the ten countries with the highest malaria cases and deaths (3% of the global cases, 13.4% of cases in East and Southern Africa, and 5% of global deaths) (Severe Malaria Observatory, 2021).
- Tanzania is one of the High TB Burden Countries, and one of the High TB/HIV Burden Countries. In Tanzania, it is estimated that of 154,000 new cases of TB in 2017, 31% (48,000) were also HIV positive (WHO, 2018). TB has been the leading cause of death among HIV positive individuals (Mollel et al., 2019), a close monitoring of its occurrence in this subgroup of people is important.

This rapid literature review highlights key aspects of the epidemiology of malaria, HIV and TB in Tanzania and challenges in prevention, detection and treatment; and surveys select interventions that seek to address these challenges.

Part I: Epidemiology

Demographic variation:

Socioeconomic status: The epidemiological profiles of malaria, HIV and TB are closely related to socioeconomic factors in Tanzania (Mtenga et al., 2016). While, Tanzania has made significant progress towards achieving global and national targets in key areas of well-being, particularly in health and education, these achievements risk being undermined by persistent poverty. Besides economic disparities, poverty has been linked to health vulnerability.

Age: The nationally representative 2016-2017 Tanzania Impact Survey (THIS) found that women aged 15-39 are more than twice as likely to be living with HIV as their male counterparts. HIV prevalence is highest among women aged 45-49, at 12% (compared with 8.4% among men of this age) (Ministry of Health, 2019).

Key populations (KP): female sex workers (FSW), men who have sex with men (MSM) and people who inject drugs (PWID) - and their partners – are also at risk. HIV prevalence in PWID is 16%; among Female Sex Workers in Dar es Salaam, HIV prevalence has been reported to be as high as 31.4%; the estimated HIV prevalence is 17.6% as of 2016 UNAIDS estimates amongst MSM.

Geographic variation: The burden of disease varies across Tanzania with distinct pockets dependent on the disease being studied. The average malaria prevalence in mainland Tanzania stood at 9% in 2016 (Ministry of Health, 2016), however, the prevalence varies considerably between and within regions across the country. Notably, malaria prevalence varies from <1% in the highlands of Arusha to as high as 41% along the Lake Victoria shores. The disease has been common in low altitude areas in the country but due to observed changes in climate parameters it is becoming more common in highland areas which were previously malaria-free (Ministry of Health, 2018).

Moreover, other factors that influence prevalence include ecologic and environmental factors, host and vector behavioural characteristics, population immunity to malaria, efficiency and/or coverage of mosquito control interventions as well as the economic status of reference communities. The burden of HIV infection also varies geographically across Tanzania, ranging from ~11% in Njombe to less than one percent (<1%) in Zanzibar (Avert, 2020). HIV prevalence also varies between urban and rural areas - 7.5% versus 4.5% respectively. There is uneven distribution of TB burden in Tanzania with seven out of 30 regions contribute to 66% of the TB burden in Tanzania (UNAIDS, 2019). Of the seven regions, Dar es Salaam leads in having the highest burden of TB contributing to almost a quarter (22%) of the TB burden in Tanzania in the year 2013 (UNAIDS, 2019).

Donor Financing: Tanzania's gross national income (GNI) per capita in 2017 was \$9,369, which indicates limited income to accommodate health expenditures. Tanzania's total health expenditure (THE) was 6.1% of gross domestic product (GDP) in 2015 and 11% of government spending in 2015, less than the Abuja declaration target of 15%. PATH has collaborated extensively with local and national partners, health care programs, and international partners to implement a coordinated response across Tanzania's entire health system. Their efforts aimed to scale up and improve integrated services, strengthen the private-sector delivery of TB services, enhance health professionals' ability to identify and track cases and provide treatment, improve laboratory diagnostic services, and engage and educate communities (PATH, 2016).

Part II: Disease control challenges and Part III: Related interventions

Health systems and capacity

Challenge: The finance and governance of Tanzania's health system is complex and pluralistic. It is comprised of public, private, and donor stakeholders operating at several different levels including national, regional, district, and community levels (USAID, 2013). Findings from the 2010 Tanzania Health Systems Assessment show that the country's health system has had mixed performance during the early 2000s (USAID, 2011). A high proportion of Tanzania's total health spending comes from foreign donors and households (out-of-pocket), rather than from sustainable sources such as government tax-based revenue or health insurance. While the country has made advances in improving its population's health, the Government of Tanzania and its partners recognise that the current health financing structure is not sustainable (Dutta, 2015). The Tanzanian HIV response in particular, is heavily reliant on foreign funding, with 93% coming from international donors in 2017/18 (PEPFAR, 2019).

Intervention: The health sector is considered to be a key sector for the Tanzanian government and is identified in the National Development Vision 2025 as a priority area¹. There are two primary policy documents that drive Health sector activities. These are the National Health Policy (NHP) of 2017 (Ministry of Health, 2017) and the Health Sector Strategic Plan V (HSSP V) (Ministry of Health, 2021). A goal of the HSSP V is to improve health financing: Domestic General Government Health Expenditure as percentage of GDP to increase from 2.6% to 5.0%; Health insurance coverage to increase from 14% to 58%.

¹ <https://mof.go.tz/mofdocs/overarch/vision2025.htm>

The Health Policy Project – HPP (subsequently HP+) supported the Tanzanian Ministry of Health in conducting a rapid Health Systems Strengthening assessment comprising a desk review and structured stakeholder consultations (HPP, 2014). The WHO's six health system strengthening building blocks provided a framework for the assessment.

- supply chain/pharmaceuticals,
- HRH,
- information systems,
- healthcare financing,
- leadership and governance,
- infrastructure.

The assessment identified 32 HSS priorities, nine of which were recommended by the Ministry of Health and all other stakeholders for consideration for Global Fund support (HPP, 2014).

Service delivery

Challenge: Weaknesses in procurement and supply management (PSM) are considered to particularly hinder delivery of health services in Tanzania, including HIV and AIDS, TB, and malaria services. (Hickman et al., 2014). A paper by Mboera et al. (2015) found that a well-established National Health Laboratory System was in place in Tanzania, however, the coordination of HIV laboratory services was found to be weak. Physical access to health services has significantly improved in Tanzania with the construction and renovation of PHC facilities in rural areas. Most people are living within 5 to 10 km of a clinic (World Bank, 2015). On the demand side, there have been various initiatives to: provide cash transfers to extremely poor households conditional on their utilisation of health services and Community Health Funds to provide financial protection (World Bank, 2015).

Intervention: During financial year 2019, the Government of Tanzania adopted and implemented differentiated service delivery models, including six-month/multi-month/and three-month dispensing of ARVs. Three month multi- month dispensing continues throughout the country, while six-month multi-month dispensing in Dar es Salaam, initially beginning in 2019, is still ongoing (PEPFAR, 2021).

PEPFAR (2021) does note that following the release of the January 2020 circular authorising scale up of DTG to all PEPFAR supported facilities, the Government of Tanzania and PEPFAR's collaborative efforts to support accelerated uptake of optimised DTG- based regimens across all age groups has shown continued success, where almost 90% of eligible women of childbearing age and adults were on optimised regimens by the end of COP19.

Vertical care

Challenge: The accessibility of Tanzania's health service has been challenged with inadequate fund, shortage of fully trained health staff in the hospitals, poor communication and transport infrastructure. These challenges have been hindering the development plans of Tanzania's health system.

Intervention: With support from the USAID, PATH worked with the Tanzania Ministry of Health to introduce tuberculosis (TB) and HIV collaborative activities beginning in 2005. Since then, PATH's activities in supported regions have resulted in (PATH, nd.):

- Almost all TB patients being tested for HIV.
- A tripling of the rates of antiretroviral therapy (ART) use among TB/HIV co-infected patients.
- An innovative model for management of TB/HIV co-infection that can be adapted for use in other countries.
- In 2018, 91% of pregnant women attending antenatal services received HIV testing. In addition, only half (47%) of infants exposed to HIV during pregnancy were tested for HIV within eight weeks of birth (known as 'early infant diagnosis') (Avert, 2020; Ministry of Health, 2013a). To reach as many women as possible, the vast majority of PMTCT services are now integrated with reproductive and child health services (Ministry of Health, 2013a).
- Cash transfer programmes form part of a new arm of HIV prevention that focuses on integrated programmes for social protection schemes and sexual health. Across sub-Saharan Africa these types of programmes have been shown to have a positive effect on preventing HIV and other sexually transmitted infections (STIs) (Avert, 2020).

Surveillance

Challenge: Disease surveillance is a cornerstone of outbreak detection and control. The Government of Tanzania adopted the Integrated Disease Surveillance and Response (IDSR) system as the platform for all disease surveillance activities in the country. Tanzania's IDSR guidelines include surveillance and response protocols for 34 diseases and conditions of public health importance (Nkowane, 2019). Over the years, IDSR procedures and the structures that support them have received significant government and external resources to maintain and strengthen detection, notification, reporting, and analysis of information. However recent reviews show maintaining surveillance systems are a key risk due to funding withdrawal from vertical programmes and weaknesses in domestic funding.

Intervention: The Government of Tanzania adopted the Integrated Disease Surveillance and Response (IDSR) system as the platform for all disease surveillance activities in the country. Tanzania's IDSR guidelines include surveillance and response protocols for 34 diseases and conditions of public health importance. However, Tanzania has limited capacity, especially at community level, to detect outbreaks and this weakens its ability to promptly respond and control public health threats or events in a timely fashion (CDC, 2016).

Information and stigma
In 2016 a national assessment was undertaken in during which overall health systems functions were examined, along with health facility practices and capacity to implement TB case detection interventions. Four evidence-based prioritised approaches were developed to scale-up TB case detection throughout the country (Global Fund, 2018).

Challenge: Challenges to health-literacy in Tanzania include inaccurate, inconsistent, untrustworthy, unreliable, untimely, contradictory, and confusing information. Additional challenges include language barriers; high cost of internet, poor connectivity, the ratio of healthcare providers to patients, poverty, and traditional beliefs (Shamsudeen & Rajabu, 2020).

Education and communication:

Challenge: Tanzania faces serious challenges to improving the health and well-being of its people. It is the country's aim to provide health education to the community through a number of

strategies and approaches. However, available information indicate that community health education and information communication has had limited impact on behavioural changes and hence disease prevention and control. The healthcare delivery system is fraught with barriers to health communication at all levels, partly due to the paternalistic use of scientific and medical terminology to communicate between systems and between systems and providers, which trickles down to communication between providers and patients or communities (Mboera, 2007).

Intervention: Advocacy, communication, and social mobilisation (ACSM) has been identified by the WHO as a critical component of effective control of TB. The Ministry of Health is committed to integrating ACSM into health planning and programming. ACSM has three distinct sets of activities which have the shared goal of bringing about behavioural change (NTLP Website):

- **Advocacy:** Primarily works to change the behaviour of public leaders or decision-makers.
- **Communication:** Generally, targets individuals or small groups in the public.
- **Social mobilisation:** Aims to secure community-based support.

Stigma and discrimination is also a major challenge, particularly in relation to HIV. In 2016/17, around 25% of those surveyed for the country's HIV Impact Assessment demonstrated discriminatory attitudes towards people living with HIV (Ministry of Health, 2019).

While Tanzania has a fairly broad sex education curriculum, only a third of schoolteachers have been trained on how to deliver these lessons, meaning access is patchy. In addition, certain subjects, such as the examination of minority sexualities, are not covered. Condom demonstration and condom distribution is banned during sex education lessons (Avert 2020).

A growing body of evidence investigates how entertainment education influences knowledge about HIV, stigma toward those with HIV, and openness to disclosing one's HIV status. A study undertaken by Green et al., (2021) shows that in addition to these effects, mass media interventions may influence audiences' policy priorities, such as their demand for local access to HIV/AIDS medical care.

Part I: Epidemiology

2. Incidence of disease

Malaria: Malaria is the most important vector-borne disease in Tanzania, causing high morbidity and mortality (Mboera, 2016). The entire population of Mainland Tanzania is considered at risk for malaria, although transmission varies significantly among and within regions. According to the World Malaria Report (WHO, 2020), 93% of the population in mainland Tanzania live in malaria transmission areas. The country has three malaria transmission seasons (WHO, 2020; Severe Malaria Observatory, 2021):

- **Stable perennial transmission:** 60% of the country falls in this category.
- **Stable malaria transmission (with seasonal variation):** in 20% of the country.
- **Unstable seasonal malaria transmission:** This occurs in approximately 20% of the country.

Plasmodium falciparum is responsible for 96% of malaria infection in Tanzania, while *P. malariae* and *P. ovale* account for the remaining 4% (Severe Malaria Observatory, 2021).

Tanzania is among the top ten countries globally with the highest rates of malaria cases and deaths (3% of global cases and 4.1% of global deaths) (WHO, 2021). Between 2015 and 2019, case incidence decreased 14.5%, from 130 to 111 per 1,000 of the population at risk, and deaths fell by about 4% (from 0.39 to 0.38 per 1,000 of the population at risk) during the same period (USAID, 2020).

The disease has been common in low altitude areas in the country but due to observed changes in climate parameters it is becoming more common in highland areas which were previously malaria-free (Ministry of Health, 2018).

HIV: In 2020, 1.7 million people were living with HIV in Tanzania. This equates to an estimated HIV prevalence among adults (15-49) of 4.7% (UNAIDS, 2021). In the same year, 68,000 people were newly infected with HIV, and 32,000 people died from an AIDS-related illness (UNAIDS, 2021). UNAIDS conclude that, changes in new infection since 2010 to 2021 was -35% and in AIDS related deaths -49%.

According to earlier estimates provided by the THIS 2016-2017 study (THIS, 2018), the prevalence of HIV among adults aged 15-64 was 7% among females and 4% among males. UNAIDS Spectrum 2020 estimates approximately 1.74 million people living with HIV (PLHIV) in Tanzania out of total population of 56,194,4483, with regional variations from 8,251 (Zanzibar) to 219,428 (Dar es Salaam) (THIS, 2018). According to the THIS 2016-2017, the prevalence of viral load suppression (VLS) among HIV-positive adults aged 15-64 years in Tanzania who self-report current use of antiretroviral therapy (ART) is 87% (89% among females and 83% among males) (THIS, 2018).

Tanzania's HIV epidemic is generalised, meaning it affects all sections of society, but there are also concentrated epidemics among certain population groups, such as people who inject drugs, men who have sex with men, mobile populations and sex workers (Avert 2020). Heterosexual sex is reported to account for the vast majority (80%) of HIV infections in the country and women are particularly affected (Tanzania Ministry of Health, 2014). The severity of the epidemic also varies geographically. Some regions of Tanzania report no HIV prevalence (Kusini Unguja and Kaskazini Pemba) while other regions have prevalence as high as 11.4% (Njombe) (TACAIDS, 2018).

While the major programmatic and system gaps are considerable, data show some areas of important progress. The Tanzania HIV/AIDS and Malaria Indicator Survey (THMIS) from 2011/2012 showed that HIV prevalence among adults aged 15-49 years was 5% while the THIS showed an HIV prevalence of 4.7% (PEPFAR, 2021). Projections from the UNAIDS Spectrum 2020 model show that, the number of new HIV infections have been declining steadily over the years, from 81,793 to 80,523 between 2015 and 2016; and in 2018, it was estimated to be 72,547 while in 2020 was 68,000. Additionally, the total deaths for PLHIV has also been steadily declining, from an estimated 40,785 to 38,835 between 2015 and 2016 compared to an estimated decrease to 32,000 total deaths in 2020 (PEPFAR, 2021).

TB: The United Republic of Tanzania is one of the 30 countries with the highest burden of tuberculosis (TB) in the world. According to the WHO (2020), 142 000 people (253 per 100 000 population) fell ill with TB in 2018. According to the NTPL (NTPL Website)², the TB incidence rate in Tanzania has fallen from 306 per 100,000 population in 2015 to 253 per 100,000 in 2018

² <https://ntpl.go.tz/tuberculosis/tb-prevalence/>

indicating a 17% reduction of TB Incidence rate. The NTPL comment that this makes Tanzania among the seven TB high burden countries which are on track to achieve the End TB 2020 Incidence milestones. There has been a 19% reduction in TB mortality from 58/100,000 in 2014 to 40/100,000 in 2018 (NTPL Website).

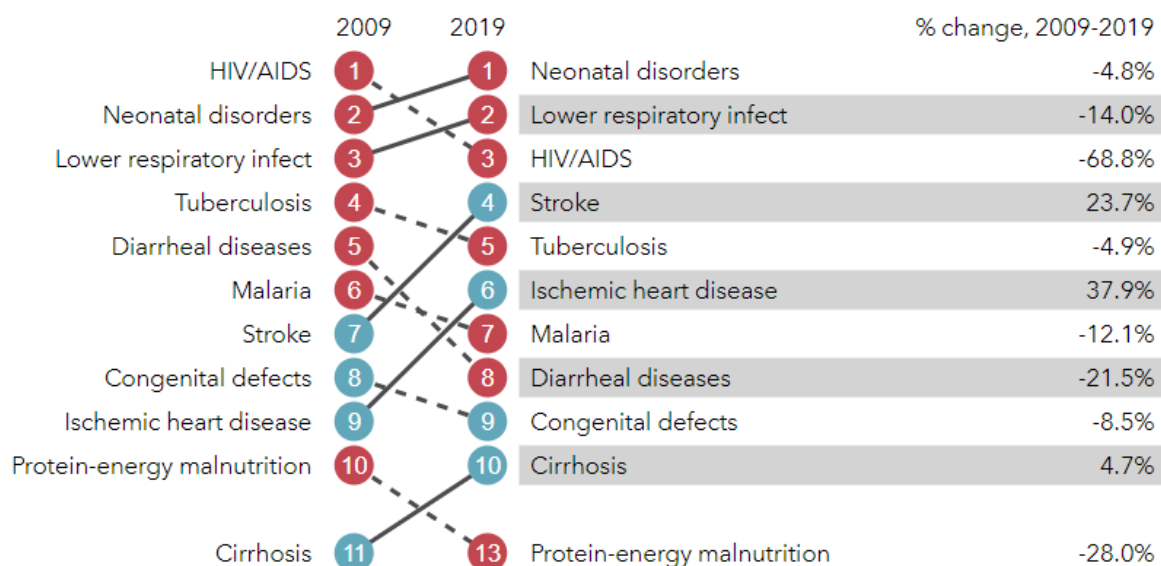
In 2018, a total of 75,845 cases of TB were notified, which is an increase of 6,205 cases or 9% compared to 2017. New and relapse TB cases notified were 74,692 among them, 48% were bacteriological confirmed TB cases, 79% were pulmonary TB cases and children among the new and relapse cases were 14% (NTPL Website).

The country TB notification rate has been increasing for the last four years: 2015 to 2018, but there is still variation among the regions. In 2018, sixteen regions including the islands of Unguja na Pemba have notification rate below the national average of 138 cases per 100,000 population (NTLP Website).

More concerning, the WHO (2020) report that only 75,828 people with TB were notified overall, leaving 47% of people still unreached by national TB services. Over the past 15 years, communities affected by TB have played an increasingly important role in implementing the National Strategic Plan (NSP) for TB in Tanzania. Their increasing involvement reflects the findings of studies conducted between 2003 and 2005, which showed that empowering and involving affected communities, including former TB patients, is an effective way of increasing TB case detection and improving TB treatment outcomes (WHO, 2020).

In terms of the top ten causes of mortality in Tanzania, HIV/AIDS ranked third, TB fifth and malaria seventh. Table 1 lists the top ten causes of deaths in 2009 and 2019 and the % change between these years (IHME Website³ - see figure 1).

Figure 1: **Tanzanian leading causes of death. 2009 and 2019**



Source: IHME. Reproduced under Creative Commons Attribution-Non-commercial-No Derivatives 4.0 International License <https://www.healthdata.org/tanzania>

³ <https://www.healthdata.org/tanzania>

Malaria-HIV: This review identified limited studies that explored malaria-HIV co-infection. Those identified focused on particular groups and locations, and as such, their findings should not be viewed as representative of Tanzania as a whole.

A study undertaken by Manyanga et al (2014) that explored the prevalence of malaria and anaemia among HIV infected pregnant women receiving co-trimoxazole prophylaxis in Tanzania enrolled 420 HIV infected pregnant women in Kinondoni Municipality. The authors reported that the prevalence of malaria infection was 4.5%, while that of anaemia was 54%. The proportion of subjects with poor adherence to co-trimoxazole was 50.5%. As compared to HIV infected pregnant women with good adherence to co-trimoxazole prophylaxis, the poor adherents were more likely to have a malaria infection. Other risk factors associated with anaemia were advanced WHO clinical stages, current malaria infection and history of episodes of malaria illness during the index pregnancy.

A study by Ezeamama et al. (2012) highlighted that data from Tanzania suggest that HIV-infected children were more likely than HIV-negative children to develop malaria over 2 years of follow-up. Repeat malaria episodes were common, and children coinfecting with HIV had a 28%–127% higher risk of developing a second malaria episode as compared to HIV-negative children. This finding suggests the presence of synergistic negative interactions between HIV infection and malaria in coinfecting children that may amplify malarial morbidity in such children.

TB-HIV: Tanzania is one of the High TB Burden Countries, and one of the High TB/HIV Burden Countries. In Tanzania, it is estimated that of 154,000 new cases of TB in 2017, 31% or 48,000 were also HIV positive (WHO, 2018; Mollel et al., 2019). But with only 93% of TB patients in Tanzania having test results for HIV, of which 36% were co-infected with HIV, the true burden of TB among HIV positive people could be underestimated. TB has been the leading cause of death among HIV positive individuals (Mollel et al., 2019), a close monitoring of its occurrence in this subgroup of people is important. Several factors have been associated with TB incidence among HIV positive individuals, very low CD4 count (<50 cells/ μ l), anaemia, inappropriate vaccinations, cigarette smoking, households with a family size of three to four people, a lower social class, non-adherence to drugs and severe immunosuppression (Mollel et al., 2019).

Among HIV positive patients attending Tanzanian Care and Treatment (CTC) programmes, poor nutritional status, low CD4 counts and not taking ART treatment were associated with higher TB incidence, highlighting the need to get PLHIV on treatment early, and the need for close monitoring of CD4 counts (Mollel et al., 2019). The biggest reductions in TB deaths among people living with HIV have been in India (a 83% reduction since 2010), Kenya (a 70% reduction), South Africa (a 77% reduction) and Tanzania (a 71% reduction) (UNAIDS, 2021).

Socioeconomic status

Socioeconomic status (SES) has been identified as a fundamental cause of disease with people who are poor and powerless having worse health and longevity than those with money, power, and prestige (Flaskerud & DeLilly, 2013). Tanzania's social and economic development is challenged by sharp inequalities – between and within urban centres and rural areas, and also among different socio-economic groups. Economic disparity is compounded by unequal access to essential basic services and employment opportunities and challenged by gender imbalance of labour and structural and social norms, as well as unequal power relations. While, Tanzania has made significant progress towards achieving global and national targets in key areas of well-

being, particularly in health and education, these achievements risk being undermined by persistent poverty with poverty being linked to health vulnerability (Mtenga et al., 2016).

Dickson et al. (2012) comment that while policies often target malaria prevention and treatment - proximal causes of malaria and related health outcomes - too little attention has been given to the role of household- and individual-level SES as a cause of disease risk. They found that access to prevention and treatment is significantly associated with indicators of households' wealth, however, they report that education-based disparities do not emerge in this context. Meanwhile, reported malaria illness shows a stronger association with demographic variables than with SES (controlling for prevention). Dickinson et al (2012) conclude that greater understanding of the mechanisms through which SES and malaria policies interact to influence disease risk can help to reduce health disparities and reduce the malaria burden in an equitable manner.

In a similar vein, Lowassa et al., (2012). found that distance to the health centre influenced malaria treatment seeking behaviours, and the number of visits made by the household members. In addition, the education level of the household heads played a role in understanding and in the selection of malaria interventions for the households. The authors conclude that increasing the number of health facilities close to rural areas will improve malaria treatment seeking behaviour, case management and hence reduce malaria-associated morbidities, especially in high risk groups.

In terms of Malaria, Aikambe and Mnyone (2020) report that people living in resource poor and marginalised areas suffer most, particularly children under-five and pregnant women in these communities. The authors of this study in Tanzania conclude that such groups are severely affected because they lack acquired and/or have suppressed immunity.

In terms of HIV, studies have shown a mixed association between socioeconomic status (SES) and prevalent HIV infection across and within settings in sub-Saharan Africa. In general, the relationship between years of formal education and HIV infection changed from a positive to a negative association with maturity of the HIV epidemic. Amuri et al., (2011) comment that Tanzanian HIV infection rates are reportedly higher in urban areas in, among women and among those with more education.

In contrast Bunyasi and Coetzee (2017) comment that the association between HIV infection and SES differed by province and by measure of SES and underscores the disproportionately higher burden of prevalent HIV infection among poorer and less educated women. They conclude that their findings suggest the need for re-evaluation of whether current HIV prevention efforts meet the needs of the least educated and the poorest women and point to the need to investigate the impact of socioeconomic and cultural barriers on uptake and utilisation of diagnostic and treatment tools in East Africa additional or tailored strategies for these women.

Finally, UNAIDS (2019) comment that TB thrives in conditions of structural inequity, where the complexities of poverty, social inequity, disempowerment, rights-violations, conflict and patriarchy render communities susceptible to TB and marginalise access to diagnosis, treatment and care. Msoka et al., (2021) undertook a study assessing the impact of socioeconomic and cultural barriers on uptake and utilisation of tuberculosis diagnostic and treatment tools in East Africa (the study focussed on Kenya, Uganda and Tanzania). They found that socioeconomic and cultural factors such as poverty, stigma and inadequate knowledge about causes of disease and

available remedies, cultural beliefs were associated with low access and utilisation of diagnostic and treatment tools for TB. They continue that:

- Poverty made people hesitate to seek formal healthcare resulting in delayed diagnosis and resorting to self-medication and cheap herbal alternatives.
- Fear of stigma made people hide their sickness and avoid reporting for follow-up treatment visits.
- Inadequate knowledge and beliefs were fertile ground for aggravated stigma and believing that diseases like TB are caused by spirits and thus cured by spiritual rituals or religious prayers.
- Cultural norms were also the basis of gender-based imbalance in accessing care.

Siroka et al., (2016) analysing national TB prevalence surveys from eight countries (including Tanzania⁴) concluded that overall, a strong and consistent association between household SES and individual TB disease was not found. However significant results were found in four individual country models, with the lowest socioeconomic quintile being associated with higher TB risk in Mongolia, Myanmar, Tanzania and Viet Nam.

Gender and key populations

Gender influences notification rates, reporting, exposure and prevalence of malaria, TB and HIV/Aids in a number of ways, with variations reported between rural and urban areas as well as between different regions of the country.

UNAIDS (2019) reports that TB notification case rates are usually higher in men as compared to women, with strong evidence that men are disadvantaged in seeking and/or accessing TB care in many settings. In a systematic review assessing sex differences in TB burden and case notification in Low and Middle Income Countries (including Tanzania) Male/Female prevalence ratios have been shown to be 2.21 for bacteriologically positive TB and 2.51 for smearpositive TB (Horton et al., 2016). A summary figure of surveys done in Africa region with regional summary of M:F of 1.73 for bacteriologically-positive TB (Horton et al., 2016). Such findings confirm the need for global strategies and national TB programmes to recognise men as an underserved high-risk group and improve men's access to diagnostic and screening services to reduce the overall burden of TB more effectively and ensure gender equity in TB care.

More specifically, studies have shown that the burden of TB in Tanzania disproportionately affects men as compared to women across all the age-groups. In the year 2016, of 65,908 notified TB patients, 39,207 (61%) cases were males and 24,694 (39%) females with a sex ratio of over 1:1.5. The number of children aged 0–14 years old notified among new and relapse cases were 6,351 (10%). The disease burden is concentrated in the age-groups of 25-34 years and 35-44 years for both males and females (UNAIDS, 2019).

Among studies reporting disparities in TB care, women faced greater barriers (financial: 64% versus 36%; physical: 100% versus 0%; stigma: 85% versus 15%; health literacy: 67% versus

⁴ Study countries included: Malawi, Mongolia, Myanmar, the Philippines, Rwanda, Tanzania, Viet Nam and Zambia

33%; and provider-/system-level: 100% versus 0%) and longer delays (presentation to diagnosis: 45% versus 0%) than men (Yang et al., 2014)..

The nationally representative 2016-2017 Tanzania Impact Survey (THIS) found that women aged 15-39 are more than twice as likely to be living with HIV as their male counterparts. HIV prevalence is highest among women aged 45-49, at 12% (compared with 8.4% among men of this age) (Ministry of Health, 2019). HIV prevalence peaks at 12% among females aged 45 to 49, as compared to a peak of 8.4% among males aged 40 to 44. HIV prevalence among 15 to 24 year olds is 1.4% (2.1% among females and 0.6% among males). The disparity in HIV prevalence between males and females is most pronounced among younger adults, with prevalence among women in age groups 15 to 19, 20 to 24, 25 to 29, 30 to 34, and 35 to 39 more than double that of males in the same age groups (THIS, 2018).

The prevalence of HIV is less than 2% among 15-19 years for both males and females and then increases with age for both sexes. Age disparities in new HIV infections suggest an increase in the numbers of new infections among younger populations (PHIA (THIS) of 2016/17 quoted in UN AIDS, 2020). The THIS study further estimated that 62% of PLHIV know their status; 90.9% of those who know their status are on treatment and 87.7% on treatment were virally suppressed. The draft 2020 Tanzania HIV estimates suggest that among 15-49 years old in 2019, HIV prevalence was 4.6%, and 58,000 new HIV infections.

There were 6,500 new infections among children below 15-year-olds. About 100% of pregnant women living with HIV received ART for PMTCT, and 78% of children living with HIV are on ART. UNAIDS (2020) highlight that about 50% of all new infections are from the 15 – 29 years old age group (UNAIDS, 2020). HIV prevalence has steadily declined over the past decades from 7% in 2003 to 4.6% in 2018 in adults 15 -49 years. The prevalence of HIV among children aged 10-14 is less than 1% (0.3%) yet the proportion of children with HIV who are virally suppressed is low at 18% (THIS, 2018).

THIS 2016-2017 data also showed that HIV prevalence varies by population in Tanzania. HIV prevalence is highest among females aged 40 to 44 years, at approximately 11% compared to 8.5% among males aged 40 to 44 years. According to the 2020 UNAIDS Spectrum Estimates, prevalence among adults aged 15 to 24 years is 2.9% (3.8 % among females and 1.9% among males), while prevalence among children aged 0-14 years is 0.3%.

Avert (2020) concludes that women are disproportionately affected by HIV in Tanzania. In 2018, 880,000 women aged 15 and over were living with HIV, compared to 580,000 adult men (Avert, 2020). UNAIDS compiled data that analyses trends in HIV infections, deaths and PLHIV between 2010,2015 and 2020 and presents it as follows (see table 1).

Table 1: Tanzania HIV/AIDS Epidemic Estimates (UNAIDS, 2021)

	2010	2015	2020
New HIV infections (women, 15+)	49,000	49,000	37,000
New HIV infections (men, 15+)	37,000	31,000	21,000
AIDS-related deaths (women, 15+)	27,000	12,000	11,000
AIDS-related deaths (men, 15+)	20,000	18,000	13,000
People living with HIV (women, 15+)	700,000	860,000	1,000,000
People living with HIV (men, 15+)	500,000	560,000	610,000

Source: UNAIDS, 2021: 92. Reproduced under CC BY-NC-SA 3.0 IGO
https://www.unaids.org/sites/default/files/media_asset/JC3032_AIDS_Data_book_2021_En.pdf

Gender inequality is widespread among women of all ages in Tanzania. In 2016, around 30% of women aged 15-49 who had ever been married or in a long-term relationship were estimated to have experienced physical or sexual violence from a male intimate partner in the past 12 months (Avert, 2020; UNAIDS, 2019a). This increases many women’s vulnerability to HIV, either directly, through sexual violence, or indirectly, through an inability to negotiate condoms or prevent their partner from having other sexual relationships. In addition, women tend to become infected earlier because they have older partners and get married earlier (TACIDS, 2013).

In terms of Malaria, males across all age groups were more affected compared to females (Aikambe & Mnyone, 2020; Rumisha et al., 2019). Rumisha et al. (2019) undertook a study in selected areas of Mvomero district and found 16% higher odds of having malaria in males relative to females. The authors concluded that this could be attributed to the lifestyle and occupation of males. Males are usually involved in agricultural, day labour and hunting in environments that are suitable for mosquito breeding. They also suggest that males spend more time outdoors and/or go to bed late compared to females, thus increasing their exposure to mosquito bites (Rumisha et al., 2019).

Key populations: Key populations (KPs) play a critical role in disease transmission dynamics, particularly in terms of HIV. KPs include Men who have Sex with other Men (MSM), female commercial sex workers (FSW) and also orphans and vulnerable children (OVC) such as street children and people who inject drugs (PWID).

Key and vulnerable populations are considered to be the main drivers of the global HIV epidemic (APHRC, 2018). For the Global Fund, these key populations have been identified as commercial sex workers, men who have sex with men and people who inject drugs; young women and girls are also highly vulnerable and represent the fastest-growing group of new infections. Currently more than 40% of new HIV infections in Sub-Saharan Africa among women occur among those aged 15-24. Though new infections are declining overall, adolescents and young women have

disproportionately higher rates of new infections as compared to other population groups (APHRC, 2018).

Whilst HIV is a generalised epidemic in Tanzania, with heterosexual transmission the main route of transmission, recent studies have highlighted a growing concern on the potential role of key populations in HIV epidemic in the country. Studies have shown significantly higher HIV prevalence in certain populations compared to the general population. These studies have also reported risk taking behaviours among members of these populations (Mpondo et al., 2017).

The HIV prevalence of some of these KP from the Global AIDS Response Country Progress Report, 2020 are (UNAIDS 2020):

- HIV prevalence in PWID is 16%
- Among Female Sex Workers in Dar es Salaam, HIV prevalence has been reported to be as high as 31.4%.
- Men who have sex with men: the estimated HIV prevalence is 17.6% as of 2016 UNAIDS estimates.
- Children: there are estimated 10,000 new HIV infections in 2016 and 48% of all HIV-positive children are on ART treatment.

More focused studies have identified particular issues in Dar es Salaam where it is estimated that HIV prevalence is 36% among people who inject drugs (PWID), 26% among sex workers (SWs), and 25% for men who have sex with men (MSM) (Mpondo et al., 2017).

VLS among HIV-positive individuals in Tanzania is highest among older adults, with 64.4% of females ages 55 to 64 virally suppressed, and 61.5% of males ages 55 to 64 virally suppressed. Gender disparity in VLS is greater among younger adults, with 47.1% and 50.5% of females ages 15 to 24 and 25 to 34 virally suppressed, respectively and 22.2% and 25.7% of men in the corresponding age groups virally suppressed (Ministry of Health, 2018).

3. Geographic variation

Regional variation

The burden of disease varies across Tanzania with distinct pockets dependent on the disease being studied. In what follows, a mapping of disease is provided from available sources.

Malaria: The average malaria prevalence in mainland Tanzania stood at 9% in 2016 (Ministry of Health, 2016), however, the prevalence varies considerably between and within regions across the country. Notably, malaria prevalence varies from <1% in the highlands of Arusha to as high as 41% along the Lake Victoria shores. Moreover, other factors which could have been responsible to the fluctuation of malaria cases observed over the six-year period of this study include ecologic and environmental factors, host and vector behavioural characteristics, population immunity to malaria, efficiency and/or coverage of mosquito control interventions as well as the economic status of reference communities (Ministry of Health, 2016).

Figure 2: Percentage of children age 6-59 months classified as having malaria according to rapid diagnostic test (RDT)

Source: Ministry of Health, 2018a: 12. This figure has been removed for copyright reasons. The figure can be viewed at <https://dhsprogram.com/pubs/pdf/ATR20/ATR20.pdf>

The 2017 Tanzania HIV and Malaria Indicator Survey (THMIS) indicated that (Ministry of Health, 2018a):

- 78% of households owned at least one insecticide-treated mosquito net (ITN), an increase from 38% in 2007-8.
- 54% of children slept under bed nets, an increase from 25% in 2007-8.
- 57% of pregnant women received at least 2 doses of intermittent preventive treatment (IPTp), an increase from 35% in 2015–16.
- 26% of pregnant women received 3 or more doses of IPTp (IPTp3 or IPTp3+), an increase from 8% in 2015–16.

More recent studies assert that In Tanzania, malaria prevalence has gone down by more than 50% over the past decade, from 18% in 2008 to just 7.3% in 2017, mainly as a result of near universal coverage with long-lasting insecticide-treated bed nets (LLINs), indoor residual sprays (IRS), reliable and affordable diagnosis and treatment, and improved livelihoods (Finda et al., 2020).

COVID-19: The global pandemic has had an impact on the number of malaria tests performed across similar periods using data from selected health facilities. In Tanzania, in April and June 2019 66,914 tests were performed, in the same months in 2020, 31,458 were performed (a change of 53%. Data for July and September 2019 and 2020 provides a more modest decline of 10.6% (46,780 versus 41,802)

HIV: The burden of HIV infection also varies geographically across Tanzania, ranging from ~11% in Njombe to less than one percent (<1%) in Zanzibar (Avert, 2020). HIV prevalence also varies between urban and rural areas - 7.5% versus 4.5% respectively. According to UNAIDS (2020) Njombe region has the highest prevalence estimate (11.4%) followed by Iringa (11.3%) and Mbeya (9.3%). Lindi region has the lowest HIV prevalence of less than 1%. Modelling exercises also suggest a shift of HIV burden among fewer regions. Mwanza, Morogoro, Mbeya, Tabora, Iringa, and Ruvuma showed the highest net increase of estimated number of PLHIV compared to COP20 Spectrum outputs (COP21, 2021). Conversely, Kagera, Dar es Salaam, Kilimanjaro, Kigoma, and Mtwara showed the largest decrease in estimated number of PLHIV compared to earlier estimates (COP21, 2021).

COVID-19: Notable decreases in PLHIV for larger urban regions, namely Dar es Salaam, provide an indication of client movement outside of densely populated areas in response to COVID-19 fears (COP21, 2021). Throughout the latter half of FY20, PEPFAR/T continued to prioritise provision of safe and flexible HIV care and treatment services to ensure COVID-19 did not adversely affect PLHIV throughout the country. In COP21, targeted programming will continue to focus on the alignment of resources with the latest epidemiologic information.

Figure 3. HIV prevalence among adults aged 15 years and older, by region, THIS 2016-2017

Source: Ministry of Health, 2017: 16. This figure has been removed for copyright reasons. The figure can be viewed at https://www.measureevaluation.org/resources/publications/tr-18-302/at_download/document

Studies conducted in various regions of Tanzania have reported low linkage to care for people who test HIV-positive. For example a study following around 1,000 people newly diagnosed with HIV in Mbeya, a rural area, found just 28% were successfully linked to care. Under-resourced, poorly coordinated health services, as well as high levels of HIV-related stigma were the main reasons these people did not begin treatment (Sanga et al., 2018).

TB: There is uneven distribution of TB burden in Tanzania with seven out of 30 regions contribute to 66% of the TB burden in Tanzania (UNAIDS, 2019). Of the seven regions, Dar es Salaam leads in having the highest burden of TB contributing to almost a quarter (22%) of the TB burden in Tanzania in the year 2013 (UNAIDS, 2019).

Dar es Salaam city remains a major contributor of TB cases notification in Tanzania. Its contribution amounts to 20% of all cases notified in the country in 2018, a 1% decline as compared to year 2017. There was considerable regional variation as in the previous years with 50% of cases being contributed by seven regions - Dar-es-Salaam, Mwanza, Arusha, Geita, Dodoma, Manyara and Mbeya (NTPL, Website).

There also exists distinct differences between rural and urban TB patients. TB patients in rural Tanzania are likely to be older with more recurrent TB cases, have more limited access to anthelmintic medication individually, have a longer TB diagnosis delay, and seek more frequently care from traditional healers. The overall prevalence of helminth co-infections in TB patients was higher in the urban setting, predominantly driven by *S. stercoralis* infection, but the prevalence of *S. mansoni* was higher in the rural setting (Sikalengo et al., 2018). Sikalengo et al., (2018) conclude that these observations may guide public health interventions that target, for example, traditional healers in rural settings, aiming to improve early detection of TB cases and referral for anti-tuberculosis treatment.

Figure 4: TB notification rates 2016

Source: Global Fund, 2018: 2. This figure has been removed for copyright reasons. The figure can be viewed at https://www.theglobalfund.org/media/8272/core_pqe-in-tanzania_casestudy_en.pdf

Part II: Disease control challenges

4. Sectoral challenges: health systems and capacity

Governance and financing

In 2018, Mahundi et al, (2019) reported that there were 7,249 health facilities in Tanzania, composed of 252 hospitals, 718 health centres, and 6,279 dispensaries/clinics. In terms of the number of health care professionals per population, the WHO reports that there are 0.5 doctors and 24 nurses per 100,000 population and the figures vary between urban and the rural areas (WHO 2015).

The Tanzanian health system is reported to have significantly improved the provision of effective essential health services. The Global Burden of Disease Study (2020) reports that in 1990 Tanzania had a Universal Health effective coverage index⁵ of 35.6, in 2010 this had increased to 45.2 and in 2019 it was 55.2 (Global Burden of Disease, 2020).

Despite these improvements, Tanzania's health system remains complex and pluralistic. It is comprised of public, private, and donor stakeholders operating at several different levels including national, regional, district, and community levels (USAID, 2013). Findings from the 2010 Tanzania Health Systems Assessment show that the country's health system has had mixed performance during the early 2000s (USAID, 2011).

Persistent health system challenges in Tanzania are also impeding the achievement of national development goals and consequently those relating to Malaria, HIV/AIDS, TB etc. These challenges include, but are not limited to, the shortage of health care workers, health commodity stock outs, and insufficient financing (USAID, 2013).

Reliance on external funding: A high proportion of Tanzania's total health spending comes from foreign donors and households (out-of pocket), rather than from sustainable sources such as government tax-based revenue or health insurance. While the country has made advances in improving its population's health, the Government of Tanzania and its partners recognise that the current health financing structure is not sustainable (Dutta, 2015).

The Global Burden of Disease (2021) reports that a total of US\$40 per person was spent on health which can be subdivided into the following amounts:

- Prepaid private spending (US\$0.36)
- Out of pocket spending (US\$9.22)
- Government Health Spending (US\$16.50)
- Development assistance for health (\$13.82)

⁵ The Universal Health Coverage (UHC) effective coverage index aims to represent service coverage across population health needs and how much these services could contribute to improved health.

The Tanzanian HIV response in particular, is heavily reliant on foreign funding, with 93% coming from international donors in 2017/18 (PEPFAR, 2019). Major international donors include the US, Canada and Japan, UNAIDS, the Global Fund and PEPFAR, the latter of which is Tanzania's largest international funder (PEPFAR, 2019). In the 2020 financial year, PEPFAR will finance 64% of Tanzania's HIV treatment and care, 100% of voluntary medical male circumcision (VMMC) and laboratory activities, 92% of PMTCT services and more than 70% of HIV prevention for priority populations (Avert, 2020). Increasing the Tanzanian government's domestic contribution and improving accounting and reporting on disease spending is considered to be a priority.

Although external contributions for the HIV response have increased since the publication of Tanzania's HIV Investment case 1.0 in 2016, domestic contributions have not increased significantly. Total HIV financing grew from USD 354.5 million in 2015 to USD 606.8 million in 2017 (PEPFAR, 2021). PEPFAR and the Global Fund accounted for 88% of financing in 2015 and 2016 and 90% in 2017. Several other donors and partners beyond PEPFAR and the Global Fund have provided small amounts of financial support and technical assistance (see table 2).

Table 2: Total Budget by Funder, 2021

Source: PEPFAR, 2021: 16. This table has been removed for copyright reasons. The table can be found at https://www.state.gov/wp-content/uploads/2021/09/Tanzania_SDS_Final-Public_Sep-30-2021.pdf

Procurement and Supply Management: Weaknesses in procurement and supply management (PSM) are considered to particularly hinder delivery of health services in Tanzania, including HIV and AIDS, TB, and malaria services. (Hickman et al., 2014).

Tanzania's medical supply chain system has become more efficient and effective at ensuring essential medicines and medical supplies reach everyone in the country. However, challenges remain, especially in terms of reaching the hardest to reach in rural and more remote regions (Reach Project, 2020). Internally driven improvements within the Medical Stores Department (MSD) and contributions from external partners such as USAID, Project Last Mile (PLM), John Snow Incorporated (JSI), and the Global Fund have gradually improved the reach of the country's medical supply chain system (Reach Project, 2020).

Despite improvements made by the Medical Stores Department (MSD), government officials, international organisations, as well as external consulting firms highlight several bottlenecks and inefficiencies that persist in Tanzania's public medical supply chain system. Critical assessments focus on specific challenges in operational inefficiency and poor data quality (Reach Project, 2020). In response, the government redesigned the system with pilot programs rolling out in 2019. The redesign aimed to continue improving the medical supply chain system's performance, ensuring medical commodities reach health facility and patient, regardless of where they are located (Reach Project, 2020).

Laboratory facilities: Strong health laboratory systems and networks capable of providing high quality services are critical components of the health system and play a key role in routine diagnosis, care, treatment and disease surveillance. A paper by Mboera et al. (2015) found that a well-established National Health Laboratory System was in place in Tanzania, however, the coordination of HIV laboratory services was found to be weak. The authors reported that whilst in

most laboratories, guidelines for HIV diagnosis were available, health care providers were not aware of their availability. The authors continued that the utilisation of the guidelines for HIV diagnosis was higher at national level than at the lower levels. The low level of awareness and utilisation of guidelines was associated with inadequate training and supervision. There was a shortage of human resource, mostly affecting the primary health care level of the system and this was associated with inequity in employment and training opportunities. Laboratories in public health facilities were better staffed and had more qualified personnel than private-owned laboratories (Mboera et al., 2015).

Data management: A national health management information system (HMIS) was rolled out to all regions in 1997. Since the introduction of this HMIS (the MTUHA system), there were limited comprehensive revisions (USAID, 2013). The expansion of reportable conditions and the advent of vertical programs with their associated demands for data rendered the HMIS inadequate, resulting in multiple and duplicative data collection and reporting subsystems. With scarcity of staff and other resources, these subsystems rendered the MTUHA unresponsive to the information needs of the Ministry of Health and captured data was not only inaccurate but also incomplete and reported late. In response, the Government of Tanzania placed importance on the functioning of the Health Management Information System, reflected in the Health Sector Strategic Plan III (2009-2015) (USAID, 2013).

In response to these challenges, the Government of Tanzania initiated a comprehensive modernisation and strengthening of all aspects of monitoring and evaluation within the Ministry of Health. This project included strengthening the HMIS to improve data collection, reporting, and use for decision making at all levels of the health system (USAID, 2013). It aimed to integrate and harmonise existing subsystems, which had been created in an attempt to respond to the deficiencies of the main HMIS (USAID, 2013).

Access to healthcare: Physical access to health services has significantly improved in Tanzania with the construction and renovation of PHC facilities in rural areas. Most people are living within 5 to 10 km from a clinic (World Bank, 2015). On the demand side, there have been various initiatives to:

- provide cash transfers to extremely poor households conditional on their utilization of health services; and
- enroll such poor households in Community Health Funds to provide financial protection (World Bank, 2015).

5. Vertical care challenges

Historically, globally donors and multilateral organisations have channelled funding in health through vertical disease programs, typically focussed on one disease area and a set of short- and medium-term objectives. While vertical programs present many advantages (e.g. ease of management, greater accountability, strong financial control), they have been subject of controversy. The most commonly discussed problems with vertical programs are (i) creation of parallel systems for funding and management, (ii) distortion of national priorities and (iii) lack of contribution to overall strengthening of the healthcare system (Glassman et al., 2020).

Effective supportive supervision of healthcare services is crucial for improving and maintaining quality of care. However, this process can be challenging in an environment with chronic

shortage of qualified human resources, overburdened healthcare providers, multiple roles of district managers, weak supply chains, high donor fragmentation and inefficient allocation of limited financial resources (Renggli et al., 2018).

With support from the USAID, PATH worked with the Tanzania Ministry of Health to introduce tuberculosis (TB) and HIV collaborative activities beginning in 2005. Since then, PATH's activities in supported regions have resulted in (PATH, nd.):

- Almost all TB patients being tested for HIV.
- A tripling of the rates of antiretroviral therapy (ART) use among TB/HIV co-infected patients.
- An innovative model for management of TB/HIV co-infection that can be adapted for use in other countries.

In the year 2018, 73,669 (99%) of new and relapse cases notified had their HIV test results recorded at time of notification. Among the tested, 20,714 (28%) were tested HIV positive. The co infection rate has decreased from 31% in years 2017. Furthermore, analysis shows that among co-infected cases 20,371 (98%) cases were initiated or were on ART at both TB clinic and CTCs and 19,226 (93%) were put on Co-trimoxazole Preventive Therapy (CPT). NTLP (Website) reports that uptake of ART has increased from 83% in 2014 to 98% in 2018.

7. Surveillance challenges

Disease surveillance is a cornerstone of outbreak detection and control. Evaluation of a disease surveillance system is important to ensure its performance over time. The Government of Tanzania adopted the Integrated Disease Surveillance and Response (IDSR) system as the platform for all disease surveillance activities in the country. Tanzania's IDSR guidelines include surveillance and response protocols for 34 diseases and conditions of public health importance (Nkowane, 2019). They outline, in detail, necessary recording and reporting procedures and activities to be taken at all levels of the health system to achieve timely detection, investigation, and response to outbreaks and emergencies, and avert disease and mortality. Over the years, IDSR procedures and the structures that support them have received significant government and external resources to maintain and strengthen detection, notification, reporting, and analysis of surveillance information.

However, with the phasing out of programs (such as the Global Polio Eradication Initiative program) that have supported vaccine-preventable disease (VPD) surveillance system strengthening and maintenance in the past, resources for surveillance will become more limited, and the government will need to identify additional resources to sustain the country's essential surveillance functions (Nkowane, 2019).

A summary description of the disease surveillance system in Tanzania is provided in the table below. Nkowane (2019) concludes that overall, the structures for a well-performing surveillance system appear to be in place. Key strengths, weaknesses, opportunities and threats are outlined below (Nkowane, 2019- see table 3):

Table 3: Strengths, weaknesses, opportunities, and threats analysis of disease surveillance systems in Tanzania

Source: Nkowane, 2019: 11. This table has been removed for copyright reasons. The table can be found at <https://www.mcsprogram.org/resource/streamlining-and-strengthening-the-disease-surveillance-system-in-tanzania/>

In terms of local performance, Saleh et al. (2021) assessed the core and support functions of the Zanzibar integrated disease surveillance and response (IDSR) system to determine its capacity for early detection of and response to infectious disease outbreaks. The authors concluded that the IDSR system in Zanzibar is weak and inadequate for early detection and response to infectious disease epidemics. They note that the performance of both core and support functions are hampered by several factors including inadequate human and material resources as well as lack of motivation for IDSR implementation within the healthcare delivery system.

6. Community awareness and knowledge

Challenges to health-literacy in Tanzania include inaccurate, inconsistent, untrustworthy, unreliable, untimely, contradictory, and confusing information. Additional challenges include language barriers; high cost of internet, poor connectivity, the ratio of healthcare providers to patients, poverty, and traditional beliefs (Shamsudeen & Rajabu, 2020).

In Tanzania, 60.6 % of PLHIV ages 15 years and older are aware of their HIV status: 64.9% of HIV-positive females and 52.2% of HIV-positive males. Awareness was defined as self-reporting HIV-positive status and/or having a detectable antiretroviral (ARV) in the blood following laboratory testing (Ministry of Health, 2018). By 2020, 90% of all PLHIV will know their HIV status; 90% of all people with diagnosed HIV infection will receive sustained antiretroviral therapy (ART); and 90% of all people receiving ART will have viral suppression (Ministry of Health, 2018).

Men have lower awareness of their HIV status than women. Men also have lower linkage to treatment (2nd 90) and viral load suppression (3rd 90) compared to women. HIV prevention among women and rapid acceleration of HIV diagnosis, combined with improved linkage to treatment and viral load suppression among men is critical for epidemic control (Ministry of Health, 2018).

Stigma: Stigma and discrimination have been firmly established as key barriers that hinder disease prevention and negatively impact all stages of the treatment (Katz et al., 2013). From June 2017 to September 2018, the Health Policy Plus (HP+) project, funded by USAID and the PEPFAR, worked with local partners in Tanzania to adapt and implement a total facility approach to reduce HIV related stigma and discrimination in health facilities. When discussing stigma associated with medical staff treating HIV they identified the following issues (HP+, 2018):

- 55% of staff reported worry about workplace HIV transmission;
- 86% of clinical staff reported engaging in stigmatising avoidance behaviour (double gloving, avoiding physical contact, extra precautions);
- 97% of staff expressed at least one stigmatising attitude about people living with HIV (youth and adults);
- Confidentiality is a significant issue: Over 50% of staff questioned confidentiality of HIV test results;

- 38% of youth and 32% of adults don't believe that HIV status records are kept confidential;
- 42% of staff are hesitant to test for HIV in their facility;
- In the past three month staff had observed discrimination toward adults (29%) and youth (38%) living with HIV;
- 16% of adults living with HIV were not using the closest HIV clinic; over half cited stigma as a key reason.

Closing space for civil society: Poverty, poor institutional and infrastructural support, and social and cultural neglect are impeding an effective and progressive HIV response in Tanzania. In 2017, Civicus, the global alliance of civil society organisations and activists dedicated to strengthening citizen action and civil society, placed the country on a watch list due to growing threats to civic space. In February of the same year, the government closed 40 healthcare facilities providing HIV services under the premise that they were promoting homosexuality. In June 2017, President Magufuli severely criticised NGOs working for the rights of LGBTI people (CIVICUS, 2017).

In 2018, Tanzania's sustained anti-gay crackdown was part of a broader trend of suppression and a disappearing civil society voice. The repercussions have been felt through all key population groups, affecting access to HIV and sexual health services, and increasing stigma and discrimination. It has also resulted in hundreds of LGBT activists going into hiding in order to avoid punishment (Avert, 2020).

Cross cutting the above challenges, COVID-19 has had a detrimental impact on, ongoing initiatives. For example, additional plans for the scale-up of differentiated service delivery models for dispensing of ARVs to other regions in COP20 met delays due to COVID-19. In terms of Malaria, planned ITN distribution in 2020 was not realised in Tanzania, delivering 98% of the nets planned for distribution in 2020 in that year; the remaining nets were delivered in 2021 (WHO, 2021).

The Global Fund and the Government of Tanzania are deepening their partnership with new investments to fight the COVID-19 crisis and accelerate the end of the epidemics of HIV, TB and malaria while building resilient and sustainable systems for health.

The new funding for COVID-19 comes on top of US\$608 million that was approved for the 2021-2023 implementation period. The grants seek to support Tanzania's efforts to build resilient and sustainable systems for health and expand access to HIV, tuberculosis and malaria services through four strategic initiatives: finding missing cases of TB, scaling up prevention services for adolescent girls and young women, increasing access to TB preventive treatment for people living with HIV, and HIV self-testing (Reliefweb, 2020).

Part III: Select Interventions

7. Health systems governance and capacity

The health sector is considered to be a key sector for the Tanzanian government and is identified in the National Development Vision 2025 as a priority area⁶. There are two primary policy documents that drive Health sector activities. These are the National Health Policy (NHP) of 2017 (Ministry of Health, 2017) and the Health Sector Strategic Plan V (HSSP V) (Ministry of Health, 2021). The NHP provides the overarching guidance toward the improvement and sustainability of the health of Tanzanian citizens through reductions in disability, morbidity, and mortality, improvements in nutritional status, and increased life expectancy. A goal of the HSSP V is to improve health financing:

- Domestic General Government Health Expenditure as percentage of GDP to increase from 2.6% to 5.0%;
- Health insurance coverage to increase from 14% to 58%.

The Tanzania Public Health Act of 2009 is also an important enforcement mechanism, which defines roles and responsibilities of the Ministry of Health and other relevant authorities for dealing with the prevention and management of communicable and non-communicable diseases, hygiene in both public and private spaces, waste management, and reporting requirements as related to these issues.

The National Health Policy (NHP) of 2017 provides details for institutional arrangements for health services at the three administrative levels, national, regional and district, through which the provision of health services are provided. The main emphasis of the policy is to specify which duties are to be undertaken at each of these administrative levels.

- At the national level, primary responsibilities are formulating policy and legislation, resource mobilisation, mobilising public health interventions, management of national hospitals, training, monitoring and evaluation, and research.
- At the regional level primary responsibilities include supervising health service provision, mobilising resources, providing technical support, and interpreting policies for implementation at district and sub-district levels.
- The district level is the level at which primary health services are provided and other health interventions are implemented and where implementation and reporting are undertaken. The district level is also responsible for communicating directly with communities.

Health Sector Strategic Plan V recognises that health is a valuable individual asset enabling people to better contribute to social development and that improved health and social wellbeing of the nation are essential in realising the National Development Vision 2025. An overall objective of HSSP V is to reach all households with essential health and social welfare services, meeting, as much as possible, the expectations of the population, adhering to objective quality

⁶ <https://mof.go.tz/mofdocs/overarch/vision2025.htm>

standards, and applying evidence-informed interventions through efficient channels of service delivery.

The Health Policy Project – HPP (subsequently HP+) supported the Tanzanian Ministry of Health in conducting a rapid Health Systems Strengthening assessment comprising a desk review and structured stakeholder consultations (HPP, 2014). The WHO's six health system strengthening building blocks provided a framework for the assessment.

- supply chain/pharmaceuticals,
- HRH,
- information systems,
- healthcare financing,
- leadership and governance,
- infrastructure.

The assessment identified 32 HSS priorities, nine of which were recommended by the Ministry of Health and all other stakeholders for consideration for Global Fund support (HPP, 2014). An overview of the challenges and recommendations are provided below:

Pharmaceuticals and Supply Chain Management: HPP (2014) comment that weaknesses in procurement and supply management (PSM) hinder delivery of health services in Tanzania, including HIV and AIDS, TB, and malaria services. In the initial ranking exercise, 100% of stakeholders listed stockouts as a key barrier. HPP (2014) reported that in 2012, 20–30% of hospitals were out of stock of four out of fourteen common items, and 40–50% lacked a further six items. In March 2013, only 19.4% of facilities reported no stockouts of ten tracer items. Malaria rapid diagnostic tests were among the least-available items. Strategic plans for HIV and malaria note stockouts as a barrier hindering service provision. Contributing factors identified in the Pharmaceutical Sector Action Plan 2014–2020 include:

- de-capitalisation of MSD (Medical Stores Department),
- performance and capacity issues at different levels
- inadequate coordination amongst stakeholders within and outside the Ministry of Health,
- challenges related to governance and accountability

HPP (2014) identified the following priority actions would address several of these factors, reducing stockouts and strengthening service delivery:

- Institutionalize a functioning Logistics Management Unit (LMU) supported by an electronic logistics management information system (e-LMIS).
- Strengthen the Medical Stores Department (MSD)

Human Resources for Health (HRH): HPP (2014) comment that Tanzania faces a HRH crisis. The health workforce is at 58% of estimated need (MOH, 2013) and inequitably distributed, with significant regional disparities and acute shortages in rural areas and among particular health cadres (e.g., an 87% gap for social workers) (HPP, 2014). The substantial impacts of the HRH crisis on HIV and AIDS, TB, and malaria programs are widely recognised, and current strategic plans for all three diseases cite HRH as a critical barrier.

The HPP assessment identified three priority HRH actions:

- Design and implement a targeted health worker retention approach in hard-to-reach areas
- Design and implement a targeted health worker retention approach in hard-to-reach areas
- Harmonise community health worker curricula and support implementation of training

Information (Health Management Information Systems and Monitoring and Evaluation):

Stakeholders expressed two pressing concerns 1.data quality and 2. harmonisation/integration of parallel systems—and identified two priority actions:

- Strengthen the integration and interoperability of existing information systems, including the establishment of an electronic integrated disease surveillance and response system (eIDSR) linked to HMIS (eIDSR):
- Improve data quality through: (i) supportive supervision and Data Quality Assessments; (ii) integration of a routine data verification system into HMIS/DHIS 2;

Healthcare Financing: Healthcare financing is one of the most pressing concerns affecting the sustainability of Tanzania’s health system. Real-term public health expenditures have remained flat since 2009–2010, and government spending fell from 66% of overall health spending in 2007–2008 to 59% in 2010–2011. HPP (2014) recommend the following:

- Finalise and operationalise a national healthcare financing strategy,
- Support national scale up of a results-based financing program.

A cross-cutting issue identified by HPP (2012) that cuts across the health system strengthening building blocks was also identified, namely:

- Support national scale up of a results-based financing program.

In terms of implementation of key policies, The Government of Tanzania has initiated key policy revisions to move Tanzania closer to epidemic control for example, through provision of updated circulars and revised National Guidelines for the Management of HIV and AIDS (2019) after the COP19 Regional Planning Meeting in Johannesburg. This included:

- updating same-day ART initiation from 14 days to within seven days,
- implementing six-month multi-month dispensing (MMD),
- the release of new HIV Testing Guidelines 2019.

In terms of HIV/AIDS, Tanzania has received substantial external financing for its national response since the establishment of PEPFAR and the Global Fund. Cross-cutting investments from HIV funding sources have strengthened the health system. However, insufficient investments in HIV and the health sector, in general, have prevented Tanzania from reaching its full potential for sustaining the HIV national response (PEPFAR, 2020 – see figure 5). The strongest scores are coded dark green (8.5- 10 points) which represents sustainability strength, while the next category is light green (7.0- 8.49) which signifies elements that are approaching sustainability, yellow scores (3.50-6.49) are representatives of areas of emerging sustainability, and red scores signify the weakest score (less than 3.5 points). The lower scores demonstrate areas of vulnerability that require continued significant investments, while the higher scores (light and dark green) demonstrate areas of improving sustainability - thus requiring limited investment.

Figure 5: **Tanzania Sustainability Index and Dashboard**

Source: PEPFAR, 2020: 19. This figure has been removed for copyright reasons. The figure can be found at <https://www.state.gov/wp-content/uploads/2020/07/COP-2020-Tanzania-SDS-FINAL.pdf>

8. Integrated care

The Ministry of Health is implementing a National Strategy for Coordinated Response to Tuberculosis and leprosy, which will guide implementation of ACSM in TB interventions in the country. The strategy outlines the following five-point framework for ACSM action to ensure that health care workers, decisionmakers, and communities are engaged effectively (NTLP Website):

- Improving case detection and treatment.
- Combating stigma.
- Empowering people affected by TB, MDR TB, TB/HIV etc.
- Mobilising resources from the community.
- Advocating for political commitment and leadership.

The National Tuberculosis and Leprosy Programme (NTLP) was launched by the Ministry of Health and Social Welfare in 1977 to fight TB and Leprosy in Tanzania. Since then, NTLP has collaborated with international and local development partners in an effort to prevent and control TB and leprosy to the point that they are no longer a public health concern. Treatment success rate among new TB cases has risen from 78% in 2000 to 89% in 2010 to 93% in 2019, alongside a rising number of total notified patients during this time (World Bank Data⁷).

Training: PATH has collaborated extensively with local and national partners, health care programs, and international partners to implement a coordinated response across Tanzania's entire health system. Their efforts aimed to scale up and improve integrated services, strengthen the private-sector delivery of TB services, enhance health professionals' ability to identify and track cases and provide treatment, improve laboratory diagnostic services, and engage and educate communities (PATH, 2016).

PATH has identified that health care workers' capabilities are critical in expanding integrated TB–HIV services. With PATH's support, Tanzania has trained almost 600 health workers to offer integrated services, and TB–HIV services have been introduced at nearly 200 public sector facilities and 70 private-sector facilities in nine of 26 regions throughout the country (PATH, nd). The private sector contributes approximately one-third of integrated services within the project regions, all at minimal cost to the patients. PATH worked with partners to hire district and zonal TB–HIV coordinators who provide critical on-the-job training and supportive supervision to health workers. These coordinators have been instrumental in expanding and advocating for more services, monitoring service implementation, and mobilizing resources (PATH, nd).

⁷ <https://data.worldbank.org/indicator/SH.TBS.CURE.ZS?locations=TZ>

9. Surveillance

As noted above, the Government of Tanzania adopted the Integrated Disease Surveillance and Response (**IDSR**) system as the platform for all disease surveillance activities in the country. Tanzania's IDSR guidelines include surveillance and response protocols for 34 diseases and conditions of public health importance.

However, Tanzania has limited capacity, especially at community level, to detect outbreaks and this weakens its ability to promptly respond and control public health threats or events in a timely fashion (CDC, 2016).

In Mainland Tanzania, the malaria surveillance is part of the Ministry of Health's weekly electronic Integrated Disease Surveillance and Response (e-IDSR), a system linked to the District Health Information Software, version 2 (DHIS 2) platform. The e-IDSR system uses mobile phone technology that is commonly used in mobile money transfer (unstructured supplementary service data). At health facilities, registered users can submit weekly reports that can be viewed in DHIS 2 and accessed by officials at district, regional, and national levels (Measure, 2018).

The MEEDS system is based on the weekly mobile reporting of malaria data by health facilities. The frequent reporting enables surveillance, monitoring, and evaluation (SME) teams to detect outbreaks within two weeks of onset and helps them decide what actions are needed when a sudden increase in malaria transmission is identified (Measure, 2018).

In Mainland, the average reporting rate across the regions implementing e-IDSR improved from 30% in August 2016 to 75% in July 2018. NMCP's national target is 90% while the World Health Organization has a target of 80%. In Zanzibar, the average malaria case reporting rate through MEEDS also improved. Unguja (Zanzibar Island) moved from a 69% reporting rate in July 2017 to 86% a year later. Pemba Island went from 58% in July 2017 to 93% in July 2018. Training in data analysis and data use, strengthened supportive supervision, and feedback meetings with district malaria surveillance officers contributed to these improvements (Measure, 2018).

10. Education and communication

Advocacy, communication, and social mobilisation (ACSM) has been identified by the WHO as a critical component of effective control of TB. The Ministry of Health is committed to integrating ACSM into health planning and programming. ACSM has three distinct sets of activities which have the shared goal of bringing about behavioural change (NTLP Website):

- **Advocacy:** Primarily works to change the behaviour of public leaders or decision-makers.
- **Communication:** Generally, targets individuals or small groups in the public.
- **Social mobilisation:** Aims to secure community-based support.

Interventions under one area may beneficially influence or facilitate processes in the other areas. ACSM complements the health system in achieving TB control through empowering communities, garnering political and financial support, and addressing the challenges of individual and social behavioural changes. These challenges include (NTLP Website):

- Delayed health-seeking behaviour.

- Inadequate access to TB diagnostic health facilities.
- Inadequate knowledge of TB symptoms and signs.
- Stigma and discrimination.
- Misconceptions and myths surrounding TB.
- Poor adherence to TB treatment.
- Insufficient resource allocation to TB control.

Stigma and discrimination is also a major challenge, particularly in relation to HIV. In 2016/17, around 25% of those surveyed for the country's HIV Impact Assessment demonstrated discriminatory attitudes towards people living with HIV (Ministry of Health, 2019).

While Tanzania has a fairly broad sex education curriculum, only a third of schoolteachers have been trained on how to deliver these lessons, meaning access is patchy. In addition, certain subjects, such as the examination of minority sexualities, are not covered. Condom demonstration and condom distribution is also not allowed during sex education lessons (Avert 2020).

The Bill and Melinda Gates Foundation (2017) commissioned a study on the state of condom programming for HIV prevention in five sub-Saharan countries (including Tanzania). The conclusion of the study was that there is room to further increase condom use in line with national strategy and the high HIV prevalence among key populations. The Tanzanian government recognises condom promotion as an integral part of its fight against the epidemic. The goal of its 2017-2022 HIV prevention strategy is to ensure 85% of people engaged in multiple sexual partnerships use condoms correctly and consistently (Ministry of Health, 2017a).

Voluntary medical male circumcision (VMMC): Circumcision is an effective HIV prevention strategy, reducing a man's risk of acquiring HIV by approximately 60%. When used in combination with other prevention measures, circumcision is an important addition to HIV-prevention options for men (Avert, 2020). In 2010 the government prioritised 11 regions for scaling VMMC and set a target of 2.8 million circumcisions by 2016.60 Around 2.6 million men were circumcised between 2015 and 2018, equating to around 80% of 15 to 49-year-old men (UNAIDS, 2019).

Although a number of HIV prevention programs have been implemented, such as mass media campaigns, high rates of unprotected and concurrent sexual partnerships, as well as low uptake of HIV testing and limited HIV knowledge, persist in Tanzania. Siril et al., (2019) examined the effect and predicting factors of HIV prevention communication among people living with HIV (PLH) exposed to *NAMWEZA* intervention, and their at-risk social network members (NMs). Quantitative data were collected from participants at baseline and 24 months of follow-up. In-depth interviews were conducted at follow-up. Results indicated specific communication about condom use and HIV testing increased; while general discussion about protecting other people from HIV did not change significantly. Positive predictors of communication included being single, female; aged 30 years or older, HIV knowledge, dose of *NAMWEZA* participation; and high self-efficacy for condom use. Stigma demonstrated a significant but negative association with communication for condom use. Qualitative data reflected perceived possession of more individual skills and ability to address some personal/cultural obstacles to communicating about HIV prevention including those observed in the quantitative data. *NAMWEZA* improved communication about HIV prevention among PLH with their at-risk-NMs. The authors conclude that their approach is a promising complement to media campaigns in similar populations and

that future research and program evaluation efforts should explore how communities perceive and communicate about protecting others from HIV.

A growing body of evidence investigates how entertainment education influences knowledge about HIV, stigma toward those with HIV, and openness to disclosing one's HIV status. A study undertaken by Green et al., (2021) shows that in addition to these effects, mass media interventions may influence audiences' policy priorities, such as their demand for local access to HIV/AIDS medical care. In this study, a condensed (2 hours) version of a popular Swahili radio drama was presented to rural Tanzanians as part of a placebo-controlled experiment, clustered at the village level. A random sample comprising 1,200 participants were interviewed at baseline and invited to attend a presentation of the radio drama. Baseline respondents were reinterviewed 2 weeks later. In addition to increasing listeners' knowledge and support for disclosure of HIV status, the radio drama produced sizable and statistically significant effects on listeners' preference for HIV/AIDS treatment.

11. Disease specific interventions

Malaria

Tanzania Ministry of Health. National Malaria Control Programme: Tanzania is one of the countries currently pursuing malaria elimination by 2030, building on the significant gains achieved since the late 1990s (Finda et al., 2020). To achieve malaria elimination, the National Malaria Control Programme has adopted a strategy to ensure adequate coverage of vector control interventions, primarily the use of LLINs and IRS. The strategy includes improved malaria diagnosis and case management, as well as roll-out of new complementary interventions where there is sufficient local evidence for impact. Key results include (Ministry of Health, 2018a):

- 78% of households in Tanzania own at least one ITN. Households in urban areas are more likely to own an ITN than those in rural areas (81% and 77%).
- The mean number of ITNs per household is 1.8
- 52% of the household population slept under an ITN the night before the survey
- 56% of women age 15-49 with a live birth in the 2 years preceding the survey received 2 or more doses of SP/Fansidar (IPTp2+) to prevent malaria.

Tuberculosis

Toolkit for Quality Improvement (QI) in TB Case Detection: In 2016 a national assessment was undertaken during which overall health systems functions were examined, along with health facility practices and capacity to implement TB case detection interventions. Four evidence-based prioritised approaches were developed to scale-up TB case detection throughout the country (Global Fund, 2018).

A Toolkit for Quality Improvement (QI) in TB Case Detection was developed along with a training package, data collection tools (e.g., presumptive TB register), and job aides (e.g., leaflets, brochures, and posters) for health facility managers, health care providers, and patients. The overall aim of the toolkit was to ensure that TB case detection activities become part of the routine standard of care and, therefore, sustainable. Despite the barriers and quality of care issues that were identified through the pilot, the findings after one year of implementation revealed considerable increases in TB case detection in intervention facilities (Global Fund, 201

Among the intervention sites registered in the pilot an 81% cumulative increase in the notified TB cases was recorded. After 18 months of implementation, the national TB case notification increased from 62,180 in 2015 to 69,818 in 2017 with approximately 4,000 additional cases reported in 2018 (Wandwalo et al., 2020).

TB preventive treatment: PEPFAR note that the Government of Tanzania is supportive of ongoing efforts to scale-up TB preventive treatment (TPT) to more than 75% of eligible clients on IPT. PEPFAR/T aims to achieve 100% IPT coverage of all eligible clients during COP21 by working in close collaboration with the government to ensure a reliable supply of Isoniazid to increase the number of clients enrolled in and completing IPT (PEPFAR, 2021).

HIV/AIDS

Targeted facility and community-based HIV testing: During the financial year 2019, the Government of Tanzania adopted and implemented differentiated service delivery models, including six-month/multi-month/and three-month dispensing of ARVs. Three month multi-month dispensing continues throughout the country, while six-month multi-month dispensing in Dar es Salaam, initially beginning in 2019, is still ongoing (PEPFAR, 2021).

PEPFAR (2021) note that following the release of the January 2020 circular authorising scale up of Dolutegravir (DTG) to all PEPFAR supported facilities, the Government of Tanzania and PEPFAR's collaborative efforts to support accelerated uptake of optimised DTG-based regimens across all age groups has shown continued success, where almost 90% of eligible women of childbearing age and adults were on optimised regimens by the end of the country operational plan 19 (COP19).

Self testing: The Government of Tanzania has also adopted amendments of the HIV and AIDS Prevention and Control Act (HAPCA) to allow for HIV self-testing in adults and lowering the age of consent for HIV testing from 18 to 15 years (approved in November 2019). More data is needed to ascertain the effectiveness of this intervention.

Test and treat guidelines: Tanzania has significantly scaled up its antiretroviral (ART) programmes in recent years, and the number of people on ART has been steadily increasing since 2010. In 2017, Tanzania introduced the World Health Organization (WHO) recommended 'test and treat' guidelines, which makes anyone testing positive for HIV eligible for immediate treatment regardless of the level of HIV in their body (Ministry of Health, 2017). This has seen ART coverage expand significantly: in 2018, 71% of people living with HIV in Tanzania were receiving ART, equivalent to 1.1 million people. This is around a 20% increase from 2015, when 52% of HIV-positive people were on ART (UNAIDS, 2019). As of 2018, around 90% of people diagnosed with HIV began ART in less than seven days (PEPFAR, 2019).

Antenatal care: One of the reasons for HIV transmission still occurring vertically (from parent to child) is that not all pregnant women are tested for HIV. In 2018, 91% of pregnant women attending antenatal services received HIV testing. In addition, only half (47%) of infants exposed to HIV during pregnancy were tested for HIV within eight weeks of birth (known as 'early infant diagnosis') (Avert, 2020; Ministry of Health, 2013a). To reach as many women as possible, the vast majority of PMTCT services are now integrated with reproductive and child health services (Ministry of Health, 2013a).

Odjidja et al. (2019) report that Tanzania has adopted WHO's latest antenatal care (ANC) guidelines which recommend comprehensive services including diagnostic screening and

treatment for pregnant women during antenatal care. Such provision visits purportedly increase the HIV testing rate among mothers age and enrolment in paediatric ART (Bergmann et al., 2017). Using the provision of ANC to improve HIV screening needs to be carefully planned, however, with a need to ensure acceptance by mothers and healthcare staff (Odjidja et al, 2019).

Significant progress that has been made in the prevention of mother-to-child transmission (PMTCT) in the past few years in Tanzania. In 2018, 93% of pregnant women living with HIV were receiving effective ART, compared to 75% in 2010. It is estimated that ART coverage among pregnant women living with HIV has averted around 14,000 new infections among newborns. However, 8,600 children still acquired HIV in 2018 (Ministry of Health, 2017a).

Odjidja, et al. (2019) conclude that the integration of health services can be an effective mechanism to increase coverage and to reduce the impact of infectious diseases during pregnancy. The authors found that the strongest determinant of receiving integrated care during antenatal session was having a trained staff in all disease areas on site. Unexpectedly, the authors found that having antenatal care services and ID service on the same site had no association to receiving integrated care.

Cash Transfers: Cash transfer programmes form part of a new arm of HIV prevention that focuses on integrated programmes for social protection schemes and sexual health. Across sub-Saharan Africa these types of programmes have been shown to have a positive effect on preventing HIV and other sexually transmitted infections (STIs) (Avert, 2020).

In one Tanzanian pilot, cash incentives of US\$10 or US\$20 were given to young adults aged between 18 and 30, as long as they were free from STIs. One year into the study, there was a 25% risk reduction in STIs. These programmes show that economic benefit can positively influence people to use condoms more frequently (Heise, et al. 2013).

In 2017 the Tanzanian government, in collaboration with UNICEF, began a cash transfer scheme called Cash Plus as part of a programme to empower and strengthen the resilience and wellbeing of adolescents from the country's poorest households. Cash Plus participants receive tailored, life skills training on various subjects, including sexual and reproductive health, as well as being linked to sexual and reproductive health and HIV services. They also receive financial support to either stay in school or start a small business and are supported by mentors and peer educators throughout (UNICEF, 2017).

Harm reduction: In 2011, with assistance from PEPFAR, Tanzania became the first country in sub-Saharan Africa to implement a harm reduction programme for people who inject drugs (WHO, 2018). A methadone treatment clinic opened up in Tanzania's largest health facility, based in Dar es Salaam, then extended to a second hospital in the city. Although there has since been an increase in opioid substitution therapy (OST) interventions outside Dar es Salaam, access remains limited, with just 20% of people who inject drugs able to access OST in 2018 (WHO, 2018).

However, Harm Reduction International (2018) reports that the Tanzanian government has taken "regressive steps" in its harm reduction-related policy in recent years, with policy-makers continuing to favour abstinence-based approaches above harm reduction.

Pre exposure prophylaxis (PrEP): In 2018 Tanzania began to scale up pre-exposure prophylaxis (PrEP) for key populations. The following year, the government announced plans to

extend this nationwide, including expanding eligibility criteria to include adolescent girls and young women (PEPFAR, 2019).

As of 2019, it was estimated that between 3,200 and 3,700 people were using PrEP in Tanzania. The majority of these people are adolescent girls and young women, although female sex workers and their partners and the HIV-negative partners of people living with HIV are also being targeted by implementation or demonstration projects (Avert, 2020).

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