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Foreword

Since 1984, when HIV was first detected in Thailand, almost 1.4 million of the estimated 3.5 million people living with HIV in the WHO South-East Asia Region are on HIV treatment as of 2015. From over 200,000 annual AIDS-related deaths at the peak of the epidemic in 2005, mortality is now down to 130,000 annually. Prevention interventions combined with expansion in treatment have led to a decrease in new infections from over 300,000 a year in 2001 to 180,000 in 2015.

Despite low general prevalence, the HIV epidemic in the Region is concentrated among key populations. Of people living with HIV, 99% are found in five member states – India, Indonesia, Myanmar, Nepal and Thailand. While member states in the Region have made progress in the health-sector response to HIV, more needs to be done and at an increased pace if we are to achieve the 2020 target of 90-90-90, that is: 90% of people living with HIV tested; 90% of those identified on treatment; and 90% of those on treatment virally suppressed. Having committed to Sustainable Development Goal target 3.3 of ending AIDS as a public health threat by 2030, this interim 2020 goal is a key milestone. It will require scaling up HIV prevention, testing, treatment and retention in care through innovative service delivery models in partnership with communities and ensuring sustainable financing through inclusive and integrated service provision within the Universal Health Coverage framework, as outlined in the WHO Global Health Sector Strategy 2016–2021.

This supplement, with articles from national HIV programmes, describes the HIV epidemic and response within member states of the Region. I hope that it will provide insights into key issues and challenges on strategies and interventions implemented, lessons learned and actions needing further and urgent attention for policy-makers, governments, development partners and civil society to fast-track the response towards ending AIDS by 2030.



P. Khetrpal

Dr Poonam Khetrpal Singh
 WHO Regional Director for South-East Asia

Aims and objectives

The aim of this journal is to provide a specialist, open access forum and fast-track pathway to publish work in the rapidly developing field of virus eradication, particularly of HIV, HBV and HCV. The Journal has been set up especially for these and other viruses, including herpes and flu, in a context of new therapeutic strategies, as well as societal eradication of viral infections with preventive interventions.

Scope

The Journal not only publishes original research, but also provides an opportunity for opinions, reviews, case studies and comments on the published literature. It focuses on evidence-based medicine as the major thrust in the successful management of HIV and AIDS, HBV and HCV as well as includes relevant work for other viral infections. The Journal encompasses virological, immunological, epidemiological, modelling, pharmacological, pre-clinical and *in vitro*, as well as clinical, data including but not limited to drugs, immunotherapy and gene therapy. It will be an important source of information on the development of vaccine programmes and preventative measures aimed at virus eradication.

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What needs to be done in South East Asia to End AIDS?

Poonam Khetrapal Singh

Regional Director for South East Asia, World Health Organization

The countries of the South East Asia region (SEAR) confront a turning point in the fight against HIV. Progress over the last two decades in reducing new HIV infections and AIDS-related deaths – combined with the emergence of powerful HIV treatment and prevention tools – makes it possible to end AIDS once and for all in the region by 2030. However, achieving this goal will demand that SEAR countries heed warning signs of complacency and redouble efforts to reach those most in need with proven prevention and treatment interventions.

This is not the first time that SEAR has faced a moment of truth in the regional AIDS response. Two decades ago, the world's leading AIDS experts forecast that the epidemic would soon explode across South East Asia [1]. Although AIDS did evolve to become a serious health problem in the region, the startling escalation of the epidemic projected by experts did not occur, as countries across the region took action in the 1990s to fully leverage available prevention and treatment tools, focus programmes on those most in need, and base national responses on human rights and community involvement [2].

Although HIV prevalence in SEAR is lower than in sub-Saharan Africa, the region nevertheless accounts for roughly one in 10 people living with HIV worldwide [2]. The number of people newly infected with HIV in SEAR in 2015 was 47% lower than in 2000, but there are disturbing signs that progress on HIV prevention has slowed [2]. The number of new HIV infections in SEAR in 2015 (180,000) was only marginally lower than the number in 2010 (200,000) [2]. If AIDS is to be ended as a public health threat in SEAR, a rejuvenation of efforts is clearly needed. However, international HIV assistance is on the decline [3], and governments in the SEAR region have not stepped up domestic resource allocations that the fight against AIDS requires. [2].

While working to mobilise sufficient political will and financial resources to accelerate progress towards ending AIDS, decision-makers in SEAR need to take several key steps to enhance the public health impact of their efforts. First, all SEAR countries urgently need to embrace the 90-90-90 HIV treatment target and ensure that this approach is reflected in national policy and programmatic strategies. Although rapidly scaling up treatment towards the 90-90-90 target has the potential to sharply lower new HIV infections and AIDS-related deaths [4], HIV treatment coverage in SEAR (39% in 2015) remains lower than the global average for low- and middle-income countries (46%) [2]. Expediting progress towards Universal Health Coverage can help SEAR countries close the HIV treatment gap while laying a sustainable foundation to address the full array of regional health challenges.

Second, while scaled-up antiretroviral therapy is the single intervention likely to have the greatest impact on reducing new HIV infections [5], ending AIDS will also require much greater success in reducing the risk of HIV acquisition through primary prevention [6]. Weaknesses in primary prevention efforts in the region are apparent. Most countries in the region are not currently on track to eliminate new HIV infections among children, they have adopted widely variable approaches towards implementation of

validated harm reduction strategies to reduce new infections among people who inject drugs, and meaningful roll-out of pre-exposure antiretroviral prophylaxis (PrEP) has only just begun [2]. Countries in SEAR should immediately prioritise primary HIV infection measures, taking inspiration from Thailand's successful elimination of mother-to-child HIV transmission and from the region's previous prevention successes.

The third step that decision-makers in SEAR must take is to better target efforts on those most at risk. While progress in the regional AIDS response is clear, the most marginalised communities are being left behind. Even though transmission among such key populations as sex workers, men who have sex with men, people who inject drugs and transgender people are driving national epidemics across the region, only 24% of domestic HIV spending in Asia and the Pacific supports programming for key populations [2]. Focusing prevention and treatment resources on the populations and locations in greatest need not only enhances equity but also increases the public health impact of HIV spending as well as the return on investments.

Finally, the regional AIDS response needs to be firmly grounded in human rights and in the values of solidarity, inclusion and fairness. In addition to investing in anti-stigma programmes, implementing a rights-based response will also require legal reform in some countries. Six of the 11 SEAR countries criminalise same-sex relations, four impose criminal penalties for sex work, and four operate detention centres for people who inject drugs [2]. Unless they are repealed, such punitive laws and policies will continue to drive those most in need away from life-saving prevention and treatment services, undermining hopes for ending the epidemic.

The choice facing SEAR is clear. Either we renew our commitment, redouble our efforts and invest in smart programmatic choices to end AIDS once and for all, or we watch while the opportunity to end the epidemic evaporates. Even more concerning, modelling studies indicate that a failure to build on coverage gains achieved thus far will lead by 2030 to a worsening of the epidemic, effectively erasing the region's progress over the last 20 years [5].

We possess the means to win the AIDS fight, both globally and across SEAR. History will rightly judge us harshly if we let pass by this historic opportunity to build the foundation for a healthier world for future generations.

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HIV/AIDS in the South-East Asia region: progress and challenges

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Abstract

The South-East Asia region, with 11 member states, has an estimated 3.5 million people living with HIV (PLHIV). More than 99% of PLHIV live in five countries where HIV prevalence among the population aged 15–49 remains low but is between 2% and 29% among key populations. Since 2010, the region has made progress to combat the epidemic. Mature condom programmes exist in most countries but opioid substitution therapy, and needle and syringe exchange programmes need to be scaled up. HIV testing is recommended nationwide in four countries and is prioritised in high prevalence areas or for key populations in the rest. In 2015, PLHIV aware of their HIV status ranged from 26% to 89%. Antiretroviral therapy (ART) is recommended for all PLHIV in Thailand and Maldives while six countries recommend ART at CD4 cell counts <500 cells/mm³. In 2015, 1.4 million (39%) PLHIV were receiving ART compared to 670,000 (20%) in 2010. Coverage of HIV testing and treatment among HIV-positive pregnant women has also improved but remains low in all countries except Thailand, which has eliminated mother-to-child transmission of HIV and syphilis. Between 2010 and 2015, AIDS-related deaths and new HIV infections have shown a declining trend in all the high-burden countries except Indonesia. But the region is far from achieving the 90-90-90 target by 2020 and the end of AIDS by 2030. The future HIV response requires that governments work in close collaboration with communities, address stigma and discrimination, and efficiently invest domestic resources in evidence-based HIV testing and treatment interventions for populations in locations that need them most.

Keywords: HIV prevalence, testing, PMTCT, ART, viral load, key population

Introduction

The HIV/AIDS epidemic still remains a major public health concern in the World Health Organization (WHO) South-East Asia region (the region henceforth). The region, comprising 11 member states, is home to a quarter of the world's population and has the second largest HIV burden after sub-Saharan Africa. Even though HIV prevalence is low at 0.3%, an estimated 3.5 million (3.0 million–4.1 million) people are living with HIV [1]. There were an estimated 180,000 (150,000–210,000) new HIV infections and 130,000 (110,000–150,000) AIDS-related deaths in 2015 [1].

Since 2000, member states in the Region have made significant progress towards Goal 6 of the Millennium Development Goals (MDGs) [2,3]. Prevention and control of HIV has resulted in improved access to antiretroviral therapy (ART) and a decline in HIV-related illnesses, deaths and transmission. As the era of MDGs comes to an end and the Sustainable Development Goals (SDGs) [4] commence, it is time to assess the Member States' key achievements in the AIDS response in the last 5 years and identify the gaps and challenges they face. This article describes the current state of the HIV epidemic, the health sector response (inputs, outputs and outcomes along the HIV result chain) and impact of HIV programmes on epidemiological trends for the region and its member states (excluding the Democratic People's Republic of Korea) for the period 2010–2015. Such a review will help guide the HIV response in the near future in order to achieve the end of the AIDS epidemic by 2030 in the region.

Characteristics of the HIV/AIDS epidemic in the region

The epidemic is heterogeneous among and within the member states in terms of levels and trends. The number of people living with HIV (PLHIV) has remained more or less stable at 3.5 million (3.0 million–4.1 million) since 2005 and includes 1.3 million (1.1 million–1.5 million) women aged 15 years and above [1]. More

than 99% of PLHIV live in five countries: India, Indonesia, Myanmar, Nepal and Thailand (Table 1). With 2.1 million (1.7 million–2.6 million) PLHIV, India has the largest number of PLHIV in the region [5]. Five countries (Bangladesh, Bhutan, Maldives, Sri Lanka and Timor-Leste) together represent less than 1% of all PLHIV and has been categorised as a low-level epidemic in these countries. Less than 1000 people live with HIV in Bhutan and Timor-Leste (using data from 2014 as 2015 data are unavailable) [6,7]. The Democratic People's Republic of Korea has not reported any case so far.

HIV prevalence among the adult population aged 15–49, 0.3% in 2015, has remained low and stable across the region [1]. Thailand is the only country with an HIV prevalence of over 1% (Figure 1), which has declined from 1.7% in 2001 to 1.1% in 2015 [5]. The prevalence in India (0.26%), Myanmar (0.8%) and Nepal (0.2%) has remained almost the same during the period 2001–2015 [5,8]; however, it is showing an upward trend in Indonesia (<0.1% in 2001 vs 0.5% in 2015)[5]. There are geographical variations within countries as well, as demonstrated by high prevalence in the southern and northeastern states of India and in Papua and West Papua in Indonesia [8,9].

The five countries in the region with 99% of the HIV burden are experiencing concentrated epidemics among certain key populations that are at a high risk for acquiring HIV. These include sex workers (SW) and their clients, men who have sex with men (MSM), people who inject drugs (PWID) and transgender individuals. Prevalence rates among PWID were 10% in India, 19% in Thailand, 23% in Myanmar and 29% in Indonesia [5]. They are also high among MSM, ranging from 2.4% in Nepal to 26% in Indonesia [5] (Figure 1).

Health sector responses to HIV

HIV prevention for key populations

Condom programmes have been the cornerstone of HIV prevention in the region. The five countries with a concentrated epidemic have mature condom programmes for key populations and report high condom use among MSM and SWs [5]. Condom use was >80% for MSM in India, Indonesia, Nepal and Thailand, and >90% for

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Table 1. Epidemiology of the HIV epidemic in the WHO South-East Asia region and 10 member states, 2010–2015

Country	People living with HIV	AIDS-related deaths		New HIV infections (Total)		New HIV infections in children (0–14)	
	2015	2010	2015	2010	2015	2010	2015
Bangladesh	9600	<1000	<1000	1400	1100	<100	<100
Bhutan	<1000	NA	NA	NA	NA	NA	NA
India	2,100,000	120,000	68,000	100,000	86,000	15,000	10,000
Indonesia	690,000	18,000	35,000	69,000	73,000	3000	5,000
Maldives	NA	NA	NA	NA	NA	NA	NA
Myanmar	220,000	16,000	9700	15,000	12,000	1800	<1,000
Nepal	39,000	2600	2300	2300	1300	<500	<200
Sri Lanka	4200	<100	<200	<500	<1,000	<100	<100
Thailand	440,000	19,000	14,000	12,000	6,900	<500	<100
Timor-Leste	<1000	NA	<100	NA	<100	NA	NA
South-East Asia	3,500,000	170,000	130,000	200,000	180,000	23,000	16,000

Source: UNAIDS AidsInfo [5], India HIV estimates 2015 [8], UNAIDS country progress reports for Bhutan and Timor-Leste [6,7], and WHO regional estimates 1990–2015[1].

NA – not available.

SWs in India, Sri Lanka and Thailand (Table 2). However, condom promotion programs for PWID are not getting strong results: India reports the highest rates for the region at 77% [5].

All but three countries (Bhutan, Sri Lanka and Timor-Leste) have opioid substitution therapy (OST) programmes for PWID [10]. Limited available data show that only 2% of PWID in Bangladesh, 15% in India, 12% in Myanmar and 35% in Indonesia were receiving OST in 2015 [11]. Six countries (Bangladesh, India, Indonesia, Myanmar, Nepal and Thailand) have needle and syringe exchange programmes for PWID [10] but only India, Bangladesh, and Myanmar have achieved the global standard of over 200 needles distributed per PWID per year in 2015 [5] (Table 2).

In 2015, the WHO issued guidelines that recommend antiretroviral pre-exposure prophylaxis (PrEP) as an additional prevention tool for people at substantial risk of HIV [12]. Thailand is the only country in the region that recommends PrEP for key populations (national treatment guidelines 2014) [13]. Implementation science research of PrEP is ongoing in India and Thailand [14].

HIV testing, care and treatment

HIV testing policies differ across countries. India, Maldives, Myanmar and Thailand recommend HIV testing for all populations nationwide while the others have prioritised testing in high-prevalence areas and/or for high-risk populations. HIV testing services are provided in a variety of facilities such as antenatal (ANC), ART, tuberculosis (TB), sexually transmitted infection and OST clinics [10]. Community-based testing is also provided in some countries to increase accessibility, especially for key populations.

In Thailand, 89% of the estimated number of PLHIV were aware of their HIV status in 2015, this is the only country from the region that is on track to achieve the first of the 90-90-90 targets of 90% of PLHIV diagnosed by 2020 [11] (Table 2). In other countries, the estimated number of PLHIV who have been diagnosed range from 26% in Indonesia to 71% in India (2015) [11]. Fewer PLHIV are aware of their HIV status in countries that prioritise testing geographically or for high-risk populations. Coverage of testing and counselling for key populations also remains low in many countries. The latest available surveillance data show that rates of HIV testing for SWs are highest in India

at 91%, followed by Timor-Leste at 66% (2013 data), but stand below 50% in other countries [5]. Testing rates vary from 8% in Sri Lanka to 64% in India for PWID and from 14% in Sri Lanka to 71% in India for MSM [5].

ART eligibility criteria also vary among countries [13]. Of the 10 member states two (Thailand and Maldives) recommend ART irrespective of CD4 cell count for all PLHIV, in line with the recently released 2015 WHO guidelines [12]. Six countries, excluding India and Indonesia, recommend initiation of ART at the 2013 WHO guideline [17] level of CD4 cell count <500 cells/mm³, and irrespective of CD4 counts for PLHIV co-infected with TB or hepatitis B, pregnant women and serodiscordant couples. India and Indonesia recommend treatment at 2010 WHO guideline [18] levels of CD4 cell count <350 cells/mm³ and irrespective of CD4 count for PLHIV co-infected with TB or hepatitis B and pregnant women. Indonesia has also prioritised serodiscordant couples, key populations and PLHIV in high-prevalence areas for ART irrespective of CD4 cell count. Seven countries recommend ART irrespective of CD4 cell count for children below 5 years of age [13]. India recommends ART irrespective of CD4 cell count for children below 2 years of age, while in Sri Lanka and Thailand, ART irrespective of CD4 count is recommended for children aged below 1 year [13]. Since 2010, all countries have updated their treatment guidelines periodically to keep pace with the latest evidence and follow WHO guidelines. As a result, ART scale up has been impressive in the region.

At the end of 2015 more than 1.4 million PLHIV were receiving ART compared to 670,000 in 2010 [1]. ART coverage among the estimated number of PLHIV has nearly doubled from 20% (17–23%) in 2010 to 39% (33–46%) in 2015 [1]. However, the region and its member states have a long way to go in order to achieve the second 90-90-90 [19] target of 81% of estimated PLHIV on ART by 2020. Thailand has the highest coverage of ART at 65% in 2015 (Table 2) compared to 44% in 2010 [5]. India, Myanmar and Nepal have also shown a significant increase in access to ART but only 43%, 47% and 27% of the estimated number of PLHIV were receiving ART, respectively (Table 2). Treatment coverage was extremely low in Indonesia at 9% in 2015 and has improved at a slow pace [5]. ART coverage among children

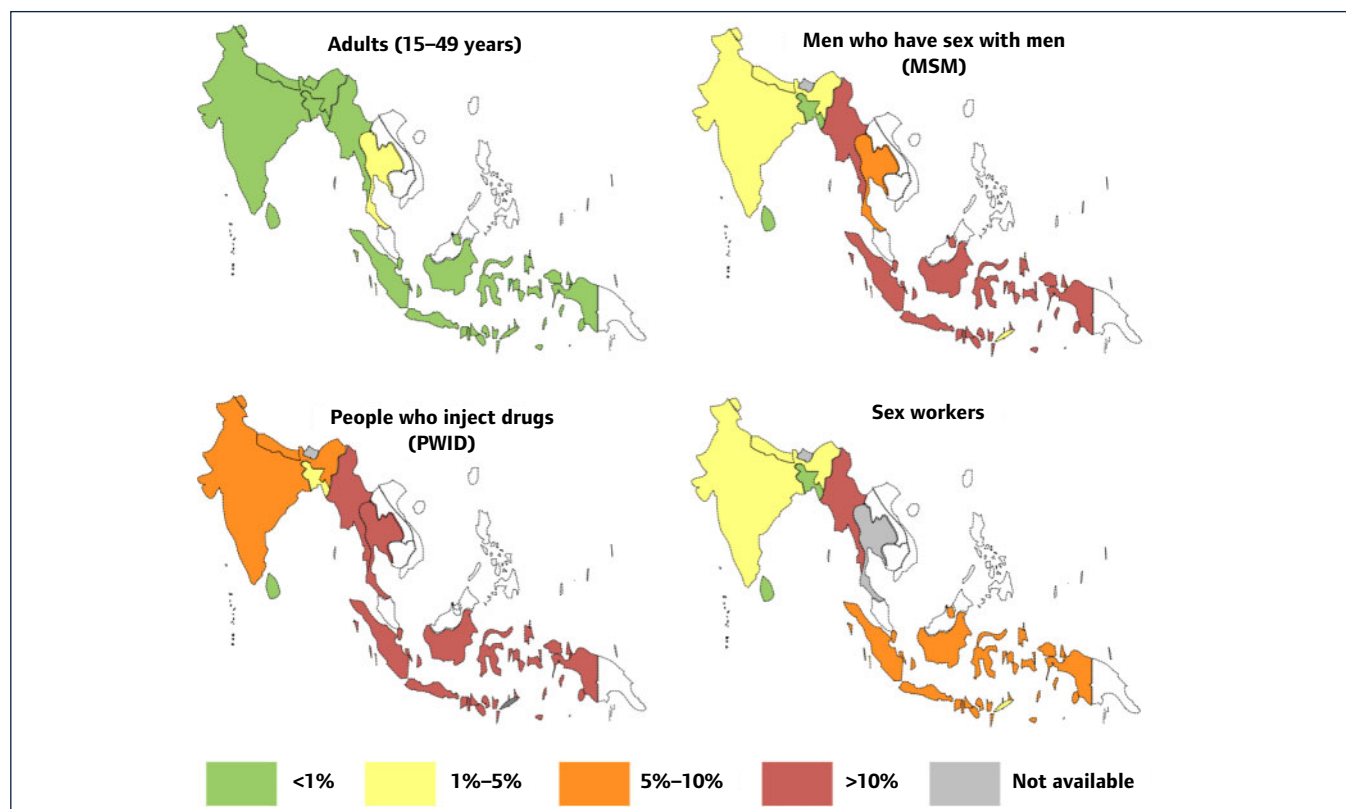


Figure 1. HIV prevalence among adults (15–49 years) and key populations in 10 member states. Sources: UNAIDS AidsInfo [5], India HIV estimates 2015 [8], and UNAIDS country progress reports for Bhutan, Maldives, Nepal and Timor-Leste [6,7,15,16]. Data are from 2015 except for Timor-Leste (for MSM and sex workers), Bangladesh (for PWID), and Nepal (for sex workers), which are from 2013

Table 2. Coverage of key interventions for prevention and treatment of HIV in 10 member states

Country	Condom use (%)			No. of needles per PWID (2015)	PLHIV aware of their HIV status (2015)(%)		ART coverage (2015)(%)			PLHIV on ART with viral suppression (2015)(%)
	MSM	PWID	Sex workers		All	Pregnant women	All	Children (0–14)	Pregnant women	
Bangladesh	46	35	67	243	36	NA	15	31	14	70
Bhutan	NA	54	NA	0	40*	NA	17*	NA	NA	NA
India	84	77	91	259	71	42	43	NA	38	NA
Indonesia	81	46	68	13	26	25	9	16	9	NA
Maldives	NA	NA	NA	0	NA	NA	NA	NA	NA	NA
Myanmar	77	23	81	223	NA	NA	47	75	77	87
Nepal	86	53	NA	25	57	35	31	58	35	90
Sri Lanka	47	26	93	0	54	24	19	46	24	NA
Thailand	82	47	95	6	89	100	65	>95	>95	96
Timor-Leste	66	NA	36	0	NA	19*	37*	NA	NA	NA

Source: UNAIDS AidsInfo [5], UNAIDS Global AIDS Progress Reporting 2014 and 2015 and WHO Regional Office for South-East Asia HIV/AIDS Fact Sheets (www.searo.who.int/entity/hiv/data/factsheets/en/).

MSM: men who have sex with men; PWID: people who inject drugs; PLHIV: people living with HIV; ART: antiretroviral therapy; NA: not available.

* Data for Bhutan and Timor-Leste are from 2014.

Note: Data on condom use are the latest available data 2010–2015.

aged 0–14 years show similar trends in the region, from 16% in Indonesia to over 95% in Thailand (Table 2). Limited data are available among key populations. Published studies from India show ART coverage of 16%, 18% and 21–49% among MSM, PWID and SWs, respectively [8,20–23]. Viral load (VL) testing is not widely available except in Thailand. Limited data from four countries show high viral suppression among PLHIV on ART (>85%) in three countries (Myanmar, Nepal and Thailand) compared to 70% in Bangladesh (Table 2).

Prevention of mother-to-child transmission of HIV (PMTCT)

Universal access to provider-initiated testing and counselling (PITC) for pregnant women in ANC is recommended in five countries (Bhutan, India, Maldives, Myanmar and Thailand) [10,24]. Of the number of pregnant women who attended an ANC or had a facility-based delivery in the past 12 months, 100% were tested for HIV in Thailand, 85% in Myanmar and 41% in India in 2015 [11]. Five countries (Bangladesh, Indonesia, Nepal, Sri Lanka and

Timor-Leste) have prioritised HIV testing in high prevalence areas and the 2015 HIV testing coverage among pregnant women who attended an ANC or had a facility-based delivery varied between 0.1% in Indonesia to 71% in Sri Lanka [11]. Data from 2015 also show that >55% of the estimated HIV-positive pregnant women are unaware of their HIV status in all countries except Thailand, leading to poor outcomes along the PMTCT cascade [11] (Table 2).

Option B+ for pregnant women, wherein all HIV-positive pregnant women are eligible for life-long ART, irrespective of their CD4 cell count, is recommended by all countries. It is either being implemented nationwide (e.g. India and Thailand) or being phased-in, starting with high-prevalence areas (e.g. Bangladesh, Myanmar, Nepal and Timor-Leste) [10]. It is at varying stages of implementation across the region. ART coverage among estimated HIV-positive pregnant women in 2015 was >95% in Thailand (vs 94% in 2010) and 77% in Myanmar (vs 39% in 2010)[5]. PMTCT ART coverage remains low in other countries and has shown some improvement only in Nepal. Indonesia lags far behind, at <10% in 2015 [5].

Thailand leads the region in PMTCT. In June 2016 the country had successfully reduced transmission rates to <2%, becoming the first country in Asia to eliminate mother-to-child transmission of HIV and syphilis [25].

HIV spending

HIV spending data are available from only six countries in the region. Thailand has the highest among the member states and in 2013 spent US\$287 million on their HIV response, up from US\$236 million in 2010 (22% increase) [5]. Spending in Myanmar and Indonesia has also increased by 29% (2010–2013) and 26% (2010–2012), respectively, but total HIV spending has decreased in India and Sri Lanka [5].

In Thailand, 89% of the total HIV spending in 2013 was funded from domestic resources [5]. In two countries, Bangladesh and Myanmar, <15% of the HIV response is financed domestically [5]. Indonesia and Sri Lanka are financing 42% and 55% of their HIV response from domestic resources, respectively [5]. Compared to 2010, domestic spending as a proportion of total HIV spending has increased in all countries (Bangladesh, Indonesia, Myanmar, Sri Lanka and Thailand), but more domestic funds need to be committed to HIV in most of these countries.

Impact on AIDS-related deaths and new HIV infections

The number of estimated AIDS-related deaths has been declining in the region since peaking at 210,000 in 2005 [1]. There were 130,000 (110,000–150,000) in 2015 compared to 170,000 in 2010 (24% decline) [1]. Of the five high-burden countries, AIDS-related deaths have shown a declining trend in four. During the period 2010–2015, they have decreased by 43% in India, 39% in Myanmar, 12% in Nepal and 26% in Thailand [5]. In Indonesia, they have increased rapidly from 18,000 in 2010 to 35,000 in 2015 [5]. There were <1000 deaths in Bangladesh, Sri Lanka and Timor-Leste in 2015 [5,7].

Estimated new HIV infections in the region (total and among children aged 0–14) have declined slightly over the period 2010–2015. There were 180,000 (150,000–210,000) new HIV infections in 2015 compared to 200,000 (170,000–230,000) in 2010 (10% decline). There were 16,000 (13,000–19,000) new HIV infections in children in 2015 compared to 23,000 (18,000–26,000) in 2010, a 30% decline [1]. India, Myanmar, Nepal and Thailand

have experienced a 14%, 20%, 43% and 43% reduction between 2010 and 2015, respectively[5]. However, there was an increase, including in children, in Indonesia during the same period [5]. There were <1000 new infections in Sri Lanka and Timor-Leste in 2015 [5,7].

Discussion

Since 2010, the WHO South-East Asia region has made progress to combat the HIV/AIDS epidemic. Access to HIV services along the HIV continuum of care has expanded and, overall, the epidemic in the region has stabilised. HIV prevalence in the region and in most of the high-burden countries remains low and constant. New HIV infections and AIDS-related deaths are also showing a declining trend in many countries.

Despite this progress, coverage for prevention, testing and treatment services generally falls substantially short of UNAIDS Fast Track 90–90–90 targets. Less than 65% of PLHIV know their status, only 39% (33–46%) are on ART and VL monitoring is not widely available [1,11]. Access to HIV prevention, testing and treatment for key populations, particularly PWID and MSM, remains insufficient. Other hard-to-reach populations such as prisoners, migrants, children and adolescents are also underserved by the current HIV response. There are wide inter-regional and intra-regional disparities. Therefore a substantial shift in efforts is required to reach the ambitious Fast Track targets for 2020.

In a region largely characterised by concentrated HIV epidemics, it is vital to target the HIV response towards the most affected populations and locations. Countries have prioritised key populations for regular HIV testing and earlier treatment. Community-based organisations and civil society have also spearheaded critical structural changes and HIV prevention programmes, reducing HIV vulnerability of key populations and improving outreach [26–28]. However, these populations still have limited access to HIV-related services and there are difficulties in retaining them in care. There are multiple barriers to a successful HIV response for key populations – stigma and discrimination, lack of knowledge and awareness of positive status, and criminalisation of sex work, homosexuality and drug use [20,29–32]. Stigma reduction as an integral part of HIV prevention programming, community-based and community-led interventions, harm reduction for PWID and legal reforms are urgently needed in the member states. Furthermore, community-based organisations have to be systematically involved in the design, implementation and monitoring of programmes. Strong community–community [33] and government–community partnerships are needed, where governments must play an active role in providing financial and technical support to these organisations.

Expansion of HIV-testing services, especially for key populations, pregnant women, adolescents and HIV-exposed infants, is the key for achieving the fast track goals. Despite the efforts to decentralise testing services and expand community-based testing, coverage remains low. Stigma, discrimination, punitive laws and a lack of awareness remain key barriers to accessing testing [31,34,35]. The rate of institutional deliveries is low; virological testing for infants is not widely available [36] and adolescents do not know where to access HIV-testing services. Community-based and community-led models of service delivery (e.g. campaigns and home-based care) [37], HIV self-testing [38] and use of trained lay providers to conduct HIV testing need to be explored for the region. Countries also need to look at innovative strategies to create demand for HIV testing such as crowdsourcing, social media, peer-driven intervention, and incentive-based approaches for referring clients [28,39]. Additionally, expansion of laboratory capacities for early infant diagnosis and HIV testing in other

settings/programmes is needed. HIV testing algorithms should be further simplified and streamlined to address losses at the first step of the HIV continuum of care [40].

Based on the results from the HPTN 052 [41], INSIGHT-START [42] and TEMPRANO trials [43], the WHO updated its treatment guidelines in 2015 to recommend immediate ART initiation [12]. While two countries in the region have taken up this recommendation, the majority of them recommend treatment initiation according to the WHO 2013 guidelines [17]. The implementation of national guidelines has been slow in the region and ART coverage remains low. Substantial challenges are related to limited financial resources, drug procurement and supply, cost of HIV care, human resource constraints and low HIV-testing rates [44–46]. Similarly, despite clear guidance, the scaling up of routine VL monitoring is lagging behind due to high costs, poor infrastructure and lack of training [47]. Achieving the 90–90–90 targets will require countries to move to treatment for all, and to provide routine treatment monitoring. Strong political commitment, financial resources and programme efficiency are needed to address the current challenges.

HIV programmes in all but a few countries remain heavily dependent on international funding, which is shrinking, unpredictable and risky. Furthermore, economic growth in a number of countries has resulted in the fact that they are no longer eligible for support from the Global Fund. Combined with a slow increase in domestic HIV spending and a further need of funding to achieve the 90–90–90 targets, there are serious concerns regarding transition management, financing mechanisms and sustainability of HIV programmes [48]. Governments need to look at innovative and sustainable funding mechanisms to increase domestic HIV spending and decrease their reliance on donors. There is also room for greater efficiency as countries will need to allocate their resources in policies and practices that will maximise cost-effectiveness.

In conclusion, the South-East Asia region has come a long way in its HIV response but there remain major gaps. Much needs to be done in order to strengthen and sustain this response in the context of universal health coverage in the post-2015 era of SDGs. Ending the HIV epidemic in the region will require that governments work in close collaboration with communities and key stakeholders and efficiently use their scarce resources to provide evidence-based HIV prevention and treatment interventions for populations in locations that need them most.

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Disclaimer

The opinions and statements in this article are those of the authors and do not represent the official policy, endorsement or views of the WHO.

Conflicts of interest

None of the authors have conflicts of interest to declare.

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The impact of Thailand's public health response to the HIV epidemic 1984–2015: understanding the ingredients of success

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Abstract

Introduction: Thailand has been heralded as a global leader in HIV prevention and treatment, and its experience with the HIV/AIDS epidemic holds valuable lessons for public health. This paper documents Thailand's response to its HIV epidemic from the late 1980s until today, and analyses its epidemiological impact (incidence and mortality). We discuss the association between the trajectory of HIV incidence and mortality rates over time, and the programmatic investments, policies and interventions that were implemented in the last three decades.

Methods: This is a review paper that draws on published literature, unpublished sources and routine behavioural and serological surveillance data since 1989. It is informed by the modelling of epidemiological impacts using the AIDS Epidemic Model. The AIDS Epidemic Model and Spectrum were used to assess the impact on incidence and mortality. Apart from epidemiological data, National AIDS Spending Assessment and programme data were also used to assess financial investments.

Results: Thailand is well on its way to meeting the 90–90–90 targets, the goal that by 2020, 90% of people living with HIV know their HIV status, 90% of people with diagnosed HIV infection receive sustained antiretroviral therapy, and 90% of people receiving antiretroviral therapy (ART) are virally suppressed. In Thailand, 89% of people living with HIV know their status, 72% receive ART and 82% have viral load testing – 99% of whom are suppressed. The public health response to HIV in Thailand has averted 5.7 million infections since 1991. If Thailand had not responded in 1991 to the HIV epidemic, and had there been no prevention and ART provision, the country would have experienced an estimated 158,000–225,000 deaths in the 2001–2006 period. This figure would have risen to 231,000–268,924 in the 2007–2014 period. A total of 196,000 deaths were averted between 2001 and 2014. If ART scale-up had not occurred in 2001, Thailand would have experienced between 50,000 and 55,000 deaths per year in the period 2001–2006, and 31,000–46,000 annual deaths between 2007 and 2014. The main impact in terms of deaths averted is seen from 2004 onwards, reflecting treatment scale up.

Conclusions: Thailand's AIDS response has prevented needless morbidity and mortality due to the HIV epidemic. In the context of Thailand's ageing population, it is faced with the twin challenges of maintaining life-long quality services among HIV patients and sustaining behaviour change to maintain primary prevention gains. Keeping the focus of the policy makers and health administrators on 'Ending the HIV epidemic' will require consistent advocacy, and evidence-based, innovative and efficient approaches.

Keywords: HIV/AIDS, Thailand, incidence, impact, interventions, ART, universal health, health governance

Introduction

Thailand's first case of HIV was reported in 1984. The epidemic has evolved and changed strikingly over the last three decades. The early phase of the epidemic was mostly that of HIV-1, subtype B, which rapidly escalated among people who inject drugs (PWID) in 1988 [1,2]. The virus then quickly spread to populations of female sex workers (FSWs), with increasing documentation of subtype E [3]. The epidemic spread rapidly in the early 1990s, driven by infections among sex workers and their clients [4–6]. The prevalence among direct FSWs was much higher, peaking in the mid-1990s, and declining rapidly after that (Figure 1a). There were clear geographical differences in the prevalence of HIV. The upper-northern provinces accounted for a disproportionate number of HIV case reports [7]. By 1993, some 600,000–800,000 people were estimated to be living with HIV [11]. At the same time, the prevalence of HIV in the general population – as measured by women attending antenatal clinics, newly recruited male conscripts as well as blood donors – also showed an increase, peaking in the early 1990s, and then declining slowly (Figure 1b).

Data based on AIDS case surveillance between 1984 and 1998 showed that the most frequently reported opportunistic infections were tuberculosis (19%), *Pneumocystis carinii* pneumonia (19%), cryptococcosis (17%), candidiasis of oesophagus, trachea or lung (5%) and recurrent bacterial pneumonia (4%) [2]. Cross-sectional survey data of hospital admissions between 1993 and 1996 also indicated that the most common AIDS-defining conditions were cryptococcosis, tuberculosis and HIV-wasting syndrome; PWID were more likely to have tuberculosis or suffer from HIV-wasting syndrome [8].

As HIV prevalence began to decline among FSWs and their clients in the mid-1990s, data from serial prospective cohorts among young Thai military conscripts also showed simultaneous declines in the incidence of both HIV and sexually transmitted infections, suggesting successful interventions and changes in transmission patterns [7]. The early 2000s saw marked changes in the transmission routes in Thailand, with sharp increases in the estimated HIV incidence among young men who have sex with men (MSM) – from 4.1% to 7.7% between 2003 and 2007 [9], with a median of 9.2% as a national estimate in 2014. Prevalence among MSM in Thailand has remained high (Integrated Biological Behavioral Surveillance Round, 2014). HIV incidence among MSM is especially high among those living in large urban areas and international tourist destinations for example, Bangkok, Chiang

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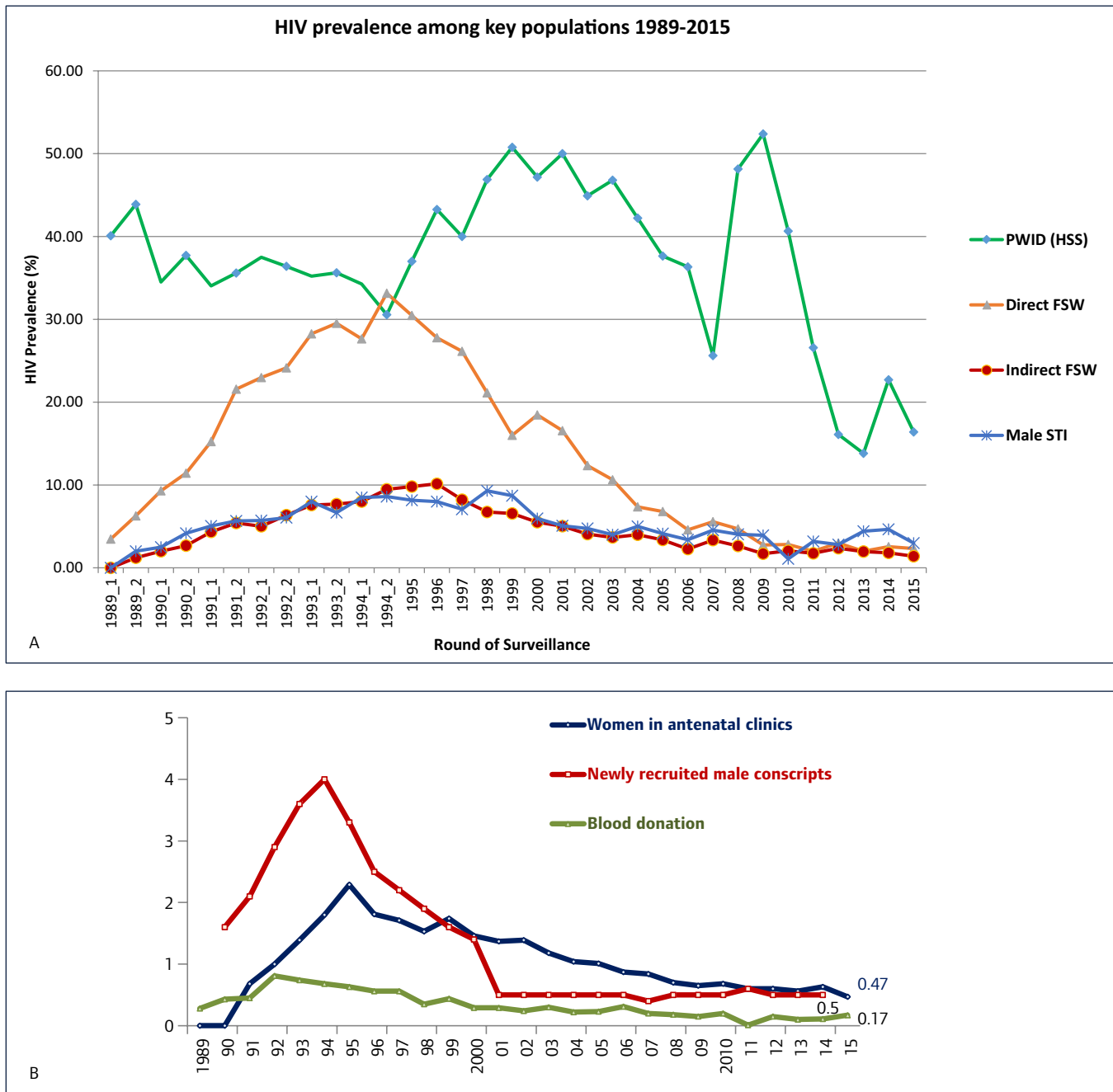


Figure 1. (A) HIV prevalence among key populations from 1989 to 2015. The decline in the prevalence of HIV among PWID is probably linked to sampling issues. The sample size for PWID was inadequate and limited to fewer than 10 sites after 2009. Source: Bureau of Epidemiology, Ministry of Public Health Thailand, Sentinel Surveillance Survey data 1989–2013. (B) HIV prevalence in the general population in Thailand, 1989–2015. Source: Bureau of Epidemiology, Thai Ministry of Public Health, Sentinel Surveillance Survey data 1989–2015

Mai, Phuket and Pattaya. In a large clinic-based study of MSM coming forward for testing at the Silom Community Clinic in Bangkok, an incidence of 12.2 per 100 person years was found among 15–21 year old men, this is almost twice as high as among all ages, which was 6.3 per 100 person years [10].

The HIV epidemic up to 2015 is mature and abating rapidly. According to the AIDS Epidemic Model, Global AIDS Report for Thailand 2015, in 2014 there were an estimated 445,504 people living with HIV in Thailand, including 175,716 women and 6875 children. The estimated HIV prevalence among adults was 0.83%. There were an estimated 7816 new infections in 2014, including 121 in newborns. A quarter of adult infections (1944) occurred in women, of them 221 in FSW, and the remaining 1723 in other groups of women, particularly discordant couples and partners of members of key populations.

The transmission of HIV from parents to children has been successfully controlled. According to programme data from the Department of Health, the parent-to-child transmission (PTCT) rate was 1.9% in 2015. AIDS-related deaths have been steadily falling since 2001, with a sharp drop observed from 2006 following the scaling up of ART. The National AIDS Management Centre estimates that there were 20,492 deaths among people living with HIV/AIDS in Thailand in 2014 (modelling estimates from the AIDS Epidemic Model). However, programme data from the National Health Security Office, based on an analysis of records from the Ministry of Interior’s Civil Vital Registration System, suggests that there may be fewer than 16,000 AIDS-related deaths.

Thailand has been heralded as a global leader in HIV prevention and treatment, and its experience with the AIDS epidemic holds valuable lessons for public health. This paper documents Thailand’s

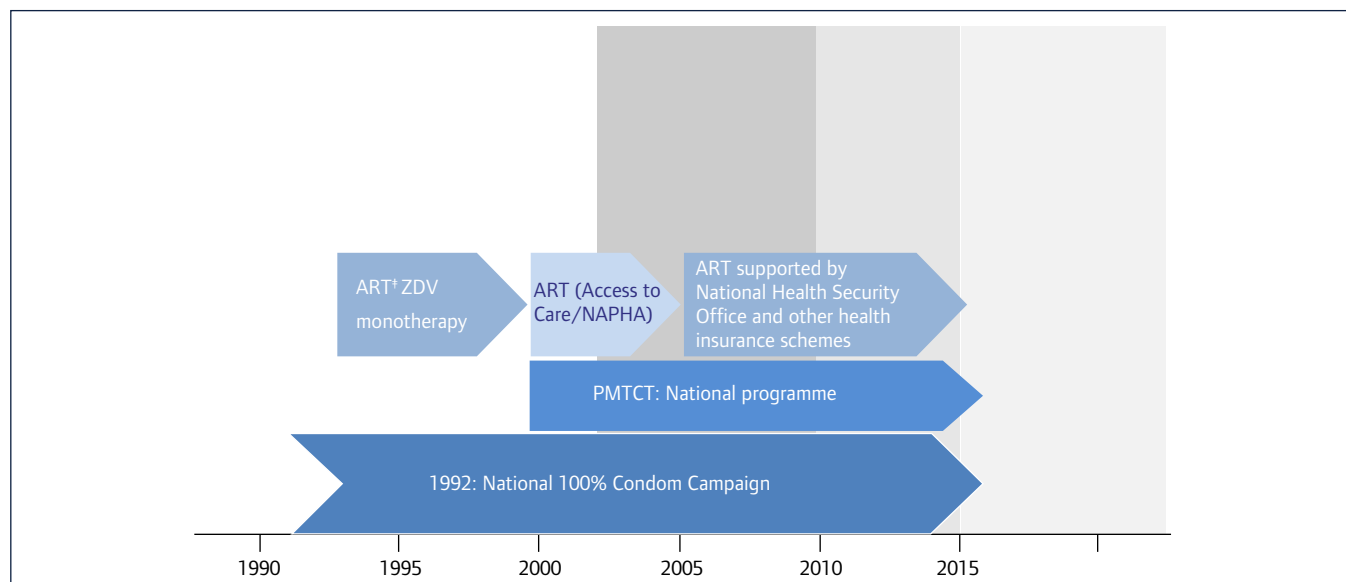


Figure 2. Timeline of HIV interventions and investments in Thailand, 1990–2015. Prevention of mother-to-child transmission (PMTCT), National access for people living with HIV/AIDS (NAPHA) to ART, which was a highly active antiretroviral treatment (HAART) regimen funded by the Thai government and the Global Fund between 2002 and 2005. The ART programme started in 1992 with ZDV monotherapy and later continuing with dual therapy

response to its HIV epidemic from the late 1980s until today, and analyses its scope and epidemiological impact (incidence and mortality). We discuss the association between the trajectory of HIV incidence and mortality rates over time, and the programmatic investments, policies and interventions that were implemented in the last three decades. In doing so, we document and describe not just the public health interventions, but also consider issues of governance, universal health coverage as well as structural and policy constraints that influence public health outcomes.

Methods

This review draws on published literature and unpublished sources and routine behavioural and serological surveillance data since 1989. It is informed by the modelling of epidemiological impacts using the AIDS Epidemic Model (AEM). Electronic data sources include Medline, PubMed, the Social Sciences Citation Index, Social Sciences Index and Abstracts, and the International Bibliography of the Social Sciences. Key peer-reviewed journals published between 1984 and 2015 were searched. Serological and behavioural data collected by the Bureau of Epidemiology (BOE), covering the period since the establishment of the HIV sero-surveillance system (1989) and the behaviour sentinel surveillance programme (1995) were also reviewed. These data provide information on key affected populations (KAPs) and the general population. Finally, AEM models to assess impact on incidence and mortality in conjunction with vital registration data were also analysed.

Apart from epidemiological data, we used information from National AIDS Spending Assessment (NASA) and programme data from the Ministry of Public Health (MOPH) and National Health Security Office (NHSO) to assess financial investment and track monetary flows to specific interventions.

Results

We distinguish our findings over two phases. First, we present the outcomes and impact of Thailand's early prevention interventions (1990–2000). Second, we present and discuss the impact of the country's prevention of mother-to-child transmission (PMTCT) programme, the scaling up of treatment with antiretroviral drugs (2000–2015; Figure 2).

Phase 1

The public health responses started within the Division of Venereal Diseases under the Communicable Disease Control Department and the Division of Epidemiology of the Office of Permanent Secretary Office after the first AIDS case report from a tertiary hospital in Bangkok in 1984. This led to HIV being classified as a reportable disease and the development of the surveillance system, which resulted in the case-based reporting system in 1984. The National AIDS Programme was launched in 1987 with the establishment of the Center of AIDS Prevention and Control, which subsequently became the Division of AIDS under the Department of Communicable Disease Control of the Ministry of Public Health. By 1989, a surveillance system had been established across Thailand and an accurate assessment of high-risk groups and behavioural patterns provided strategic information for evaluations and resource allocation [2]. By 1992, the HIV/AIDS programme was being co-managed by the Ministry of Public Health and the Office of the Prime Minister – controlling the epidemic had become a priority national agenda.

Concomitantly, the Thai Government stepped up its investment in HIV control, from just US\$180,000 in 1988, to US\$44.33 million in 1993. By 1996, the government allocated US\$81.96 million to its response to control the spread of HIV [11].

A remarkable aspect of the Thai national response to HIV has been the government's strong financial ownership of the programme, even when Thailand was classified as a 'lower-middle income' country. With the exception of 1989, Thai domestic resources have accounted for the vast majority of funding for the AIDS response. In addition, the early prevention efforts and treatment scale-up were funded through the national budget (Figure 3). Despite the financial collapse during the Asian financial crisis in the late 1990s, Thailand sustained a lowered, but substantial investment in the AIDS response. This financial commitment reflects the Thai government's strong commitment to control HIV. Funding from the Global Fund for HIV, TB and Malaria (GFATM) first became available in 2003, and has accounted for between 10 and 15% of the money spent in Thailand's response since then, with most funds being used for treatment and prevention in young people in the first 5 years and later on a focus in prevention among KAPs (Figure 3).

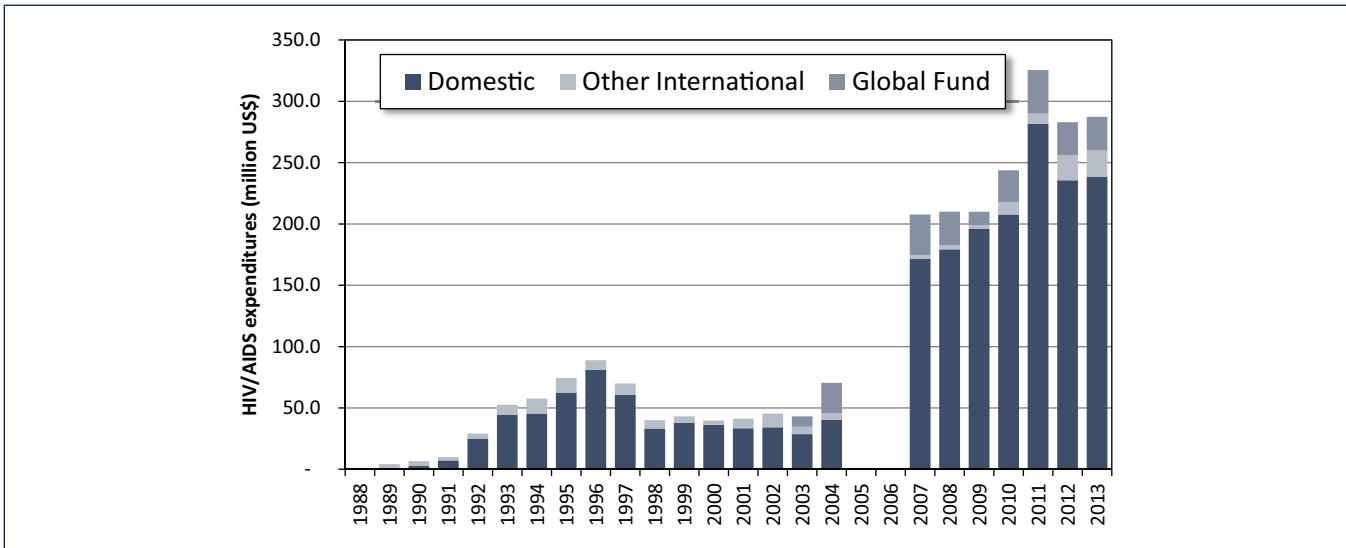


Figure 3. Thailand’s national HIV/AIDS expenditures by source of funding, 1988–2013. Source: National AIDS Spending Assessment conducted from 2007 to 2013, reported to UNAIDS, National AIDS Account data 1988–2004

By the end of 1991, Thailand’s well-documented 100% Condom Use Programme had been initiated following the Ratcharaburi model [12–14]. Condom use increased dramatically in sex-work settings from 14% to 94% between 1989 and 1993 [15]. A 79% decrease in sexually transmitted infection (STIs) rates among men was attributed to the 100% Condom Use Programme [16]. Other studies among male conscripts during the period 1991–1993 ($n=4086$) also showed that HIV incidence declined from 2.48 per 100 person years between 1991 and 1993 to 0.55 between 1993 and 1995 [17]. STI rates in the 1991 cohort declined even more sharply: from 17 per 100 person years to 1.8 per 100 person years in the 1993 cohort [17].

The AEM shows that the impact of early prevention in Thailand averted 2,170,000 infections (Figure 4). The annual number of new infections fell dramatically after 1992, from 168,485 in 1991 to 28,241 in 2000 (Thai Working Group on HIV Estimation and Projection, 2015). Modelling using the AEM suggests that by 2013,

the total number of averted infections since 1991 had risen to 5.7 million (Thai Working group on HIV Estimation and Projection 2015). If Thailand had not responded in 1991 to the HIV epidemic, and had there been no prevention and ART provision, the country would have experienced an estimated 158,000–225,000 deaths in the period 2001–2006. This figure would have risen to 231,000–268,924 in the period 2007–2014 (Thai Working Group on HIV Estimation and Projection, 2015).

Phase 2

In 2000, Thailand initiated its nationwide PMTCT programme [18]. It provided voluntary and free testing for all pregnant women, provision of free ART to pregnant women and newborn infants, and free formula feeding for infants for the first 12 months [19]. The effectiveness of Thailand’s PMTCT programme has been rigorously assessed [20,21]. In the period 2001–2003, the transmission risk among those completing a short course of

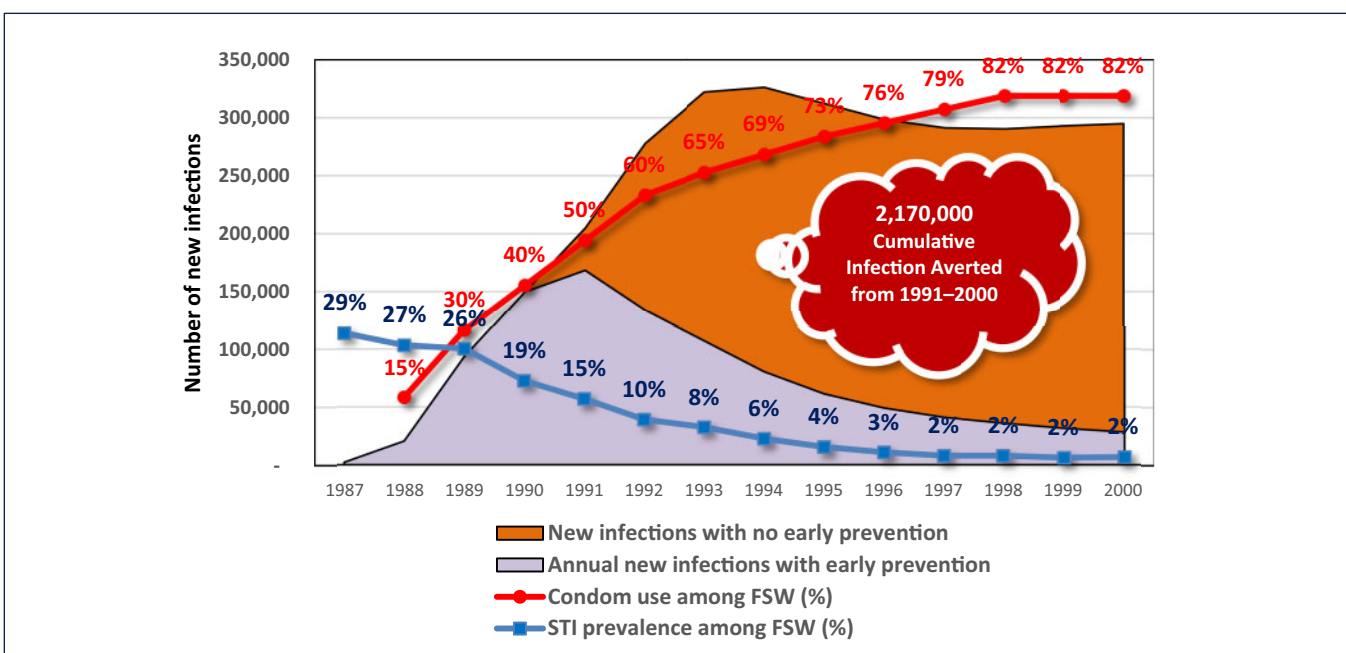


Figure 4. Impact of early prevention on new infections in Thailand (1991–2000), and the potential costs of inaction. FSW: female sex worker; STI: sexually transmitted infection. Source: Thai Working Group on HIV estimation and projection, 2015

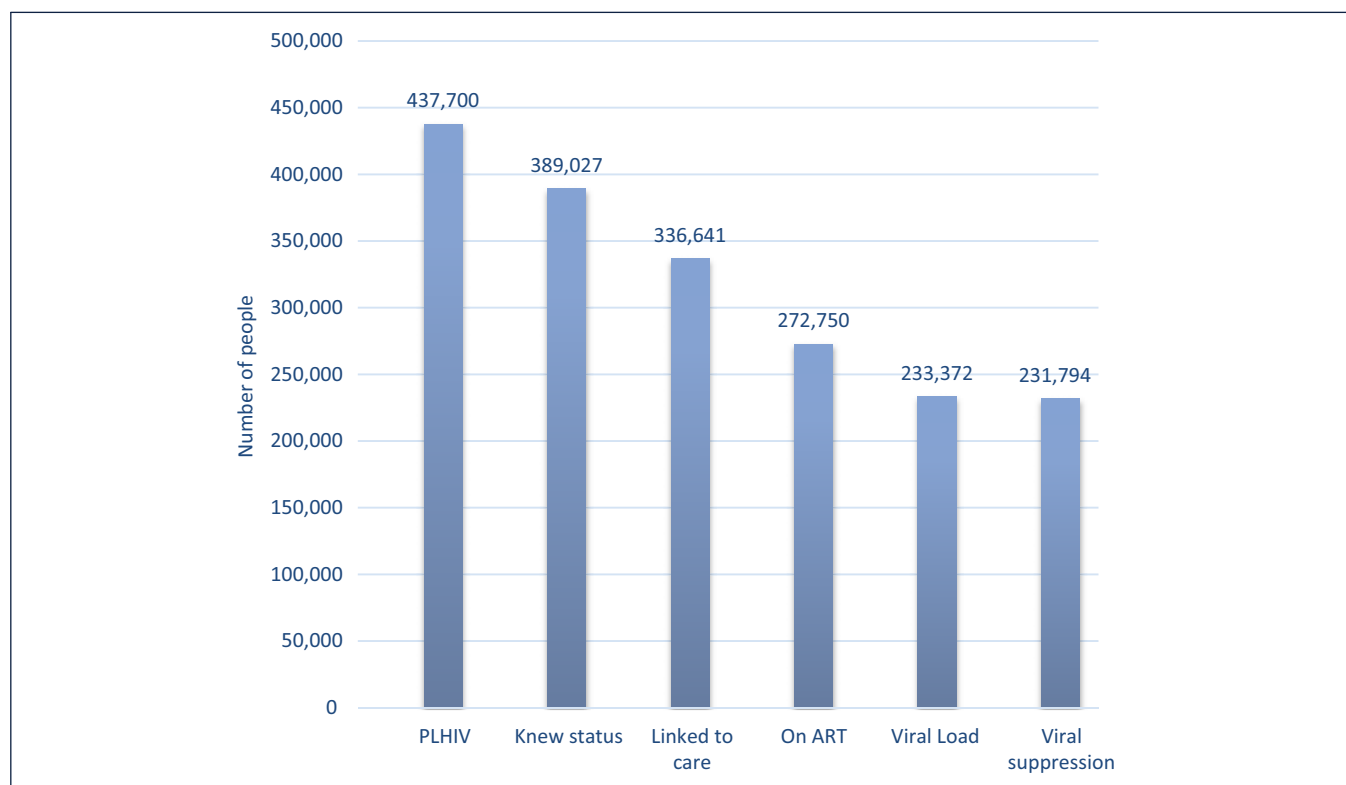


Figure 5. Testing and treatment cascade, Thailand 2015. This data excludes tests and treatment in the private sector. An estimated additional 15,481 people are on ART in the private sector, which is not routinely reported, bringing the total number on ART to 288,231 (estimates based on data from the Government Pharmaceutical Organisation). Source: National AIDS Programme Database, National Health Security Office, 2015

zidovudine (ZDV)-only regimen declined from 18.9–24.2% to 6.8% (CI 5.2–8.9%). Among those who received ZDV along with nevirapine (NVP), the transmission was 3.9% (CI 2.2–6.6%) [19]. By 2005, 89.8% of HIV-positive pregnant women were receiving ART to reduce MTCT. By 2009, this share had risen to 94.7% [22]. In 2010, a triple ART regimen began to be used for PMTCT, when the Thailand National Health Security Office, supported by cost-benefit analysis data, advised the use of HAART over ZDV + single-dose-NVP in HIV-positive women [23,24]. In 2015, 95.8% of Thai and non-Thai HIV-positive pregnant women received drugs to reduce MTCT. Some 76% of infants born to HIV-positive mothers received virological testing within two months of birth, and only 2.1% of infants born to HIV-positive mothers were infected [25,26]. Unpublished estimates using Spectrum by the National AIDS Management Centre indicate that between 2000 and 2014, the PMTCT programme prevented a total of 15,760 infants from being infected and 7440 deaths. In 2016 Thailand was officially certified by the World Health Organization as having eliminated mother-to-child transmission of HIV and congenital syphilis.

HIV treatment with antiretroviral drugs was first started in 1992 with ZDV monotherapy, and later, dual therapy. At the end of 1995, approximately 4200 people were being treated [27]. In 2000 the concept of providing ART free of charge took concrete shape under the Access to Care (ATC) programme, drawing on the principles of equal access to HAART and quality of services for all. In 2002, two critical events facilitated the massive scale-up of ART in Thailand. First, the Government Pharmaceutical Organisation (GPO) began producing GPO-VIR (a fixed-dose generic combination of stavudine, lamivudine and NVP). Second, more funding was made available: the government doubled the budget for ART due to the exclusion of ART from universal health coverage and in 2004 Thailand received supplemental support from Round 1 of the GFATM for the ART programme.

The ATC programme was renamed the National Access to Antiretrovirals Programme for People living with HIV/AIDS (NAPHA), and massively scaled up ART – treating 58,133 PLHIV, with a total budget of ฿800 million (approximately US\$23 million) [27]. The roll-out of ARVs was made a priority not just for adults, but also for children, with 7543 children put on ART between 2000 and 2007 [28]. An assessment of treatment outcomes for ART among adults in Thailand (2000–2007) showed that outcomes remained good, with much improved survival rates, despite the rapid scale-up of ART [29]. By 2010, more than 150,000 patients were receiving ART [30] with doctors using a treatment initiation criterion of CD4 cell count <350cells/mm³ [30]. In 2014, based on new evidence, new guidance recommended ART initiation irrespective of an individual's CD4 cell count [31].

At the end of 2015, Thailand was well on its way to reach the 90-90-90 targets. Of the 437,700 estimated PLHIV in 2015, 389,027 (89%) had been diagnosed with the virus (these figures exclude HIV tests in the private sector), and 336,641 were in care (National AIDS Programme Database, National Health Security Office, 2015). Of those in care, 288,231 were on ART and 231,794 were virally suppressed (NAP Database 2015). The main areas of loss from the care cascade (defined by more than a 10% difference between any two points in the cascade) were between those in HIV care and those commencing ART, and those on ART and those who were virally suppressed (see Figure 5).

The impact of the large-scale provision of ART in Thailand between 2001 and 2014 was assessed using the AEM. A total of 196,000 deaths were averted between 2001 and 2014 (Figure 6). If ART scale-up had not occurred in 2001, Thailand would have experienced between 50,000 and 55,000 deaths per year in the period 2001–2006, and between 31,000 and 46,000 annual deaths in the period 2007–2014 (Thai Working Group on HIV Estimation and Projection, 2015). The vast majority of the impact in terms

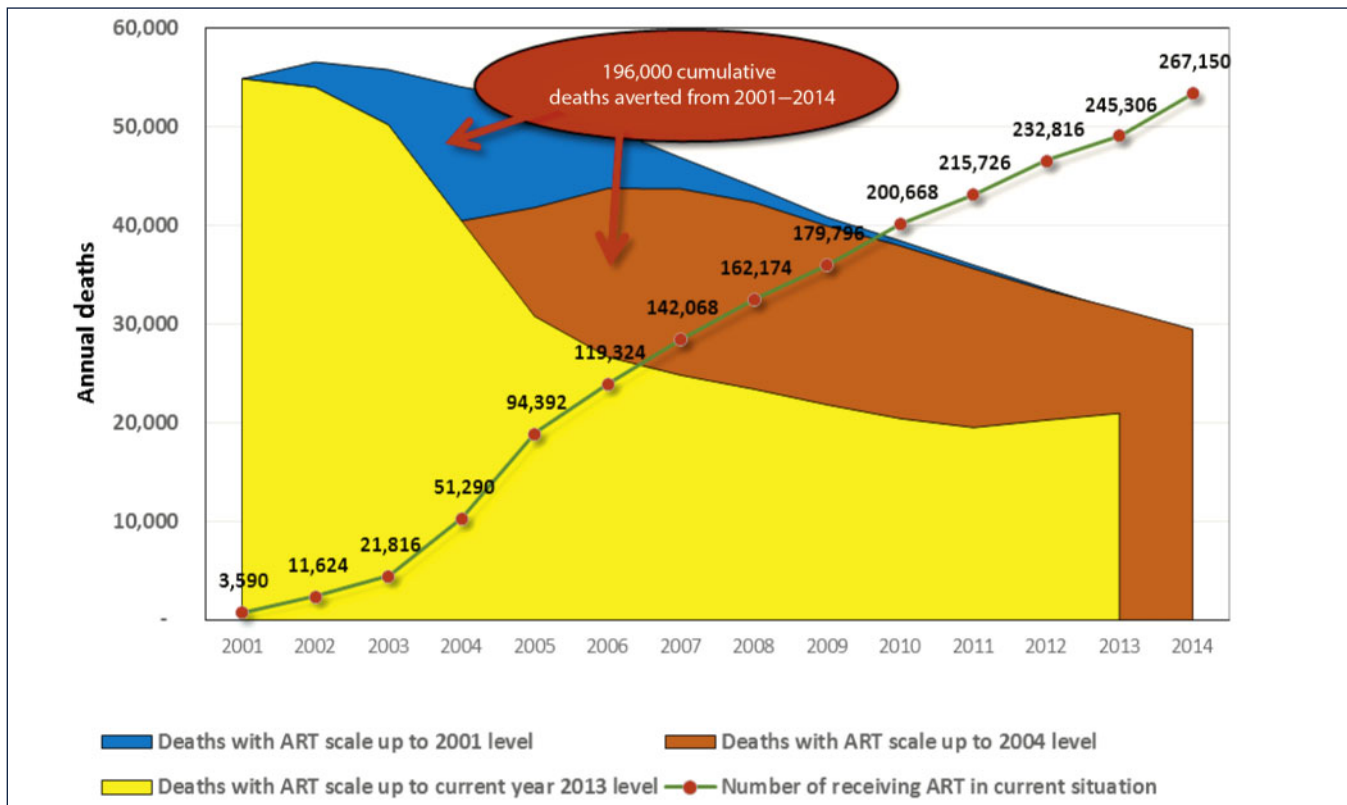


Figure 6. The impact of ART scale up on deaths due to AIDS in Thailand, 2001–2014. Source: Thai Working Group on HIV estimation and projection, 2015

of deaths averted is seen from 2004 onwards, reflecting treatment scale up (Figure 6).

The impact of the response to HIV in Thailand is also reflected in the burden of disease analysis. In 2004, HIV was the top cause of death in men (26,400 deaths), and the second most common cause in women (11,000 deaths) [32]. However, between 1999 and 2004, the burden of death and disease attributable to HIV/AIDS fell from 32.3 to 21.1 disability-adjusted life years per 1000 men, and to a lesser extent in women (from 12.2 to 9.3) [32]. In 2015, HIV/AIDS was the sixth most common cause of death surpassed only by coronary heart disease, stroke, road traffic accidents and other causes [33].

Discussion

This paper takes stock of the HIV/AIDS response in Thailand, and looks at more than 30 years of prevention, care and treatment efforts in the country. We have reviewed and synthesised published evidence, programme data and the results of modelling exercises to gauge the impact that these efforts have had. We argue that while the evidence and our analysis does not allow us to attribute direct causality, there are strong temporal associations between these efforts and the impact on HIV incidence and AIDS-related mortality. We have assessed the impact of the programme specifically in terms of declines in incidence and mortality. It is important, however, to acknowledge that some key governance, financial and policy inputs into the national AIDS control efforts have strongly influenced those outcomes. The role of Thailand's well-developed health infrastructure, the government's strong political commitment and the stewardship from the Prime Minister's office have been well described elsewhere [11]. We highlight three key issues that have been critical in ensuring that interventions in Thailand could be implemented early, at scale and in a sustained fashion: health governance, reform and partnership with civil society.

Health governance and reform

Thailand has gone through a major reform of governance and its health service system with the Decentralization Act in November 1999 and the introduction of universal health coverage in 2002. Government reform involved the devolution of authority for some operations from the central government to the provincial and local administrations. There were changes to the structure of the Ministry of Public Health, and in the management of the AIDS budget as part of this decentralisation. Following enactment of the official ministerial proclamation in 2002, the Ministry of Public Health implemented structural reforms at central and regional levels. In particular, at the central level, the role of the National AIDS Committee shifted from policy and budget support for implementation and development to co-ordination, monitoring and technical support. A portion of the prevention budget and much of the task of implementation was decentralised to local administrative organisations. Other related line ministries made budget requests for HIV prevention activities through their own agencies. Apart from antiretroviral treatment, which has been centrally managed, the budget for HIV clinical services for opportunistic infections was integrated into the national health insurance scheme, and allocated to health service outlets in the form of per capita lump sum payments [34].

The national AIDS response is integrated into numerous and diverse programmes of participating agencies and line ministries. Up until 2005, these ministries prepared AIDS budgets in collaboration with the Ministry of Public Health. However, starting in 2005, no specific AIDS budget was defined. It became the responsibility of each ministry to allocate a budget line for HIV control. The budget for health of the population was allocated as a lump sum based on per capita needs, including AIDS. This approach promoted a multi-sectoral response and removed the constraints of a centralised budget. For example, under the arrangement, local administrative organisations were made responsible for paying a

monthly allowance to PLHIV. Provinces were also expected to prioritise and budget for health issues at the local level. This made financing directly available at the local level (rather than indirectly through a centralised funding mechanism). While this decentralisation has led to some positive changes, the risk that there may be varying capacities and awareness across provinces regarding continued investment and engagement with HIV has remained a challenge [35].

With the ultimate goal of equal rights to the access of quality health services for all – as stipulated under Section 52 of the 1997 Constitution – the government also implemented the Universal Health Security Scheme namely the ‘30 Baht scheme’ (in addition to the Social Security Scheme and the Civil Servant Medical Benefit Scheme). This package entitled all Thai citizens to free medical services and health promotion and prevention. At the introduction of the scheme, antiretroviral treatment was excluded from the service package, but included in 2006. The National Health Security Office-supported ART programme is highly cost effective at less than US\$1 per day per patient, and was supported by the government’s bold policies in initiating generic production, cost negotiation and compulsory licensing of ARV drugs, specifically for efavirenz and lopinavir/ritonavir [36,37].

Partnership

The Ministry of Public Health had begun to engage with civil society partners in Thailand on the issue of HIV prevention and treatment since the early 1990s. A key partner is the Thai NGO Coalition on AIDS (TNCA), a network of 168 Thai NGOs, which aims to improve the quality of life of PLHIV. It is notable that the Bureau of AIDS, TB and STIs (BATS) not only worked in close partnership with TNCA from the beginning of the epidemic, but also provided it with an annual budget of \$65–90 million to support their activities. TNCA was seen, along with the Thai Network of People Living with HIV/AIDS (TNP+), as an equal partner in the AIDS response, with a dedicated line of funding from the NHSO.

Apart from working closely with the government, Thai civil society has successfully held governments accountable, and championed the cause of equal access. For example, on 30 November 2001, 1200 PLHIVs from all parts of the country demonstrated in front of parliament and met with Minister of Public Health. The minister agreed, in principle, to their demands, and doubled the budget for ART and also committed the government to include ARVs in the universal health scheme. The working committee, which consisted of representatives from TNP+, NGO/AIDS and the government, was set up to prepare for implementation of the scheme. At that time, there were fewer than 4000 individuals receiving ART. Arguably, civil society action has been fundamental in shaping government policy, an illustration that a well-informed and motivated civil society, which is able to negotiate and partner with government agencies, can be highly beneficial to the AIDS response.

Conclusions

We conclude by noting that, despite the outstanding successes of Thailand’s AIDS response, the programme is faced by a multitude of challenges. A key dilemma is how to position HIV in the era of the sustainable development goals and move towards ‘Ending AIDS’. HIV is a chronic disease, and in the context of Thailand’s ageing population, it poses the twin challenges of maintaining life-long quality services for HIV patients and sustaining behavioural change to maintain primary prevention gains. Keeping the focus of policymakers and health administrators

on ‘Ending the HIV epidemic’ requires consistent advocacy, evidence-based cost effectiveness and innovative approaches to addressing shortages of human resources.

Stigma and discrimination in healthcare settings is still a major obstacle to a more effective response to HIV. Observed behaviours towards KAPs among health staff in two Thai provinces indicate disturbing levels of discrimination [38]. Thailand has also struggled with ongoing policy and legislative barriers that have an impact on access and quality of services. Despite recent progress in reducing barriers to access (for example, no further requirement for parental consent for HIV testing in young people; a pilot harm reduction policy in 19 provinces; and health insurance for healthcare for migrants) Thailand has a rocky road to travel before ending AIDS [24]. Some regulations, such as those that only allow a ‘medical technologist’ under the responsibility of a physician to provide HIV test results, do not promote community-based testing.

To support Thailand in achieving the ambitious ‘Fast Track’ End AIDS and move towards the attainment of the Sustainable Development Goals, the Ministry of Public Health and other partners are working towards establishing policies and systems to increase funding flows to community partners at national and regional levels, including the accreditation of community services, and continuing ‘test and start ART’ for all HIV-infected people. The Ministry of Public Health is also implementing a programme to reduce system-wide stigma and discrimination in healthcare settings, and address human rights concerns.

In order to ‘End AIDS’, Thailand will need to focus on areas that enhance the ability of the programme staff, service providers, health insurance agencies, civil society partners and PLHIV to work in a co-ordinated manner, and develop the capacity of the health and community system to move beyond a ‘control’ agenda to an ‘Ending AIDS’ agenda.

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Declaration of conflict of interest

The authors do not have any conflict of interest to declare.

Disclaimer

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India's HIV programme: successes and challenges

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Abstract

Over the last two decades, India's National AIDS Control Programme (NACP) has evolved and expanded to provide HIV prevention, testing and treatment services countrywide. Scaling up has been uniform across all strategic components and has not only halted, but also reversed, the spread of the epidemic and ensured a major reduction in the number of AIDS-related annual deaths. As the epidemic has been driven by key populations, there was a special focus on these groups from the outset, with various innovative strategies for prevention and testing services. The treatment component has also been scaled up over the years through various models of service delivery that ensured access to free antiretroviral therapy for eligible HIV-infected patients. The programme, now in its fourth phase, has to ensure that new policies and strategies are developed in view of the global UNAIDS targets. The scale up over the years has ensured access to services; however, it is now important to ensure the quality and sustainability of newer models of interventions to ensure that the 2030 sustainable development goals are achieved.

Keywords: National AIDS Control Organization, India, HIV, success, challenges

Introduction

India, the second most populated country in the world, is home to an estimated 2.1 million people living with HIV (PLHIV) [1], the third highest population globally after South Africa and Nigeria. The HIV epidemic in India is highly heterogeneous. It is concentrated in specific regions of the country and in high-risk groups (HRGs) such as people who inject drugs (PWID), female sex workers (FSW), men who have sex with men (MSM) and transgender people. HIV prevalence among all adults (15–49 years) has been declining steadily from 0.38% in 2001 to 0.26% in 2015, while among FSW, MSM and PWID it remains at 2.2%, 4.3%, and 9.9%, respectively. Over the period 2000–2015, the annual estimated number of new HIV infections has decreased by 66%, while the number of annual AIDS-related deaths has decreased by 54% since 2007 (Table 1)[1].

India's National AIDS Control Programme (NACP), implemented by the National AIDS Control Organization (NACO) under the Ministry of Health and Family Welfare, is one of the most successful public health programmes in India today (Figure 1). Started in 1992, with the objective of understanding the HIV disease burden and epidemiological trends [2,3], the programme has now evolved into a major public health prevention and treatment programme. It is supported financially by the Government of India (63.4%), the Global Fund and the World Bank (23%), and other multilateral and bilateral agencies [4]. Over the last two decades, four phases of the NACP have been implemented, each with a duration of 5 years. The focus in each phase has been on improving coverage of comprehensive HIV prevention, care and treatment services nationwide. The NACP IV (2012–2017) was launched with the aim of consolidating gains made to date, accelerating the process of reversal and further strengthening the response to the epidemic in India. Its objectives include: (1) reduce new infections by 50% from the 2007 baseline of NACP III; and (2) provide comprehensive care and support to all persons living with HIV/AIDS, and treatment services for all those who require it [5].

This article presents an overview of the key components of the NACP IV, highlights the policy and programme actions to improve

access to key services, evaluates progress towards achieving the NACP IV targets, and discusses the challenges and way forward to strengthen the epidemic response in India.

Health sector response to HIV

HIV prevention for high-risk groups and bridge populations

Prevention services for high-risk groups and bridge populations (e.g. migrants and truck drivers; Table 2, Figure 2) have been scaled up nationwide through targeted-intervention projects. These provide a comprehensive package of prevention, support and linkage services through an outreach-based service delivery model implemented by non-governmental and community-based organisations. Under NACP IV, targeted-intervention services include needle/syringe exchange programmes and oral-substitution therapy for PWID, condom promotion and distribution, and linkage to HIV and sexually transmitted infections (STI) testing and treatment services. Furthermore, many new HIV prevention initiatives such as interventions for migrant workers and focused strategies for transgender people have been initiated under NACP IV.

Against a target of 2459, there were 1840 targeted-intervention projects in the country in 2014–2015, which were successful in reaching nearly 5.6 million people. In 2014–2015 the coverage of the core HRGs, FSWs, MSM and PWID was 80%, 68% and 75%, respectively [4]. However, concerns such as inequality, stigma and discrimination, especially among HRGs, still remain predominant [7,8].

Moving forward, the following steps are being taken to reach the prevention targets set out in NACP IV:

- Greater involvement of PLHIV to address stigma and discrimination.
- Planned demonstration of the oral pre-exposure prophylaxis (PrEP) project as part of an HIV combination preventive intervention for sex workers.
- Test and treat for key populations will be initiated under the support of the Global Fund's New Funding Model [9].

HIV counselling and testing

When moving towards ending the HIV epidemic by 2030, one of the key challenges remains to ensure that PLHIV, especially those in key populations, are aware of their status so that they can be

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Table 1. Burden of HIV in India [1]

Year	Estimated number of new HIV infections in adults (children)	Estimated number of HIV infections	Prevalence (%)	Number of annual HIV-related deaths
2007	106,335 (21,000)	2,225,930	0.34	150,000
2008	96,124 (20,000)	2,198,559	0.32	140,000
2009	88,234 (18,000)	2,174,594	0.31	130,000
2010	84,827 (17,000)	2,156,452	0.30	120,000
2011	82,100 (17,000)	2,146,839	0.29	110,000
2012	80,458 (16,000)	2,143,446	0.28	100,000
2013	78,613 (15,000)	2,127,958	0.27	90,000
2014	77,351 (12,000)	2,119,881	0.27	80,000
2015	75,948 (10,000)	2,116,581	0.26	68,000

Table 2. Prevalence of HIV/AIDS in select populations [6]

	2004	2005	2006	2007	2008–09	2010–11	2014–15
ANC	0.95%	0.90%	0.60%	0.49%	0.49%	0.40%	0.29%
FSW	9.43%	8.44%	4.90%	5.06%	4.94%	2.67%	2.20%
MSM	7.47%	8.74%	6.41%	7.41%	7.30%	4.43%	4.30%
PWID	11.16%	10.16%	6.92%	7.23%	9.19%	7.14%	9.90%

ANC: antenatal care; FS: female sex worker; MSM: men who have sex with men; PWID: people who inject drugs.

linked to life-saving antiretroviral treatment (ART) to prevent HIV morbidity, mortality and transmission. The national HIV testing guidelines have been revised over the years to keep pace with the World Health Organization (WHO) guidelines and recommend client-initiated voluntary counselling and testing and provider-initiated testing and counselling for pregnant women, people infected with TB and STI patients. Under the NACPs, a network of 18,829 stand-alone, mobile, facility-integrated and public-private partnered integrated counselling and testing centres have been established across the country to provide HIV testing and counselling services (Figure 3).

In India, nearly 24 million adults and 300,000 children use HIV testing services annually. Among these, approximately 200,000 adults and 9000 children were identified as HIV positive in 2015. Of the estimated 2.1 million PLHIV, approximately 67% were aware of their HIV status in 2015. Although the national testing guidelines recommend HIV testing every 6 months for key populations, coverage remains low as reflected by TI programme data: 70% of MSM and 64% of PWID were tested in the last 12 months (Global AIDS Response Progress Reporting 2016).

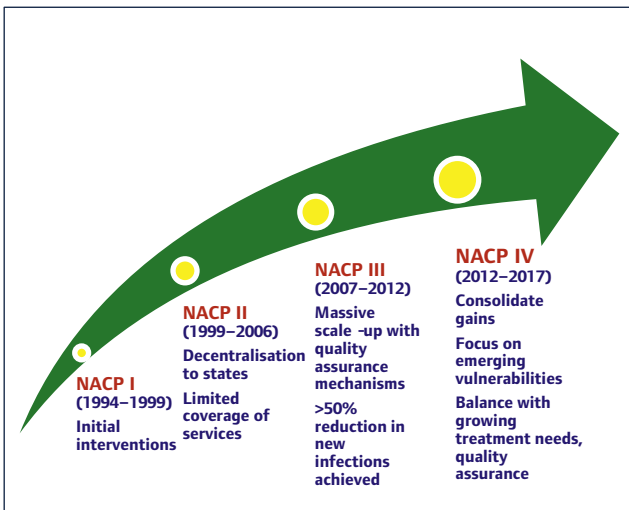


Figure 1. The development of National AIDS Control Programme (1994–2017)

In order to achieve the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90-90-90 targets, that is 90% PLHIV tested and aware of their status, 90% of those to be on ART and of those, 90% to be virologically suppressed, some ongoing activities require scaling up while at the same time new activities need to be planned to improve HIV testing rates, especially among key populations:

- The national guidelines are being updated according to the 2015 WHO consolidated HIV testing services guidelines to recommend community-based testing for HRGs using lay providers.
- Demand promotion strategies using mid-media are being implemented, for example National Folk Media Campaign Red Ribbon Express and buses.
- The Ministry of Health and Family Welfare is planning to launch a new campaign: ‘I know my HIV status’ to encourage people to get themselves tested and declare their

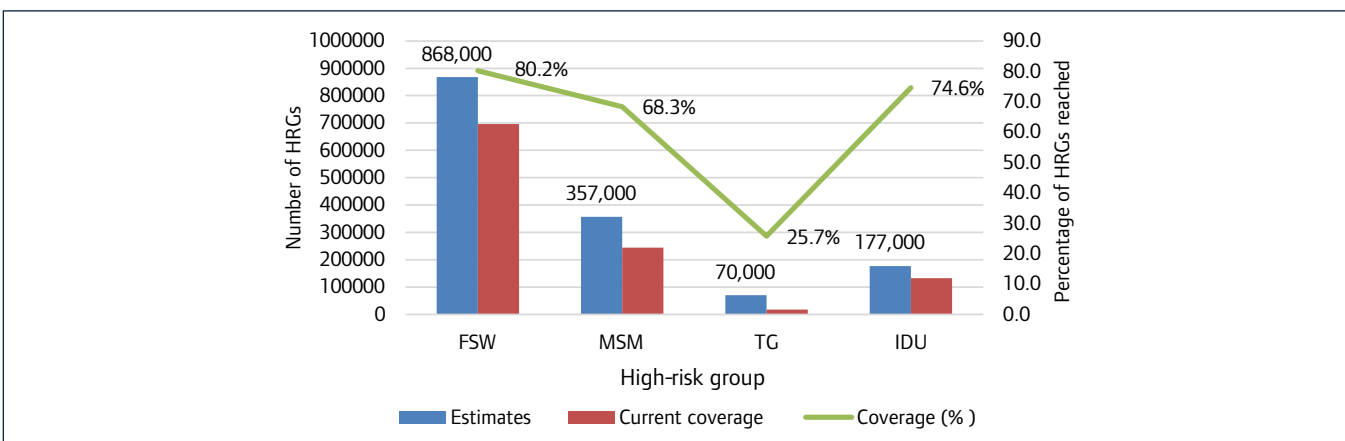


Figure 2. Coverage of core high-risk groups 2014–2015 (FSW, MSM, PWID)

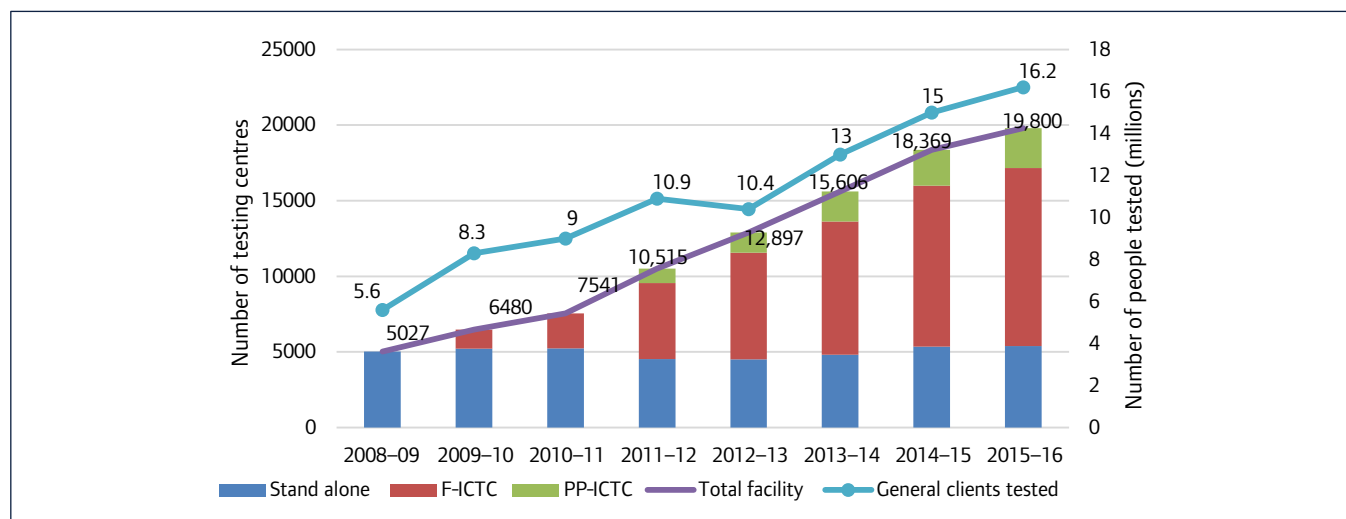


Figure 3. Scale up of HIV testing in India (adults and children). F-ICTC: facilitated integrated counselling and testing centre; PP-ICTC: public-private partnered integrated counselling and testing centres

HIV status on social media. The campaign will serve the objectives of addressing the stigma associated with HIV and getting people to opt in for testing and treatment.

Prevention of mother-to-child transmission of HIV (PMTCT)

Eliminating paediatric HIV by 2020 has been high on the agenda but with limited progress to date. The national guidelines recommend provider-initiated testing and counselling for pregnant women across the country by the general health system [10]. Under NACP IV, a multidrug regimen for all pregnant women living with HIV, irrespective of their CD4 cell count, was recommended in keeping with international guidelines. Also, new initiatives such as point-of-care testing using whole blood finger prick for pregnant women has been initiated for those who do not come to health facilities for antenatal care in order to ensure better coverage.

However, the 2015 data suggest that of the approximate 29.5 million annual pregnancies in India, only 15 million (50%) pregnant women were tested for HIV. Of these, nearly 13,000 were diagnosed with HIV. This accounts for only 35% of the estimated 35,000 HIV-positive pregnant women in India. The most important reasons for the low levels of HIV testing among pregnant women include late antenatal care registration (less than 50% register in first trimester) and the limited reach of HIV testing services for pregnant women in low HIV prevalence states, which contribute about 57% of the total burden of HIV-positive pregnant women. Once diagnosed, 97% of HIV-positive pregnant women received antiretroviral therapy for PMTCT. Elimination of paediatric HIV in India requires significant improvements in uptake of HIV testing among pregnant women. In fact under the Reproductive, Maternal, Newborn and Child Health plus Adolescent (RMNCH+A) programme of the National Health Mission, India's Ministry of Health has launched an integrated action plan for PMTCT of HIV and syphilis. It will ensure that HIV and syphilis testing is part of the essential ANC package delivered across the country by the general health system [11].

HIV treatment

Since the roll-out of free HIV treatment services in 2004, this is an area where gains have been more visible as PLHIV are living longer and have a better quality of life (Figure 4). The national ART guidelines have evolved over the years to keep pace with WHO guidelines in the face of new evidence in favour of an earlier initiation of ART. Since 2013, ART is provided irrespective of CD4 cell count for pregnant women (option B+), PLHIV co-infected

with TB or viral hepatitis, and children below the age of 5 years. Since April 2015, the Indian Government has agreed to start ART for asymptomatic PLHIV at CD4 cell counts ≤ 500 cells/mm³ as recommended by the 2013 WHO guidelines. Furthermore, ART as a fixed-dose combination of tenofovir, lamivudine and efavirenz was introduced in the National Programme in 2013. The establishment of treatment service facilities has been scaled up significantly to 519 ART centres, 1094 link ART centres and third-line ART under the programme has also been introduced earlier this year.

At the end of 2015, 925,000 PLHIV were receiving ART nationwide with a coverage of 44% among the estimated number of PLHIV and 66% among people living with diagnosed HIV (UNAIDS target: 90% by 2015) (Figure 5). With the extended ART eligibility criteria, it may be possible to have 1.2 million people on ART by end of 2016.

To strengthen the ART programme, NACO has piloted an integrated tool with quality-of-care indicators and early warning indicators for HIV drug resistance [11]. Even though retention rates were high and pharmacy dispensing practices have been adhered to, concerns regarding the emergence of drug-resistant HIV are relevant in mature programmes as in India. The National Programme, with technical support from WHO, has phased in the use of this tool across 260 ART sites since 2014 [12]. Since 2015, India has also committed to provision of annual viral load testing for monitoring patients on treatment. Currently, there are only nine viral load laboratories in the country. Several options are being considered to ensure availability of annual testing, including an increase in the number of laboratories; the outsourcing to quality-assured private laboratories; and the use of nucleic acid-based test (NAT) technology for viral load testing using point-of-care GeneXpert. This platform is extensively used by the tuberculosis programme and has been validated.

Management of HIV comorbidities

The HIV/TB collaboration and optimisation of their respective resources has been boosted in 2015 for the scale up of provider-initiated testing and counselling for TB patients and the 'Three I's for HIV/TB' – intensified TB case finding, isoniazid preventive therapy (IPT), and TB infection control. NACO and the Revised National TB Control Programme (RNCTCP), with the support of WHO, have developed the capacity for 30 ART centres to detect TB among PLHIV using cartridge-based nucleic acid amplification tests and provide treatment. Under NACP IV, implementation of

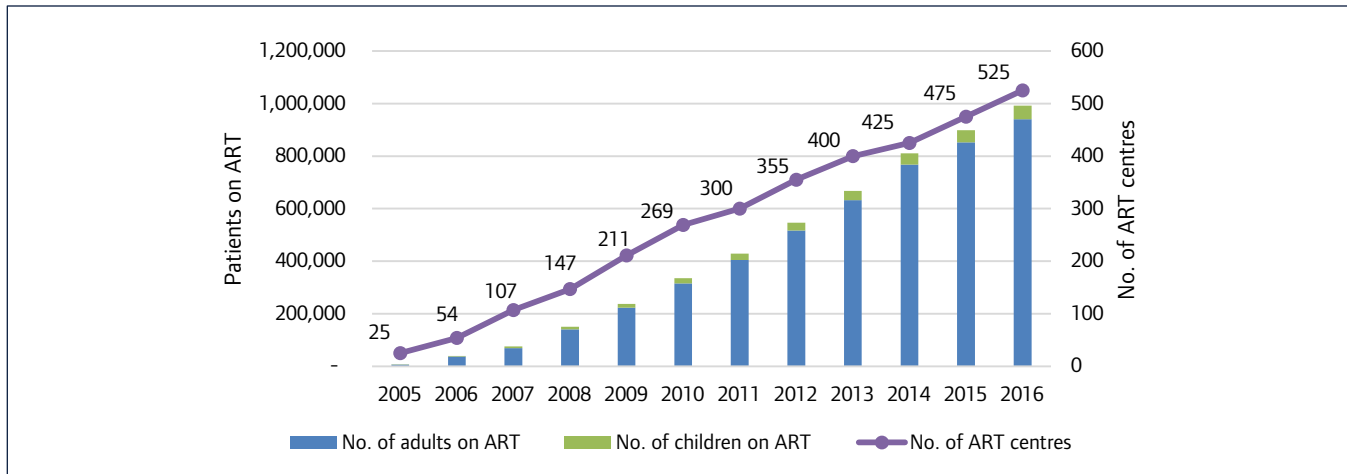


Figure 4. HIV treatment scale up in India

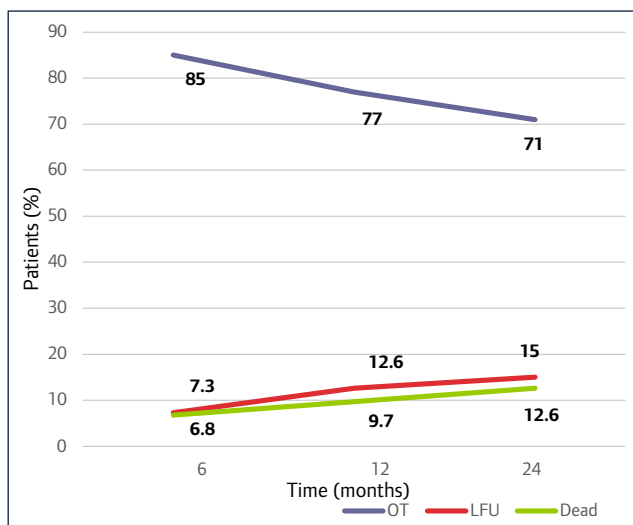


Figure 5. Treatment retention cascade (early-warning indicator results)

operational guidelines for provider-initiated testing and counselling among presumptive TB cases, isoniazid preventive therapy plans, and national airborne infection control guidelines in HIV care settings have also been prioritised and members of staff across ART centres are currently being trained. In 2014–2015, analysis of patient samples was performed across 70 ART centres throughout India and, of the 9468 patients sampled, TB was diagnosed in 1871 (19.7%) with the time between anti-tuberculosis treatment and ART initiation of 2–8 weeks for 65% of patients who were not already on ART. The median time was 23 days [12].

With the HIV treatment programme maturing, there has been a realisation that in order to optimise the ART benefits, co-infections with hepatitis B and C, and kala-azar also need to be managed. Hepatitis C, which is common among members of key populations, especially PWID, is a major concern in certain parts of India [13]. Following a policy dialogue with WHO and other partners, the Indian government has decided to develop a strategy for the treatment of hepatitis C in PLHIV. Similarly, in 2015, NACO in collaboration with the National Vector Borne Diseases Control Programme, developed guidelines for the diagnosis and treatment of kala-azar in this population.

Challenges and the way ahead

The Indian HIV programme has evolved, expanded and implemented various new initiatives over the years. The national

HIV programme has, so far, been a success story, however, challenges and gaps remain, including stigma and discrimination and access to testing services for people from certain sections of society. The other major challenge that the programme faces is funding. With declining funding from external donors, access to the domestic budget has progressively increased but has been slow. As a result, newer policies and strategies such as ‘test and treat’ might be difficult to implement. As India has a large number of PLHIVs, any change in policy has major financial implications. The global vision and sustainable development goal to end AIDS by 2030 requires initiating all PLHIV on ART irrespective of CD4 cell count as per the 2015 WHO antiretroviral therapy guidelines [14]. The UNAIDS 90:90:90 targets have been designed in a manner that would help countries to plan further strategies that would ensure the end of AIDS [15].

The Indian government needs to align its policies and strategies with the global target of ending AIDS by 2030. To meet this goal, UNAIDS 90:90:90 targets need to be achieved and the country first needs to identify the detection and treatment gaps in high-burden areas and key affected populations and address them. Work starts from the identification of people with HIV, then carries on through their linkage to treatment services. NACP IV, along with WHO, is working to develop a treatment cascade that will identify gaps in the HIV care cascade. Any gaps identified could then guide policy makers in modifying strategies accordingly so that the country can proceed towards achieving targets. National surveillance of HIV drug resistance levels is a priority before the end of NACP IV. After the completion of NACP IV in 2017, with additional well-led initiatives, political commitment, active engagement of civil society, and additional funding, India could demonstrate that it is indeed possible to end AIDS by 2030. It will require acceleration of current efforts and scale up of innovations in order to change the trajectory of the response.

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Disclaimer

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Evolution of the health sector response to HIV in Myanmar: progress, challenges and the way forward

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Abstract

Critical building blocks for the response to HIV were made until 2012 despite a series of political, social and financial challenges. A rapid increase of HIV service coverage was observed from 2012 to 2015 through collaborative efforts of government and non-governmental organisations (NGOs). Government facilities, in particular, demonstrated their capacity to expand services for antiretroviral therapy (ART), prevention of mother-to-child transmission (PMTCT) of HIV, tuberculosis and HIV co-infection and methadone-maintenance therapy (MMT). After nearly three decades into the response to HIV, Myanmar has adopted strategies to provide the right interventions to the right people in the right places to maximise impact and cost efficiency. In particular, the country is now using strategic information to classify areas into high-, medium- and low-HIV burden and risk of new infections for geographical prioritisation – as HIV remains concentrated among key population (KP) groups in specific geographical areas. Ways forward include:

- Addressing structural barriers for KP to access services, and identifying and targeting KPs at higher risk;
- Strengthening the network of public facilities, NGOs and general practitioners and introducing a case management approach to assist KPs and other clients with unknown HIV status, HIV-negative clients and newly diagnosed clients to access the health services across the continuum to increase the number of people testing for HIV and to reduce loss to follow-up in both prevention and treatment;
- Increasing the availability of HIV testing and counselling services for KPs, clients of female sex workers (FSW), and other populations at risk, and raising the demand for timely testing including expansion of outreach and client-initiated voluntary counselling and testing (VCT) services;
- Monitoring and maximising retention from HIV diagnosis to ART initiation and expanding quality HIV laboratory services, especially viral load;
- Prioritising integration of HIV and related services in high-burden areas;
- Increasing the proportion of PLHIV receiving testing and treatment at public facilities by improving human resources and increasing public facilities providing these services to ensure sustainability;
- Obtaining intelligence and tailoring services in hard-to-reach/under-served areas;
- Strengthening planning, monitoring, and coordination capacity especially at regional levels.

Introduction: Myanmar in context

Myanmar is classified as a lower-middle-income and a least developed country in Southeast Asia with a population of 51.4 million [1]. Administratively, the country is composed of NayPyiTaw union territories and 14 states and regions. More than 60 years of internal conflict, military rule, and sanctions from international governments have affected the country's economic growth and development. The total health expenditure in Myanmar, 1.7–2.3% of its gross domestic product (GDP) between 2001 and 2014, is among the lowest in the Asia Pacific region.

Myanmar detected its first case of HIV from a person who injected drugs in 1988 and the first AIDS case was diagnosed in 1991. Between 1990 and 2000, prevalence remained elevated in high-risk groups, notably people who inject drugs (PWID) peaking alarmingly at 74.3% in 1993, men who have sex with men (MSM), and female sex workers (FSWs), peaking at 38% in 2000. Over the following decade (2001–2010), the epidemic reached clients of sex workers and partners of PWID, and female sexual partners of men who are from key population groups, leading to vertical transmission of HIV to their newborns. National level HIV prevalence was estimated to be 28.5% among PWID in 2014, and 14.6% among FSW and 11.6% among MSM in 2015 according to the AIDS

Epidemic Model (AEM) based on the Integrated Bio-Behavioural Surveillance (IBBS) surveys among key populations and HIV sentinel surveillance (HSS). According to the AEM in 2015, the highest proportion of new infections was among PWID (28%) from the use of contaminated injecting equipment, followed by 'low-risk' women (24%), and FSW clients (23%). New infections in 2015 were estimated to be 11,763, approximately 32 new infections daily, according to Spectrum 2016. The overall HIV epidemic in Myanmar seems to be declining with HIV prevalence among adults, 15 years and older, estimated to be less than 0.6% nationally. There were an estimated 224,795 people living with HIV (PLHIV) including those aged under 15, one-third of whom were female. The severity of the HIV epidemic in Myanmar varies widely by geographical area. HIV prevalence in some locations in Myanmar is among the highest in the Asia-Pacific region. Approximately 65% of KPs are estimated to be in five regions and states (Mandalay, Yangon, Sagaing, Kachin and Shan North), largely in urban areas. In Yangon, among MSM, the HIV prevalence at 26.6% is the highest in a specific geographical location in the Asia-Pacific region, higher than Bangkok at 24.4% in 2012. Whereas in some townships in Kachin and Shan North, nearly one in two PWID who participated in the 2014 IBBS survey tested HIV positive.

In financing the HIV response, Myanmar has received external funding support since 2002, albeit with some challenges. In 2003, the Fund for HIV in Myanmar (FHAM) was established by Norway, UK, Sweden and the Netherlands. The Three Diseases Fund (3DF),

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a multi-donor trust fund was formed in 2006 to replace the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) grant upon withdrawal from the country. The FHAM was merged into the new fund to provide much needed assistance for HIV, tuberculosis (TB) and malaria. The 3DF then transitioned into the Three Millennium Development Goal Fund (3MDG), which was launched in 2012 by seven bilateral donors (Australia, Denmark, European Union, Sweden, Switzerland, United Kingdom and USA) to support maternal, newborn and child health (MNCH), HIV, TB and malaria, and health systems strengthening. Following the termination of a previous grant, the GFATM grant Round 9 was re-established in Myanmar in 2011 and continued as the New Funding Model (NFM) through 2016 [2]. As of 2015, GFATM is the single largest financing source covering 50% of the HIV response in Myanmar. Its funding beyond 2016 is being explored. Responding to HIV is a national priority, as evidenced by increasing domestic funding. The proportion of Government spending as part of total HIV expenditures increased from 2% (US\$ 0.6 million) in 2012 to 7.7% (US\$ 4.1 million) in 2013, and even further to 12.3% (US\$ 10.4 million) in 2015 [3]. The change from military rule to a civilian government in 2011 brought increased support from both government and donors. A newly established government in April 2016 will potentially bring additional increased external resources to health and development in Myanmar.

This article reviews and documents Myanmar's response to the HIV epidemic over the last decades (1990–2016) and how it is moving towards the goal of ending the AIDS epidemic as a public health threat.

Review methods

The review is based on a literature review of available data, documents and reports (published and unpublished), validated with key partners (National AIDS Programme, WHO, and UNAIDS).

Review findings

This article describes Myanmar's response to HIV of nearly three decades in a nutshell, and the continuous efforts taken to strengthen policy and strategic directions, overcome challenges and attempts to reach the goal of ending AIDS by 2030. In particular, this review focuses on the building blocks of the country's response through four phases (Table 1).

Response: 1991–2000

Government recognition of HIV

An inter-sectoral National AIDS Committee chaired by the Minister of Health was established in 1989 and provided oversight. A short term plan for the prevention and control of HIV transmission was launched that same year. The first national medium-term plan for prevention and control of HIV/AIDS was formulated in 1991, followed by a joint plan by the National AIDS Programme (NAP), Ministry of Health, and the United Nations Development Programme (UNDP) in 1994. In the late 1990s, several collaborative projects were undertaken with the support of UN entities and bilateral agencies to enhance efforts for HIV prevention and care [4]. A limited number of international non-governmental organisations (INGOs) worked directly, or through a few national civil society organisations, with key populations such as PWID and FSW.

Information, education and communication (IEC) across different sectors

A multilingual public education campaign was adopted as a multi-sectoral approach by several Ministries. HIV prevention, in particular IEC for key populations with HIV/AIDS and peer

education for PWIDs were the mainstay of the national programme. Counselling, STI education and treatment were provided to FSWs by 45 STI/AIDS teams in priority townships and via NGOs. HIV testing and confirmation was performed only at government-assigned laboratories, leading to delays in providing test results.

HIV sentinel surveillance

The national programme started systematic surveillance among key population groups in selected geographical areas in 1991. Biennial HIV sentinel surveillance (HSS) [5] was established in 1992 among different population groups (PWID, sex workers, male and female patients with sexually transmitted infections, pregnant women and military recruits), along with HIV surveillance among blood donors.

Response: 2001–2010

The 100% Targeted Condom Programme (TCP)

In 2001, the government started a 100% targeted condom programme (TCP) in sex-work settings and rapidly scaled up from four sites in 2001 to 170 sites in 78 townships by 2010 [6]. Client-oriented STI services, free distribution and social marketing of condoms, voluntary counselling and confidential testing (VCCT) were scaled up through the public and private network of service providers. In 2008, 95% of FSWs reported condom use with the most recent client while 77.6% of PWID used a condom at last sex (Progress Report 2008, National Strategic Plan for HIV/AIDS in Myanmar). Targeted outreach programmes became increasingly community-centred by 2006, being run mostly by their own members: sex workers, MSMs and PWID [7].

New sources of funding

In 2004, following the termination of the grant from the Global Fund to Fight Against AIDS, Tuberculosis and Malaria (GFATM), the Fund for HIV in Myanmar (FHAM) was subsequently established, with technical support from UNAIDS, bringing significant resources to the response. A group of donor countries formed the Three Diseases Fund (3DF) to support HIV efforts and continued as the Three Millennium Development Goal Fund (3MDG Fund) providing joint donor support and expanding to encompass maternal and child health and longer-term sustainability. The 2009 Global Fund 9th Round (January 2011–31 December 2012) was later integrated as a single-stream grant with the New Funding Model (NFM; 2013–2016).

First National Strategic Plan

The First National Strategic Plan 2006–2010 was developed by the government and international partners including INGOs, and was then funded by the 3DF to implement the following provisions.

Interventions targeting PWID and FSW were expanded by NGOs and INGOs. Needle and syringe distribution grew five-fold from 2005, from 545,000 needles and syringes to nearly 7 million distributed by 2010. In addition, 1101 PWID were receiving methadone [8]. Services for PWID were geographically concentrated in only three areas (Shan state, Kachin state and Mandalay division) as these were economic and trade zones for opium with noted higher HIV prevalence [9].

Small scale projects for MSM initiated by NGOs and INGOs provided condoms, lubricants and other HIV prevention interventions. IEC was provided through peer outreach focusing on hard-to-reach MSM. VCCT and STI services were provided by private and public sectors.

Initially, VCCT and other HIV testing and counselling (HTC) services were provided only by the public sector and at sentinel surveillance

Table 1. The four phases of the health sector response to HIV: key features and milestones

	Phase 1 (1991–2000)	Phase 2 (2001–2010)	Phase 3 (2011–2016)	Phase 4 (2016–2020)
HIV epidemic	First HIV case detected in 1988 [19] from PWID; nearly three-quarters of new infections are among PWID. FSW and clients also affected [20]	Adult HIV prevalence peaked at 0.74% in those aged over 15 years 2005 [20]; MSM and low-risk females became strongly affected by the epidemic	Adult prevalence declined to 0.59% in 2015 [20]; PWID and MSM contributing an increased proportion of new infections	Geographical prioritisation for HIV services across the continuum, based on the local burden and risk; differentiated service delivery in high-, medium- and low-burden townships
HIV prevention for key populations	IEC and peer education for FSW and PWID; multi-sectoral and multilingual public education campaign by several Ministries;	100% Targeted Condom Programme (TCP) expanded to 154 sites in 2005 [21]; drop-in centres initiated for KPs;	Interventions for SW, PWID, MSM expanded through public, private and NGO sectors [22]	Reorient KP interventions to reach higher risk KPs; increase HIV testing coverage, and strengthen linkages across continuum by real-time mapping, community HTC, KP service centre and case management approaches
Testing and counselling	HIV testing only in main cities; counselling services for KPs provided at AIDS/STI services and NGO sites	PITC for pregnant women scaled up to 210 township sites; PITC provided for KPs by private practitioners	Expansion of PITC for PMTCT and TB/HIV; VCCT by AIDS/STI teams in 45 districts; decentralised HTC since 2013 and community-based HTC since 2014 through qualified NGO sites and basic health staff	Intensify the right HIV testing approaches in the right places for the right people through expanding community HTC for KPs, VCCT for other vulnerable populations including FSW clients, KP partners, and unreached KPs, VCCT in closed settings and PITC for PMTCT and TB/HIV
Care and treatment including PMTCT	STI prevention and treatment by AIDS/STI services and NGO sites	By 2010, 38 public sector hospitals were providing ART; 210 townships PMTCT, and paediatric ART through network with ART hospitals; TB/HIV collaboration expanded to 11 townships. Interventions for KPs expanded by NGOs/INGOs; PLHIV peer support groups and network emerged.	ART facilities increased to 269 by 2015, including 82 public sector ART initiation sites (including 72 hospitals), 137 ART maintenance sites and 50 NGO sites; PMTCT and TB/HIV collaboration expanded to 301 and 236 townships, respectively by 2015.	Further expansion of ART with increased domestic funding; transition from NGO to public sector; including standardising treatment support package across NGO and public sectors; integrated/co-location service delivery including HTC, ART, TB/HIV and PMTCT to minimise physical referral especially in high burden areas; individual case monitoring and response system to better track patients across the care continuum; expansion of viral load and EID testing
Strategic information	Behaviour surveillance, HIV surveillance since 1992	HIV estimates and projections produced since 2003 using AEM and Spectrum	New HIV estimates and projections developed in 2012 and 2014/2015 for PWID, MSM and SW as part of the IBBS survey	Adjusting surveillance approaches including electronic case-based reporting system using DHIS2; regional epidemic profiles and plans, especially in high-burden townships; obtaining intelligence and developing services in hard-to-reach/underserved areas
Leadership	In 1988, the NAC was established An inter-sectoral NAC, chaired by the Minister of Health, provided oversight (1989)	Myanmar Country Coordinating Mechanism (M-CCM) played high-level coordination role	MoH allocated US\$1 million for methadone, US\$5 million for ARVs in 2015 in addition to an eight-fold increase of resources for NSP II; programme cost optimisation conducted to identify areas for costs savings and efficiencies	Government transitioning to take a larger leadership role in management and implementation of GFATM grant; strengthen planning, monitoring, and coordination capacity especially at regional level

AEM: Asian Epidemic Model; EID: early infant diagnosis; IBBS: integrated Biological and Behavioural Surveillance; IEC: information, education and communication; KP: key populations; MoH: Ministry of Health; MSM: men who have sex with men; NAC: National AIDS Committee; NGO: non-governmental organisation; PITC: provider-initiated testing and counselling; PMTCT: prevention of mother-to-child transmission; PWID: people who inject drugs; (F)SW: (female) sex workers; VCCT: voluntary confidential counselling and testing.

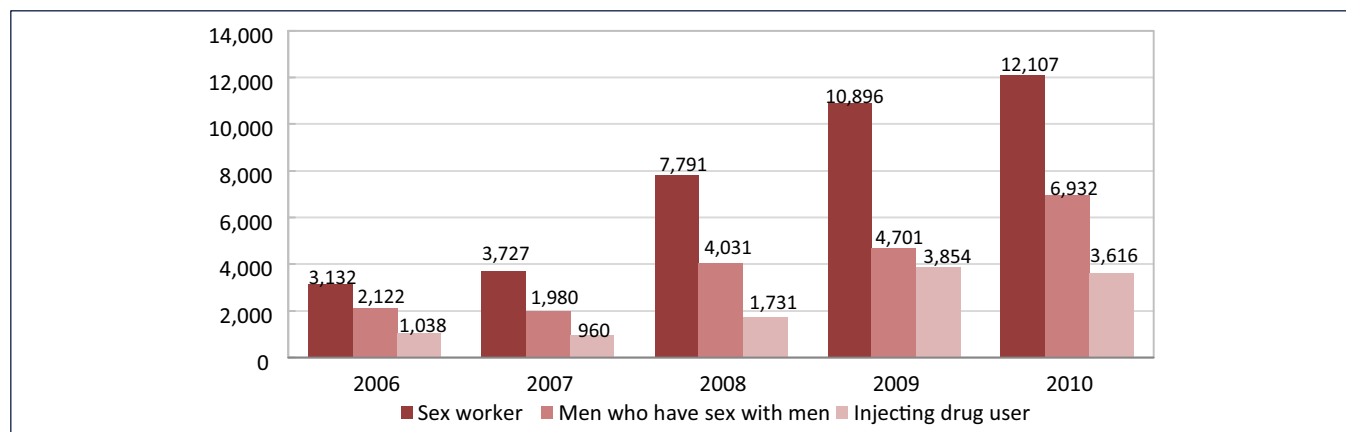


Figure 1. Most at-risk populations received HIV test and post-test counselling 2006–2010. Source: NAP progress report 2010

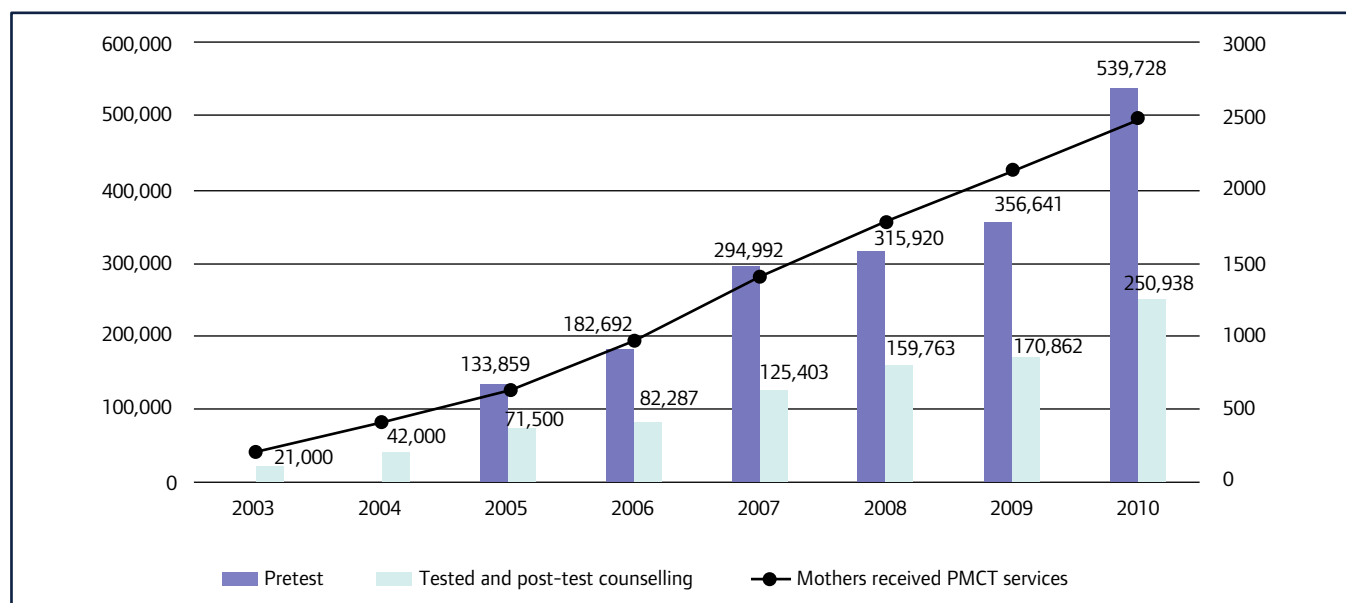


Figure 2. Achievements in PMTCT 2003–2010. Source: NAP review March 2013

sites. INGOs and NGOs started to provide HTC, and referred individuals to public testing and confirmation sites after this process. By the end of 2004, 114 service delivery sites in 69 townships provided HTC including testing for PMTCT. In 2006, Population Services International (PSI), an INGO, was allowed to set up laboratory services for VCCT/HTC in clinics in Yangon and Mandalay. By the end of 2010, the NAP had had provided over 75,000 people with HTC including 22,655 for KPs (Figure 1).

PMTCT roll-out by the government was initiated in 2000 in four townships (Tachileik, Kawthaung, Dawei, and Myawaddy) and community-based public sector activity was extended to institutional-based PMTCT in five public hospitals. By 2010, PMTCT services including treatment for mother-baby pairs expanded through maternal and child health centres and hospitals, supported by NGOs and INGOs, and self-help groups covered 210 townships with 38 hospital-based and 210 community-based services. In 2008–2009, 2488 mother-baby pairs (65% of the 2010 target) received a complete course of two-antiretroviral (ARV) combination prophylaxis (Figure 2).

As early as 2002, a few patients accessed ART from neighbouring countries, and from MSF-Holland. Provision of ART by NAP started in 2005 through five general hospitals and one HIV specialist hospital in Yangon. Between 2001 and 2010, with significant collaboration from INGOs, NGOs, civil society and network groups,

the number of PLHIV receiving ART increased from fewer than 500 in 2004 to reach 29,825 in 2010 (2116 of whom were children) with the public sector caring for over 25% of the total patients (Figure 3).

A network of private general practitioners (Sun Quality Health practitioners), established in 2001, diagnosed and treated STI cases, especially among FSW and MSM. Stand-alone VCCT/HTC was also provided. ART maintenance was piloted in 2008 and expanded to other network clinics in 2010 as part of the decentralisation process.

The Integrated HIV Care (IHC) programme for TB/HIV co-infected patients and families was a joint collaboration between the Ministry of Health, the International Union against Tuberculosis and Lung Disease (IUATLD) and WHO, established in 2005 with departmental referral practised between NAP and the National TB Programme (NTP). Piloting of isoniazid preventive therapy (IPT) for PLHIV started in seven townships in 2007, expanding to 11 townships by 2010 where co-trimoxazole prophylactic therapy (CPT), IPT and initiation of ART as appropriate was provided.

The comprehensive continuum of care (CoC), initiated in 2006, intended to provide comprehensive HIV prevention and care activities, community home-based care for AIDS patients and their families with involvement of basic health staff, NGOs, and

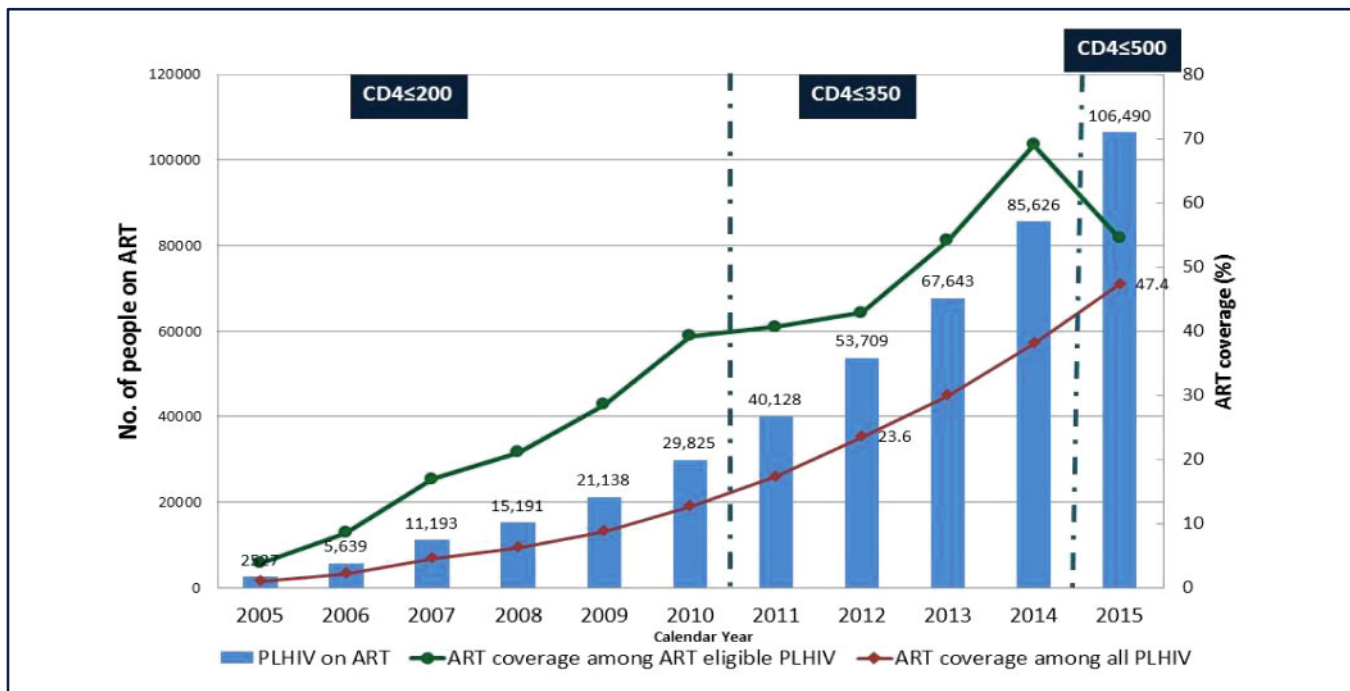


Figure 3. PLHIV receiving ART 2005–2015. Source: ART programme data, Spectrum, April 2016

communities including PLHIVs [10]. PLHIV peer-support networks provided community mobilisation and advocacy, and home-based care and other support services, such as adherence support for ART. Self-help groups of PLHIV increased from 43 in 2005 to nearly 200 in 2010, with members across all states and regions providing socio-economic assistance (e.g. provision of food, loans for income generation and educational support for children)[11]. Seven community networks, including those of MSM, PWIDs, women and sex workers, and NGOs (Myanmar Interfaith Network on AIDS, 3N) and community-based organisations (Myanmar Positive Group) were active as of 2010.

Response: 2011–2015

Second National Strategic Plan

The second National Strategic Plan (NSP II; 2011–2015/16) was developed collaboratively and inclusively with government ministries, international and national partners, civil societies and PLHIV and KP networks, reflecting recommendations generated by the 2013 mid-term review of NSP II. In 2013, the GFATM NFM (1 January 2013–31 December 2016) was used to bridge the funding gap for NSP II by approximately US\$100 million and to return the focus to the planned scale up of the programme [12].

Improved collaboration between governments, NGOs and INGOs, development partners and other stakeholders was seen. The United Nations Office for Project Services (UNOPS) and Save the Children worked closely with NAP and sub-recipients (i.e. INGOs, NGOs, general practitioners, civil societies and networks) to implement the GFATM grant. INGOs, NGOs and general practitioners provided ART, care and support for PLHIV in collaboration with the public sector. Community support groups became increasingly involved in child protection advocacy and social support, working with the Ministry of Social Welfare and civil society groups [13].

Rapid increase of service coverage

Coverage of a range of services increased significantly in implementing NSP II with the GFATM, the government, and other sources including 3MDG, US Government, and MSF Holland during this phase.

KP outreach was expanded to achieve 67%, 53%, and 67% coverage for FSW, MSM and PWID, respectively in 2014. From 2013 to 2015, there was a 67% increase in the number of needles and syringes distributed from around 11 million to 18.5 million, equivalent to an increase from 147 to 223 units per person who injects drugs.

Coverage of ART doubled from 23.6% in 2012 to 47.4% or 106,490 PLHIV people on ART by the end of 2015 [14]. The NAP along with implementing partners increased the number of ART facilities from 147 in 2013 to 269 in 2015, with 82 public ART initiation sites, 137 public ART maintenance sites, and 50 non-government sites. There was a significant decline in the number of HIV-related deaths from 15,601 in 2011 to 9675 in 2015 [15]. Out of the 106,490 patients (adults and children) who were on ART, only 9700 had received a viral load test in 2015.

Provider-initiated testing and counselling (PICT) for pregnant women was progressively integrated in ANC settings nationwide. HIV testing coverage among pregnant women and ARV coverage among HIV-positive pregnant women to reduce mother-to-child transmission (MTCT) were 67.2% and 86.0%, respectively in 2015 [14]. In 2015, 3923 HIV-positive pregnant women received ARVs to reduce the risk of MTCT (2400 received Option B and 1523 Option B+). In 2015, 2169 exposed infants were born and started on nevirapine (NVP) prophylaxis, suggesting that about 46% of all infants born to HIV-positive women were lost to follow-up. The number of infants who received an HIV test within 2 months of birth to ensure early infant diagnosis (EID) was 801 (773 negative, 25 HIV-positive and three indeterminate), suggesting a large loss to follow-up among potentially exposed infants.

PITC was made available at TB service delivery points in 236 townships in 2015 [16]. The proportion of TB patients with known HIV status increased from 60% in 2014 to 74% in 2015, although the proportion of HIV-positive TB patients receiving ART remained low at 38% in 2015.

By the end of 2014, seven townships had 'one stop service centres' with comprehensive services for PWID, which included MMT, ART, TB referral and treatment, STI treatment, counselling, hepatitis

B vaccination, hepatitis C testing, condoms and educational materials [17].

General practitioners were also involved in HIV diagnosis, treatment of opportunistic infections, care for TB and HIV co-infection, ART maintenance, and adherence to the treatment.

Government financial contributions to ART and MMT

The government demonstrated a strong commitment by allocating US\$1 million for methadone in 2014 and US\$5 million for ARV drugs in 2015, in addition to an eight-fold resource increase for the NSP II by the Ministry of Health [18].

The way forward: 2016–2020

Based on the review of NSP II implementation successes and challenges, the Myanmar National Strategic Plan on HIV and AIDS (2016–2020) (NSP III) has been developed. It aims to end HIV as a public health threat in Myanmar by 2030 through fast-tracking access for PLHIV to a continuum of integrated and high-quality services that protect and promote human rights for all. The NSP III defines five strategic milestones for Myanmar to achieve:

- (1) 90% of SW, MSM, PWID, prisoners and migrants have access to combination prevention services;
- (2) 90% of PLHIV know their status;
- (3) 90% of PLHIV who know their status receive treatment;
- (4) 90% of people on treatment have achieved viral suppression;
- (5) 90% of people living with, at risk of and affected by HIV report no discrimination, especially in health, education and workplace settings.

The NSP III intends to ensure highly focused and cost efficient approaches that will provide the right interventions to the right people in the right places. New features of the NSP III include the following:

- Geographical prioritisation through categorisation of townships based on epidemic burden and risk of new infections;
- Differentiation of service delivery approaches for higher impact to reach priority populations and expedite their access to services;
- Continuum of HIV prevention, testing, care and treatment services including strengthened partnerships between the public, INGOs, NGOs, community and private sectors;
- Prioritising integration/co-location of services in high-burden areas;
- Transition to increased public sector management, especially of ART; and
- Streamlined programme costs to ensure savings and efficiency gains from economies of scale and scope.

Regarding the geographical prioritisation, existing data were analysed through a process of triangulating population size estimates of priority populations, known HIV prevalence, reported HIV-positive and TB/HIV-positive data, number of PLHIV on ART and reported PMTCT/HIV-positive data. This analysis resulted in the classification of 85 high-burden townships; 151 medium-burden townships; and 94 low-burden townships. It was estimated that between 63% and 77% of key populations were in high-burden townships, while 76% of adult PLHIV and 78% of adults on ART resided in high-burden townships. Between 19% and 31% of key populations and adults on ART were in medium-burden

townships and only up to 6% of key populations were within low-burden townships.

Each township plans to implement differentiated service delivery approaches. For prevention, in high-burden townships, government and INGO and NGO partners will jointly scale up programmes that are relevant to the needs of the key population through the Key Population Service Centre approach, which includes drop-in-centres, mobile outreach units, peer educators, as well as internet and smart phone-based applications, among other initiatives. Medium- and low-priority townships will receive a standardised basic programme package, consisting mainly of IEC, condom distribution, prevention and HIV testing information, and HIV awareness raising through activities such as World AIDS Day campaigns.

HIV testing will be optimised through intensifying different HIV testing approaches to target different priority populations. Specifically, community HTC for KPs and VCCT for other vulnerable populations including FSW clients, KP partners, and unreached KPs will be prioritised in high-burden areas while PITC for PMTCT and TB/HIV will be made available throughout the country regardless of the level of burden.

ART initiation will be focused in high-burden townships. In medium- and low-burden townships, the ART initiation service will be accessible on-site, or by referral. PMTCT services will continue to be available throughout the country. The NSP III prioritises the transition of ART services from INGOs and NGOs to the public sector. It also aims to increase community involvement in the HIV response and supports the strengthening of community systems. Providing familiarity and interactions with communities and KPs also serves to increase understanding and compassion of public sector healthcare providers towards PLHIV and KPs, ultimately reducing HIV-related stigma and discrimination.

Integrated/co-location service delivery including HTC, ART, TB/HIV and PMTCT should minimise physical referral, especially in high-burden areas, resulting in fewer loss-to-follow-up cases. Individual case monitoring and improved response systems will help to better track patients across the care continuum.

Other focus areas in the NSP III include: building infrastructure and capacity for viral load monitoring and testing, including point-of-care viral load testing in order to achieve viral suppression in ART patients; improving and speeding up treatment of TB patients who need ART; and addressing problems identified around the continued high MTCT rate.

Ultimately NSP III interventions were selected based on those that are most likely to achieve results and impact the epidemic. With rigorous programme and cost-efficiency reviews, the new NSP has identified up to US\$150 million in savings for the duration of the NSP from 2016 to 2020. Through these evidence-informed, results-oriented, innovative approaches, Myanmar strives to reach its goals to eliminate HIV as a public health threat, as part of a wider health agenda that includes providing universal access to health.

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Disclaimer

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From the Millennium Development Goals to Sustainable Development Goals.

The response to the HIV epidemic in Indonesia: challenges and opportunities

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Abstract

Since the first case was reported in 1981, the Indonesian government and civil society have implemented many initiatives to respond to the HIV/AIDS epidemic. From an historical perspective, the country now has the means to rapidly diagnose cases of HIV infection and provide antiretroviral therapy. The concern expressed by international health agencies about a potential major HIV epidemic in the country has not been confirmed, as evidenced by a slowing down of the number cases. The threat from non-sterile needle sharing has been relatively well controlled through harm-reduction programmes; however, drug trafficking remains a challenge. It has reached worrying levels and involves law enforcement units at the forefront of the battle. In parallel, the level of condom use in high-risk behaviour groups seems unsuccessful in reducing infection rates, especially among heterosexuals. The lack of information and the high mobility of the groups at risk of acquiring HIV infection have created tremendous challenges for outreach programmes. Heterosexual transmission represents the most important route of transmission in the country.

When reflecting on the country's 2014 Millennium Development Goals, condom use during high-risk sex only reaches 43.5%, and only 21.3% of young people have a comprehensive knowledge about HIV/AIDS. The 2030 Millennium Development Goal Agenda offers an opportunity to catch up on goals that still need to be achieved. Therefore, efforts are underway to try to halt the epidemic by 2030 and also to ensure that all high-risk populations are included in this effort.

The current state of the HIV epidemic in Indonesia

The HIV epidemic in Indonesia is concentrated among key populations, except in Papua where there is a low-level generalised epidemic. These populations include direct and indirect female sex workers (FSW), men who have sex with men (MSM), *Waria* (transgender people), people who inject drugs (PWIDs) and high-risk men.

In December 2015, 407 districts/cities reported HIV/AIDS cases. The remaining 100 districts/cities had not reported any or had detected no cases [1]. The two most important transmission routes were: (1) unprotected heterosexual intercourse, especially among those who have multiple partners; and (2) needle sharing among PWIDs.

In general, the trend in HIV prevalence among key populations according to the Integrated Biological and Behavioural Survey (IBBS) from the Ministry of Health over 22 districts in 2015 has shown progress towards a decrease in HIV prevalence, apart from among MSM (Figure 1) [4].

The highest HIV prevalence in 2015 was found in PWIDs, but compared with 2007, this shows a decrease from 52.5% to 28.8%. However, between 2007 and 2015 there was a sharp increase in prevalence among MSM from 5.5% to 25.8%, respectively.

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Transmission through heterosexual relationships

The risk of HIV transmission in Indonesia is currently dominated by high-risk heterosexual behaviour (47%) [1], including through buying sex. In the 2015 IBBS [4], the most frequent sex buyers in the previous year were *Waria* (26%), followed by potentially high-risk men (23%), PWIDs and MSM (19% each).

Data from the 2015 IBBS do show indications of success of the HIV/AIDS programmes [4]. For example, comparing condom use among high-risk groups at last sex between 2007 and 2011, the findings are encouraging among direct FSW, although we have not observed the same increase for indirect FSWs and PWIDs. In the 2015 survey of high-risk men, the lowest proportion of those who used condoms at last sex were motorcycle taxi drivers (6.8%) and truck drivers (11.1%).

There is an increasing proportion of individuals who always/consistently use condoms among the indirect FSW group, whereas among direct FSWs and PWIDs, we saw a decrease from 62.1% and 14% in 2011 to 43.4% and 2.5%, respectively. In the 2015 survey, among high-risk men, the groups that had the lowest proportion of those who always used a condom were motorcycle taxi drivers (0.81%) and truck drivers (1.32%) [4].

There have been long-standing programmes providing free condoms in the country. In the 2015 IBBS the highest proportion of those who received free condoms were PWIDs (77.2%), followed by *Waria* (68.1%) and high-risk men (53%). Meanwhile, a decline was noted in the proportion of recipients of free condoms among the direct and indirect FSWs. Sources for distribution of free condoms in 2015 were non-governmental organisations. However, direct FSW and PWID groups also mentioned buying condoms from stalls or shops, while indirect FSWs, high-risk men, *Waria* and MSM bought them in pharmacies or drug stores.

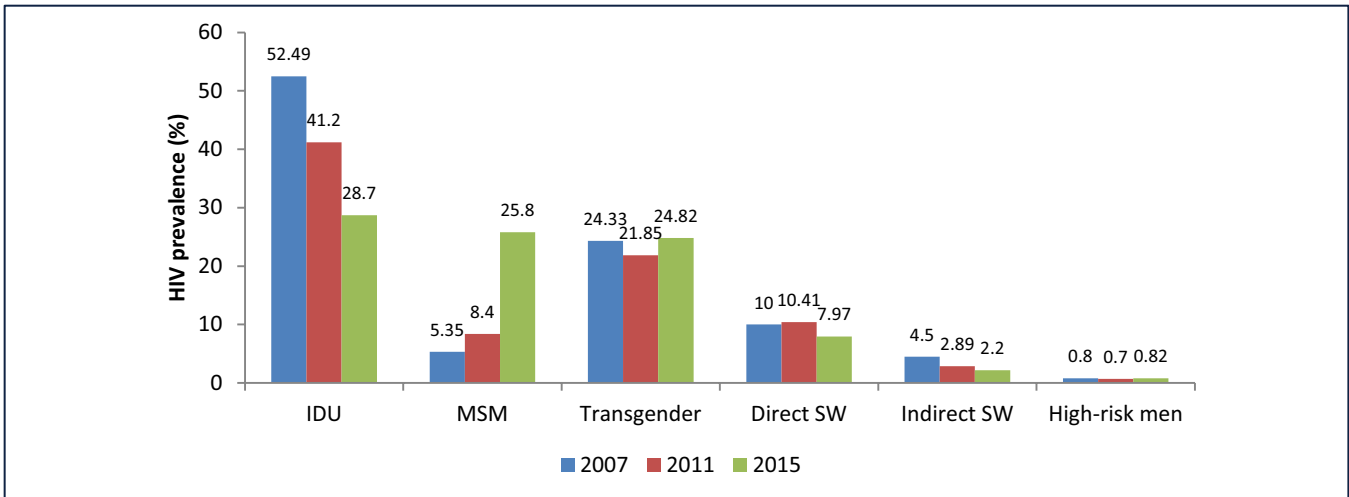


Figure 1. HIV prevalence among affected key populations in Indonesia. PWID: people who inject drugs, MSM: men who have sex with men; DSW: direct sex worker, IDSW: indirect sex worker. Source: Integrated Biological and Behavioral Survey among key populations 2015, Ministry of Health Indonesia [4]

Transmission through injecting drug use

Until 1996 the HIV epidemic in Indonesia was still focused in MSM; however, other high-risk groups or key populations were emerging. Data show that in 1993, one individual was identified as having contracted HIV through injecting drugs. In 2002, the number of people living with HIV (PLHIV) from this group had increased to 116 and came from six provinces. In 2004, the number of HIV cases in this group accelerated so quickly that in only 2 years, it had reached 30% of the total 2682 cases of HIV/AIDS identified in 25 provinces.

The number of newly reported HIV infections increased almost four-fold between 2003 and 2004, although this may be associated with enhanced testing and counselling, improved diagnosis by medical personnel and enhanced reporting mechanisms, especially in Java, Bali and some other provinces outside these two islands. It also meant that the HIV epidemic in Indonesia had switched from being low level to being a concentrated epidemic with a prevalence above 5% among high-risk populations. The estimated number of PWIDs, in 2012, was approximately 60,000–80,000 and has remained unchanged since 2009. This figure, as estimated by a regression model for PWIDs, was consistent with that from the National Narcotics Board (Indonesia) and with anecdotal evidence suggesting a continuing trend in substitution of injected heroin for oral methamphetamines. This reduction may also be due to fewer individuals injecting drugs or a higher mortality rate among PWIDs [2]. The success in reducing HIV prevalence among PWIDs is attributed to the efforts made towards harm reduction through increased distribution of sterile needles and the administration of methadone since the early 2000s. Another contributing factor is the substitution of heroin for amphetamine-type stimulants and oral buprenorphine but further research to confirm the effectiveness of this intervention is required.

Although transmission through injecting drug use in PWIDs using heroin displayed a downward trend in 2014, since 2008, individuals now use other injectable drugs: heroin (putaw), suboxon, and others. If we do not contain the use of these drugs, the risk is an increasing number of cases of HIV/AIDS in the future [3]. A general decrease in needle sharing has been noted as indicated in the 2015 IBBS. High-risk behaviours in PWIDs are defined as sharing needles on the last day of injecting and sharing needles in the past week. There is a noticeable decrease in the proportion of PWIDs who share needles, from 15% to 13.3% in 2007 and 2011, respectively, and to 10% in 2015. In addition, there has been a decrease in the proportion of those who shared needles

in the past week from 12.2 % to 8.5% and 5.8% in 2007, 2011 and 2015, respectively. Therefore, it seems that the country’s harm-reduction programme is already on the right track.

To address injecting drug use and to prevent HIV transmission through sharing needles, the Minister of Health has issued national regulation Nomor 55 year 2015 on harm reduction among PWIDs, which revised the MH decree Nomor 567/Menkes/SK/VIII/ 2006. This policy aims to reduce HIV/AIDS morbidity and mortality caused by injecting drug use and improve the quality of life for PLHIVs.

The following four services are considered effective in preventing HIV transmission in this harm-reduction programme: (1) sterile needle-exchange programme to prevent the sharing of needles and syringes; (2) methadone-maintenance therapy or opiate-drug substitution therapy, especially heroin with methadone; (3) drug addiction treatment; and (4) medical treatment for PWIDs and an HIV-positive partner. Such services can be provided at *Puskesmas* (community health centres), hospitals and prisons/detention centres. In the 2015 IBBS, 10 years after the harm-reduction policy was initiated, the HIV prevalence in PLHIVs had fallen from 52.4% in 2007 to 28.8% in 2015 [4].

Transmission through same-sex relationships

MSM are the second highest group affected by HIV after heterosexuals (22%; Table 1). When looking at the data on reported cases of HIV infections from 2010 to 2015, it appears that among the three highest risk groups for HIV transmission,

Table 1. The number of reported cases of HIV infections by risk factor (2010–2015)

Risk factors	Year					
	2010	2011	2012	2013	2014	2015
People who inject drugs	2780	3299	2461	2675	1794	802
Heterosexuals	6623	10668	10825	14792	12511	9873
MSM	506	1040	1514	3287	3858	4241
Others	4362	6549	6903	8499	6075	4677
Unknown	7320	–	–	–	–	–

MSM: men who have sex with men. Source: HIV/AIDS Progress Report for Quarter 4, 2015, the Directorate General of Disease Prevention and Control, Ministry of Health [1].

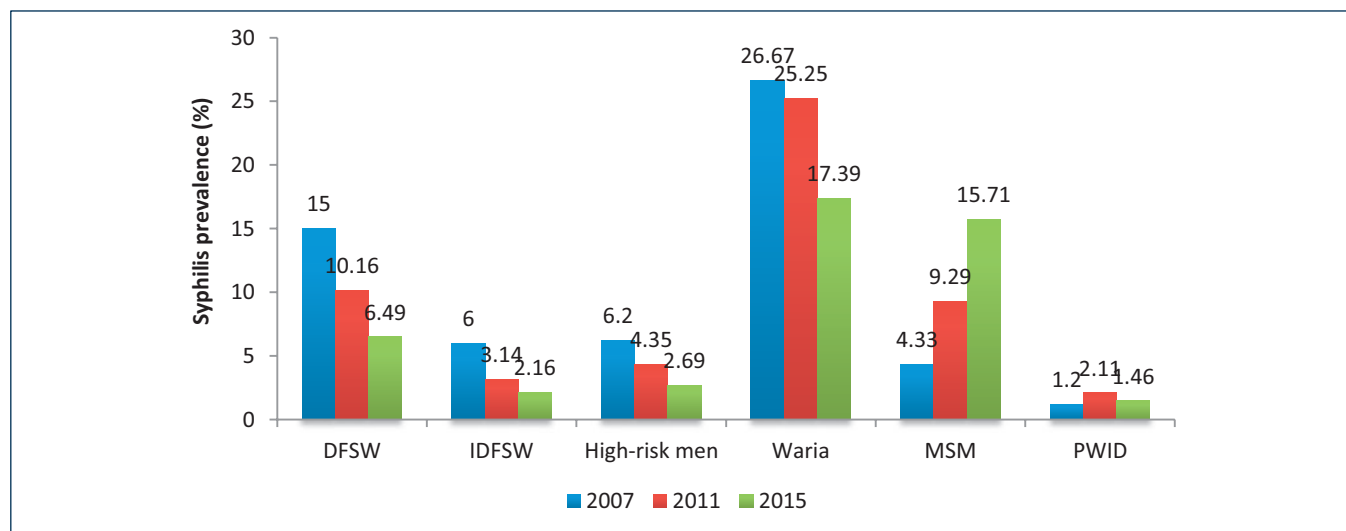


Figure 2. Syphilis prevalence overtime in key populations. DFSW: direct female sex workers, IDFSW: indirect female sex workers; MSM: men who have sex with men; PWID: people who inject drugs. Source: Integrated Biological and Behavioral Survey 2015, Ministry of Health Indonesia [4]

MSM show an upward trend. This is different from PWIDs who have displayed a yearly decrease. Infection rates among heterosexuals began to show a decline in 2014 (Table 1).

The MSM population is the group with the highest level of knowledge of HIV/AIDS according to the 2015 IBBS, in which 65.6% of respondents could correctly answer five basic questions on HIV that have been used as a Millennium Development Goal indicator. This figure was higher compared to the reporting periods in 2007 (40.5%), and 2011 (25.5%).

Among the *Waria*, the level of comprehensive knowledge has remained unchanged between the IBBS reports in 2007 and 2015, and approximately 35% of respondents correctly answered five basic questions. This means that providing an information programme for the purpose of behaviour change still needs to be continued and strengthened in this population.

HIV and sexually transmitted infections (STIs)

The 2015 IBBS has shown a decrease in the prevalence of syphilis among the *Waria* population, direct and indirect FSWs and high-risk men (Figure 2). In contrast, an upward trend is ongoing in MSM from 4.3% and 9.3% in 2007 and 2011, respectively to 15.7% in 2015. In PWIDs the trend is still changing, from 1.2% in 2007 to 2.1% in 2011, although there was a slight decrease in the 2015 IBBS. Therefore, the control of infectious diseases must be accompanied by an increase in more regular condom use, and as previously discussed, condom coverage still needs to be improved.

In terms of health-seeking behaviour, an improvement has been seen in the past few years. Surveys in 2007 and 2011 among direct FSW who had experienced one STI symptom indicated that most people tried to self-medicate, while in the 2015 survey most have sought help at hospital/health centres. The same trend was seen among MSM, *Waria* and PWIDs. Among indirect FSWs and high-risk men, self-medication is still the most favoured course of action. Among PWIDs, when compared to 2011, the self-medication rate had decreased by 2015 while the number of those who sought medical help in health centres more than doubled from 18% to almost 39%, indicating an increase in awareness in this group.

The HIV epidemic in Papua

Indonesia has long been described as having a dual HIV epidemic: one concentrated in key populations nationally, and by 2013, a generalised epidemic in Papua and West Papua provinces with a

prevalence of 2.3% [5]. The national prevalence among the adult population estimated by Asian Epidemic Modelling was at 0.3% in 2013 [6]. There are variations among districts and provinces, such as levels as high as 55% among PWIDs in Jakarta and 56% among FSW in the central highlands of Papua. These provinces have experienced low-level generalised epidemics, boosted by heterosexual transmission, although, in the last 7 years, rates of high-risk sexual behaviours such as paid sex, sequential sex and pre-sex drinking have declined. In 2013 approximately 12.7% of married men and 3.6% of married women reported having sex out of wedlock in the previous year, a decrease when compared to figures from 2006 of 18.2% and 5.3%, respectively [5].

The 2006 IBBS shows that sexual behaviour patterns in Papua are relevant in terms of HIV transmission [7]. On average sexual debut occurs at 19.5 years for men and 18.8 years for women. However, the proportion of young people in Papua aged 14–24 years who started having sex before age 15 years was significantly higher than among older people in the age groups 25–39 and 40–49 years. This trend is more dominant among females than men. Early sexual relationships often come with poor reproductive health knowledge, including that of STIs and HIV, especially among girls. In other words, these girls do not understand the risks they face, or have awareness of the options available for their protection. A lack of information increases their vulnerability to infection [7].

In addition to an early sexual debut, high-risk sexual practices in Papua continue to be problematic, for example multiple sex partners, an active sex life and sequential sex, where a female has sex sequentially with several men [8]. These practices in urban areas are believed to be connected to money, alcohol or drugs: a man who does not have enough money to buy the services of a commercial sex worker or to meet his girlfriend's expectations may meet up with other men to buy sexual services collectively. These men then negotiate the fee with a woman who will have sequential sex with all of them [8].

The main challenges for combating HIV in Papua remain issues such as communication, geographical location and infrastructure, especially transportation and healthcare infrastructure, poverty, alcohol excess and promiscuity supported by the local culture, as well as sexual and gender-based violence.

It is also generally difficult to find condoms available in the region and according to the 2006 IBBS findings, only 17% of respondents reported being able to easily obtain condoms. Pharmacies and

clinics are their main sources; however, these sources are often difficult to access because of large distances to travel.

The HIV epidemic in Indonesia and the healthcare sector response

By the end of 2015 the coverage of HIV services had expanded to all provinces as well as priority districts and cities, and was delivered by the government and supported by communities and NGOs for outreach activities. There has been a considerable expansion in the number of HIV counselling and testing (HCT), STI testing, treatment and harm-reduction sites. Antiretroviral therapy (ART) delivery has been scaled up and is increasingly decentralised at the primary healthcare level in high-burden areas. Integrated TB/HIV testing and treatment are more widely available and there has been a huge expansion in the coverage and implementation of prevention of mother-to-child transmission (PMTCT) strategies, particularly through its integration into maternal and child health (MCH) services, thereby resulting in more than 298,050 pregnant women aged 15 years and above testing for HIV and receiving their result in 2014, as compared to 100,718 in the previous year [1].

In 2014, the Ministry of Health released an estimate of the number of PLHIVs, which then stood at 600,000. This number was much lower than the previous estimate of 700,000 people in 2012. From a total of 200,618 individuals who had tested positive, 63,066 were on ART in December 2015.

Antiretroviral therapy in Indonesia: history, challenges, barriers and opportunities

At the beginning of the epidemic, the major barrier to treatment access was cost. The Pelita Ilmu Foundation workshop recorded 25 PLHIVs in Jakarta who received antiretroviral treatment (ART) in 1998. Each month these needed Rp6–7 million/person to buy their medication. However, with the help of benefactors, a PLHIV now pays only an average of Rp1.5 million/month for medication.

Today the government provides first-line and several second-line antiretrovirals for free. It is important to note that the journey to provide free ARVs did not only involve the government, but also civil society and the medical community who have run successful advocacy campaigns. Co-operation between several government agencies has proven that strong leadership could bring positive results. In 1997, thanks to the advocacy of the public and the medical community, the National Agency of Drug and Food Control, (NA-DFC) and the Ministry of Health issued an official letter to the Directorate General of Customs, Ministry of Commerce. It informed the Directorate General of Customs and Excise that NA-DFC was expecting a shipment of AIDS drugs from abroad that was addressed to Pokdisus AIDS and that these should be released immediately without having to go through a trial by the Head of NA-DFC. In reality, PT Pos Indonesia delivered the drugs directly to Pokdisus AIDS. In the same year, the Minister of Finance also issued a decree to exempt ARVs from import duties.

Thanks to good co-ordination and support from the NA-DFC chairperson, a number of generic anti-HIV drugs from India such as zidovudine (ZDV), didanosine, lamivudine (3TC), saquinavir and ritonavir have been available in Indonesia since 1997 although most PLHIVs could not afford them. Subsequently, in 2002, the Director General of Pharmaceutical Ministry of Health included ZDV, 3TC and nevirapine in the National Essential Drugs List for all type A and type B hospitals. The Government, among others, with the support from the Global Fund, has continued to expand treatment access. The Minister of Health in March 2003 stated that the government would subsidise generic ARVs up to Rp200,000/month for each PLHIV. In July of the same year, the Global Fund began its programme to support 100 PLHIVs in five

provinces. By the end of 2003 approximately 1100 PLHIVs were projected to have access to ARVs [9]. In the same year Kimia Farma, a state-owned pharmaceutical company began producing generic ARVs. This important step towards self-reliance was unfortunately halted due to political issues. Currently, Indonesia offers quite a limited choice of ARVs as compared to many other developed countries. However, the availability of three drugs in one pill (tenofovir, lamivudine and efavirenz) facilitates the task for doctors. Since 2006, the government is committed to providing free ARVs to PLHIVs with only 10% supported by a non-governmental budget.

The latest ART data in Indonesia have shown that the number of people with HIV/AIDS who have received ARVs up to December 2015 was at 63,066. Most of them (75.6%) were using the original first-line regimen, 21.2% used substitutes and 3.3% had switched regimen. This number was far below the total number of people who tested positive for HIV/AIDS, e.g. 268,185, and is less than 25% especially when compared to the estimate in September 2014 of 600,000 individuals living with HIV.

To close the gap in the linkage to care, an important strategy is the 2015–2019 National Strategic Action Plan, which aims to intensify and accelerate the Strategic Use of ARVs (SUFA) that was launched by the Ministry of Health in mid-2013. It aims to increase HIV testing and ART coverage and retention, aimed particularly at pregnant women, HIV/TB co-infected patients, HIV/hepatitis B and C co-infected patients, FSWs, PWIDs, MSM, and serodiscordant couples with inconsistent condom use. SUFA was implemented in 13 districts/cities and expanded gradually in 2014 to cover a total of 75 districts/cities [10].

In 2013, the Ministry of Health issued the following regulations to address the challenges of the HIV epidemic [1]:

- The Health Minister Regulation No. 21 in 2013 on HIV/AIDS control. The scope of the policy includes health promotion, prevention, diagnosis, treatment and rehabilitation for the individual, family and community.
- The Health Minister Circular Letter Nomor 129 year 2013 on the implementation of the HIV/AIDS and STI control. The letter requested the Head Provincial Office, District Health Office and Director of Hospitals in Indonesia to strengthen health promotion and prevention, expand HIV counselling and testing and care-support-treatment.
- The Health Minister Regulation NO. 51 in 2013 on the guidelines for PMTCT. The guidance aims to develop and implement PMTCT activities, develop human resources at central and regional levels, mobilise and increase the commitment from stakeholders and communities.

Other policy strengthening actions that support the response include the launch of the National Social Security System which includes a financial package as part of HIV service costs for opportunistic infections and STI treatment for PLHIVs, and the roll-out of gender-sensitive planning and budgeting at the national and regional levels. At the local level, however, gaps remain in local policies and/or regulations that support access to services for affected key populations and PLHIV.

From Millennium Development Goals (MDG) to Sustainable Development Goals (SDG): some lessons learned

Millennium Development Goals: what have we achieved?

Based on the latest MDG report, the percentage of the population aged 15–24 years who have comprehensive knowledge about

HIV/AIDS is still as low as 21%. This indicates that the group is still highly vulnerable to HIV infection. One type of intervention is the provision of information focused on HIV/AIDS through the campaign *Aku Bangga Aku Tahu* (ABAT), which literally means 'I'm Proud I Know'. This campaign is a strategy to promote responsible sexual behaviour and information on modes of HIV transmission. This campaign started simultaneously in all provinces of Indonesia in 2012 and involves the government and businesses, and is aimed in particular at young people. Other efforts include attempts to decrease the number of cases and improve people's access to treatment and integrated HIV/AIDS services. Up until December 2015, there were 2221 HIV counselling and testing (HCT) sites and 528 care, support and treatment (CST) sites in existence. Furthermore, 261 sites for PMTCT were integrated into maternal and child health services. As a result, there is an increasing number of pregnant women (100,718) aged 15 years and over who have tested and have received their test results in the past 12 months, as compared to 42,276 the previous year [1].

In addition, there are already 1643 service places for the management of STIs and 90 places for the methadone maintenance programme. Another achievement is the issue of various local regulations strengthening initiatives to prevent HIV/AIDS, such as 10 Regional Regulation (Perda) Provincial levels; one Regulation of the Governor and 13 Perda Regency/City. The number of local regulations is expected to continue to increase in the future [11].

Decentralisation of ART distribution

In the past few years the Ministry of Health has developed a system to decentralise ARV provision by strengthening supply chain management. As a result more accurate data about the adequacy of ARV supplies and reporting have been obtained. In the implementation of decentralisation, the Provincial Health Office is responsible for the reporting of ART management and distribution in the region. Decentralised ARV distribution started in 2011 and has gradually expanded. Up to 2015, there were 23 provinces that had implemented this policy [11].

What needs to be improved?

Some of the differences between the MDGs and the 2030 Agenda (SDGs) include: Zero Goals, Universal Goals, More Comprehensive Goals, Inclusive Goal Setting, Differentiate Hunger from Poverty, Financing, Peace, Data Revolution and Education Quality [11].

Regarding health, the SDG has Goal 3 for all health issues, efforts to ensure the well-being and promote fulfilment of the right to health for all people without exception. Target 3.3 reads: 'By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases'.

In addition, the following goals and targets in SDGs are relevant to the plan to end the AIDS epidemic by 2030, those are goals number 1–5, 8, 10, 11, 16 and 17. It is important to see these as a united effort to ensure that nobody is left behind [12].

Conclusions

HIV has attracted worldwide attention as a continuing global epidemic. Developed countries have allocated huge amounts of funds for prevention, including in Indonesia. Treatment for HIV has been secured by government funding, while HIV prevention and management may need further support from other sources. When sexually transmitted HIV began to spread, massive free condom distribution programmes were carried out. With an increasing number of PWIDs, HIV prevention has also focused on the use of sterile needles and the provision of free needle exchange and outreach programmes.

In terms of HIV management, Indonesia is still facing a number of challenges [10]. First, to improve HIV treatment coverage, which requires extra effort, the following strategies are recommended:

- Increasing the number of people who have access to HIV testing and treatment through routine tests
- Ensuring the benefit of such interventions by starting early treatment
- Strengthening referral systems between field officers
- Improving the quality of HIV testing and treatment
- Providing support to those who do not have access to ARVs
- Supporting those who are on ARVs and the necessary laboratory monitoring, particularly with regard to CD4 T cell count and HIV viral load testing.

Secondly, to establish and strengthen networks among self-help groups in key affected populations. These need encouragement to advocate for comprehensive services and to improve and update their members' knowledge about HIV. Various types of research, protocols and treatment guidelines, including for STIs, and prevention programmes are ongoing. It would be very unfortunate if the research findings and documentation established were not used to promote health-seeking behaviours. Thirdly, consistent condom use should be encouraged to avoid STIs, as well as healthy sexual behaviour to further support the impact of ARVs.

In conclusion tangible success has been achieved in the past few years in terms of the HIV epidemic in Indonesia with the implementation of policies aimed at its prevention and treatment; however, there remain many challenges that need to be overcome to reach the 2030 MDGs.

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Disclaimer

FW, TN and MA are staff members of the World Health Organization. The authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the World Health Organization.

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A success story: identified gaps and the way forward for low HIV prevalence in Bangladesh

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Abstract

Bangladesh remains a low prevalence country for HIV infection. In this article we attempt to address the reasons for the present success in this country and the challenges lying ahead to minimise the spread of HIV in the future.

Keywords: Bangladesh, HIV, migration

Epidemiology

The first case of HIV infection in Bangladesh was reported in a migrant in 1989 [1]. The country is considered to have a low prevalence for HIV as it is estimated that only around 9600 (8400–11,000) individuals are living with HIV [2]. There were 3674 individuals reported to have HIV up until December 2015 [2]. The prevalence in the general population remains low and below 0.1%. In key populations such as people who inject drugs (PWIDs) and in men who have sex with men (MSM), prevalence is at 5% and 1%, respectively [2,3].

Testing for HIV

Currently the National AIDS/STD Programme (NASP) offers voluntary counselling and testing (VCT) through 12 drop-in-centres (DICs), which are hospital-based. Non-governmental organisations (NGOs) and community-based organisations (CBOs) offer HIV testing to key populations (KPs) with the support from the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM).

Routine HIV testing is not offered to pregnant women due to the low HIV prevalence in the general population. Among patients with tuberculosis (TB), HIV testing is performed in those with multi-drug resistant (MDR) TB and treatment failure. HIV testing is not offered in sexual health clinics. Sentinel surveillance was performed among PWIDs, MSM and female sex workers (FSW) until 2011.

HIV prevention programmes are carried out by NGOs and CBOs with external funding. This is understood to be one of the key factors behind the low HIV prevalence in Bangladesh.

Of those diagnosed HIV, 50% of infected persons are migrants who have been deported from the Gulf countries. Couples counselling and testing are not performed owing to the stigma attached to HIV [4]. There is no HIV testing policy for returning migrants or structured HIV prevention programme in place for this population.

The Bandhu Social Welfare Society, a community organisation, offers an intervention and testing programme for MSM and transgender populations. Among MSM, 1% are HIV positive. It is estimated that around 40,000–150,000 MSM live in Bangladesh. Only around 40,000 of them will be covered by the GFATM and among them, only 35% will have tested for HIV. Fifty percent of MSM are married to female partners and no interventions or testing

programmes are in place for their spouses owing to the stigmatisation of HIV.

There are around 10,000 transgender individuals in the country and 1% of them are HIV positive. Not all are routinely offered HIV testing.

MUKTHI, a CBO, has been running an intervention programme for PWIDs since 1998 and offers HIV testing. There is an estimated HIV prevalence of around 5% and a poor uptake of HIV testing in this population. In this context, behavioural intervention should be coupled with HIV testing.

Community-based organisations are involved in intervention programmes such as condom distribution for FSWs. Testing and STI services are not widely accessible for this population. NGOs are increasingly seeing that resources are decreasing in terms of prevention, testing and STI services. Interventions such as mobile VCT centres should be studied and implemented for this population to promote HIV testing.

Linkage to care and treatment

There are 3674 persons diagnosed with HIV infection in Bangladesh. Among them, 2536 are linked to care [2]. NASP works closely with the Ashar Alo Society (AAS), a CBO facilitating the linkage to antiretroviral therapy (ART) care and clinical follow-up. Around 2000 HIV-positive individuals are registered with this society and approximately 1200 have initiated ART.

Treatment is provided by the government. The programme was initiated in 2005 by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR-B) with its own funding for a small number of patients. The GFATM-supported ART programme started in 2008 and has been supported by the government since 2012.

Patients with a CD4 T cell count below 500 cells/mm³ are initiated on ART, with a new threshold of CD4 T cell count above 500 cells/mm³ to be implemented by this end of this year. First- and second-line ART regimens are available. Two centres in the country have the facilities for HIV viral load testing but due to lack of resources, it is not performed for treatment monitoring. There are eight centres for CD4 T cell measurements but the majority of them are affected by a chronic lack of resources and cannot sustain regular testing (Figure 1).

Patients who are sick with opportunistic infections (OIs) and drug toxicities are admitted to infectious diseases hospitals (IDH), ICDDR-B and medical college hospitals. Few facilities are available for the diagnosis of OIs and co-infections but dedicated doctors and nursing staff are available in these in-patient wards.

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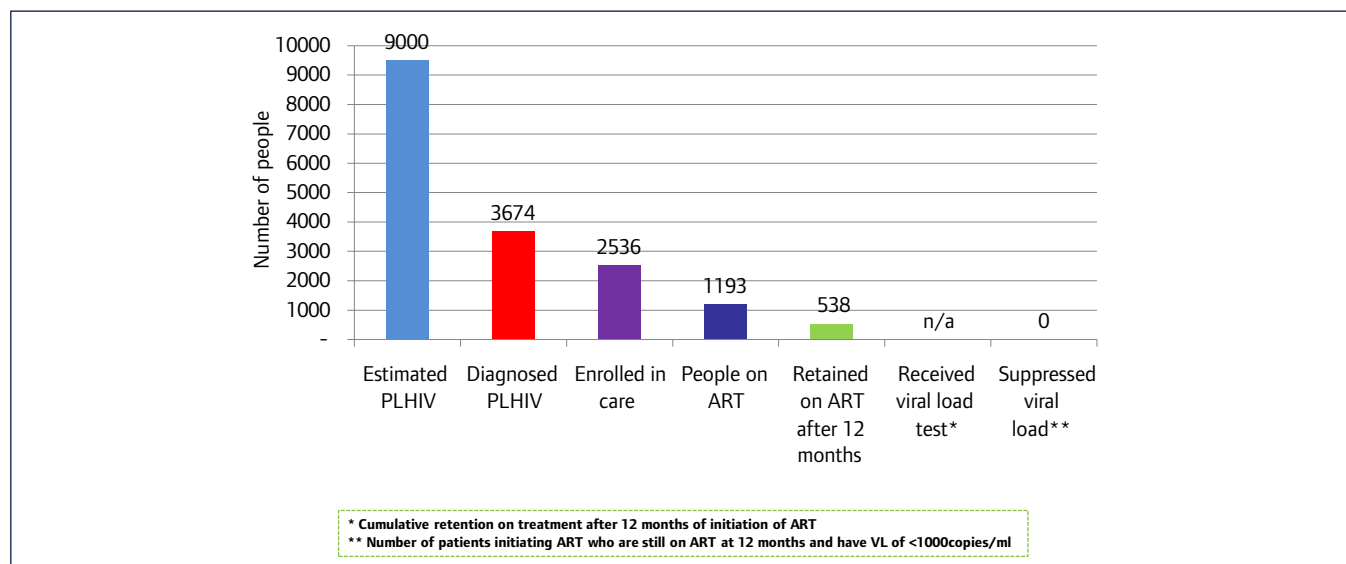


Figure 1. Cascade for HIV treatment and care in Bangladesh. PLHIV: people living with HIV

Support services for comorbidities like malignancy, hypertension and diabetes remain insufficient. Specialty hospitals/doctors also tend to discriminate against HIV-positive patients. Hepatitis C (HCV) co-infection occurs in 35% of HIV-positive PWIDs.

In terms of paediatric HIV, there are 200 diagnosed children with limited dedicated treatment facilities available for them.

Tuberculosis

Patients with tuberculosis are not routinely tested for HIV. Testing is performed only in the case of MDR-TB, extrapulmonary TB, treatment failure and for contacts of TB patients. Isoniazid preventive therapy is not implemented; however, Genexpert testing is available.

Twenty-three districts, in which 80% of all HIV patients live, including KPs, are now recommending HIV testing for all TB patients as of the first quarter of 2016. Sentinel surveillance of HIV in TB patients has not been implemented since 2004.

Antiretroviral regimens (ARVs)

Tenofovir, emtricitabine and efavirenz (TDF/FTC/EFV) have been used as first-line treatment since 2012. Zidovudine, lamivudine and nevirapine (ZDV/3TC/NVP) were used previously and patients are continuing on this regimen. Ritonavir-boosted lopinavir (LPV/r) and atazanavir (ATV/r) are available as second-line treatment.

Gaps identified and the way forward

HIV testing for key populations remains inadequate. User-friendly services should be offered to increase the uptake of testing. The success in terms of the low prevalence in Bangladesh is in part due to the early response soon after the detection of the first case. With the help of CBOs, NGOs and international funding, various intervention programmes have helped to contain the HIV infection rate. However, sustained funding is needed for NGOs to maintain the present success. Some are closing down their services due to a lack of funding and this is expected to impact on the containment of HIV. Sustainable models should therefore be developed by the NASP.

Several interventions are needed in terms of testing/diagnosis, treatment, its monitoring and patient follow-up as well as healthcare training. HIV counselling and testing should be offered to all patients with TB, STI attendees and spouses of HIV-infected patients after

initial counselling. The current WHO Treatment Guidelines are not implemented locally as not all patients are initiated on ART as recommended. However, it is expected that implementing WHO 2016 Guidelines would be cost effective for the country in the long run owing to the small number of diagnosed individuals. HIV load for treatment monitoring should also be made available and implemented with the necessary resources. Sustainable linkage and follow-up models are needed to prevent onward HIV transmission and the emergence of a drug-resistant virus.

Resources for the diagnosis of opportunistic infections are inadequate in all hospitals and should be allocated in a sustainable way to prevent morbidity and mortality. Non-communicable diseases (NCD) care should be strengthened in this population. Furthermore, doctors in charge of HIV patients require ongoing training programmes to keep up with medical developments.

We believe that investing in prevention yields significant savings on treatment costs and will make the HIV programme affordable over the long term. If ART is scaled up without expanding and optimising prevention coverage of KPs, new infections will continue to increase, treatment costs will spiral upwards, and the programme will become financially unsustainable. As a result, to significantly reduce new HIV infections we recommend the following:

- Scaling up both prevention among KPs and ART coverage among PLHIV by using strategic approaches;
- Addressing HIV-TB co-infection, focusing on migrants;
- Implementing integrated interventions for clients of sex workers and PWIDs;
- Providing information to vulnerable adolescents through existing services.

A separate consultation is also needed between NASP and the International Organization for Migration to draft an effective and robust policy on HIV for migrants. Educational programmes and systematic VCT should be offered to all migrants, who amount to approximately 5 million individuals per year. A cost-effectiveness analysis of the frequency of HIV testing in KPs and migrants should also be carried out.

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Epidemiology of HIV, programmatic progress and gaps in last 10 years in Nepal

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Abstract

Background and objectives: Nepal has made progress with the control of HIV infection in recent years. There have been changes in epidemiology, programme interventions in different population groups, and changes in policies over the last 10 years, particularly in diagnosis and treatment. Therefore, this review was conducted to identify the effectiveness of different interventions/policies in different sub-populations at risk, targeted towards epidemiology and treatment outcomes for those with HIV infection in Nepal.

Methods: This review was prepared based on a review of published and unpublished documents from the Nepalese HIV infection control programme, published articles in different journals, different survey reports including integrated bio-behavioural surveillance (IBBS) survey reports.

Results: The prevalence of HIV infection among adults in 2014 was 0.20% with a progressive decreasing trend from 2005. The prevalence of HIV infection among injecting drug users (51.7% in 2005 and 6.4% in 2015 in Kathmandu valley) was relatively high in all years as compared to other risk groups. HIV infection prevalence among women attending antenatal clinics was higher in the year 2006 (0.25%) but there was a decreasing trend in the following years to 2015, when prevalence was 0.077%. Although different interventions were conducted to cover key populations at risk, the coverage in some risk population was very low. HIV testing status among the general population was very low (7.5% among males and 2.9% among females) in 2011. Only one-third of HIV-infected individuals were on ART in 2015, although this proportion has increased since 2005. The share of domestic budget among the total expenditure on HIV control program is below 15%.

Conclusions: There is the need for implementation of control programmes more efficiently and effectively with expanding geographical and population coverage. Surveillance systems should be strengthened to get up-to-date information for evidence-based planning and developing strategies. The domestic budget for HIV control programme should be increased to improve their sustainability.

Keywords: epidemiology, HIV infection, control programmes, gaps, Nepal

Introduction

The first case of HIV was reported in Nepal in 1988, thereafter, there was a trend for increasing numbers of infections being recorded among specific groups of the population and in the low-risk general population for 20 years. However, numbers appear to be decreasing [1]. Although Nepal's HIV control programme has achieved some progress in reducing the incidence of HIV infections, it needs to be implemented effectively and efficiently to achieve the targets set.

HIV in Nepal is characterised as a concentrated epidemic in specific groups of the population, for example people who inject drugs (PWID), men who have sex with men (MSM) and female sex workers (FSW) [2]. Male migrants who work particularly in India, where migrant labourers often visit female sex workers, are considered a bridging population that transfers infections to the general population. Forty-eight per cent of Nepal's population are between the age of 15 and 49 years, and are vulnerable for acquiring and transmitting HIV infection [2].

There is a commitment to ending the HIV epidemic globally by 2030 [3]. The global health sector strategy on HIV 2016–2021 has proposed the vision of zero new infections, zero new deaths and zero HIV-related discrimination in a world where people living with HIV are able to live long and healthy lives [4].

Nepal's National HIV/AIDS Strategy 2011–2016 has adopted strengthening of the Second Generation Surveillance (SGS) system [5]. However, before starting SGS, it is important to know the status and progress made in HIV/AIDS control so as to further strengthen control programmes based on identified intervention gaps.

The epidemiology of HIV in Nepal has changed due to evolutions in policies over the last 10 years, particularly in diagnosis and treatment, and the various efforts to control HIV in the different population groups. Therefore, this review aims to improve knowledge on the effectiveness of the interventions/policies in different sub-populations at risk.

Methodology

This article was prepared by reviewing published and unpublished documents from the Nepalese HIV control programme, published journal articles and various survey reports including IBBS surveys. Medline and PubMed were searched for key peer-reviewed literature published up to April 2016 for information on key affected populations as well as the general population.

Furthermore, the strategic information unit of the National Centre for AIDS and STD Control (NCASC) was consulted for routine programme data on epidemiology and services on the current status of HIV infections in different risk populations and control efforts of the programme in Nepal.

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Apart from epidemiological data sources, financial investments in HIV control interventions were also collected and analysed from secondary sources.

Results

Estimation of the number of HIV infections in 2015 has shown a trend of decreasing HIV incidence since 2008. The estimated prevalence of HIV in 2015 was 0.2%, and had progressively decreased since 2005. The estimated prevalence of HIV has shown a reverted trend as targeted by the programme but reported

number of HIV cases did not show such trend. Reports from ART centres show cumulative deaths due to HIV had reached 2204 in Nepal up to 2015 (Table 1).

The prevalence of HIV infection among PWID (51.7% in 2005 and 6.4% in 2015) was relatively high in all years compared with other risk groups in the population. In addition, prevalence amongst PWID was higher in the Kathmandu valley than in the Pokhara and Terai districts. However, for FSW, HIV prevalence was 2% in 2015 in the Kathmandu valley but a cross-sectional survey in Pokhara in 2011 and 22 Terai districts in 2012 showed prevalences of 1.2% and 1%, respectively, having remained almost constant over the years from 2006.

Similarly, prevalence of HIV among migrants was relatively higher in the mid- and far-western regions in 2006 (2.8%) but had reduced to 0.6% by 2015. Prevalence of HIV among migrants in western districts constituted 1.1% in 2006, 1.4% in 2008, and 0.3% in 2015.

The prevalence of HIV infection among MSM varied from 1.7 to 14.4 in different years, and was 2.4% in 2015 (Table 2).

We assessed HIV prevalence among different population groups. Reported HIV prevalence among women attending antenatal clinics was higher in 2006 (0.25%), decreasing over the following years and was lowest in 2015 (0.08%). Among blood donors, HIV prevalence has been consistently below 0.5% and was 0.03% in 2014 (Table 3).

The number of people having an HIV test nationally was highest in 2013 and lowest in 2008. Percentage HIV positivity among all those who tested decreased over the years. Among 164,051 tested in service centres, 0.9% were HIV positive in 2015. The cumulative number of individuals treated with antiretroviral drugs was 11,089 in 2015 through 61 ART antiretroviral treatment sites. ART was first given to 50 individuals in Nepal in 2004. Of those who tested

Table 1. Trends of HIV infections in Nepal (2005–2015)

Year	Reported number of HIV cases ^a	Estimated number of HIV infections ^b	Estimated prevalence ^b	Reported cumulative deaths due to HIV on ART ^a
2005	1234	46,532	0.34	–
2006	2681	47,242	0.34	–
2007	2037	47,520	0.33	175
2008	2387	47,262	0.32	349
2009	2110	46,569	0.31	540
2010	2015	45,691	0.29	720
2011	2060	44,681	0.27	980
2012	2433	43,463	0.26	1305
2013	2426	42,082	0.24	1613
2014	1907	40,713	0.22	1931
2015	1610	39,397	0.20	2204

^a NCASC Routine Programme data, 2015

^b National HIV Infection Estimation, 2015

Table 2. Prevalence of HIV infections among key risk groups of populations

MARP	Location	2005	2006	2007	2008	2009	2010	2011	2012	2015
FSWs	Kathmandu		1.4		2.2			1.7		2.0
	Pokhara		2.0		3.0			1.2		
	22 Terai districts		1.5			2.3			1.0	
Client of FSW (Truckers)	Terai districts		1.0			0.0				
PWID	Kathmandu	51.7		34.8	23.02	20.7		6.3		6.4
	Pokhara	21.7		6.8		3.4		4.6		2.8
	Eastern Terai	31.6		17.1		8.1			8.0	8.3
	Western Terai	11.7		11.0		8.0			5.0	
MSM	Kathmandu			3.3	1.7	3.8		14.4	3.8	2.4
MSW	Kathmandu			2.9		5.2				
Migrants	Mid far west	1.9	2.8		0.8		1.8		1.4	0.6
	Western districts		1.1		1.4				1.1	0.3
Spouses of migrants	Far west districts				3.3		0.8			

FSW: female sex worker; MARP: most at-risk population; MSM: men who have sex with men; MSW: male sex workers; PWID: people who inject drugs; Source: IBBS survey reports, 2005–2015 [8–23, 32]

Table 3. HIV prevalence in the general population of Nepal

Risk group of population	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Women in antenatal clinics ^a	0.25%	0.18%	0.20%	0.20%	0.15%	0.14%	0.14%	0.10%	0.10%	0.08%
Blood donors ^b	0.40%	0.19%	0.09%	0.09%	0.08%	0.08%	0.15%	0.05%	0.03%	–

^a NCASC Routine Programme data, 2015

^b GDDBS data, 2006–2014; [6,7]

Table 4. National HIV testing and treatment (2005–2015)

Year	Number tested ^a	HIV positive among tested ^a (%)	New cases on ART ^a (%)	Number of ART sites ^a	Number of HTC sites ^b
2005	7654	1234 (16.1)	122 (9.9)	3	
2006	16,890	2681 (15.9)	350 (13.1)	9	
2007	28,103	2037 (7.2)	811 (39.8)	17	106
2008	53,309	2387 (4.5)	1203 (50.4)	23	137
2009	62,672	2110 (3.4)	1014 (48.1)	25	179
2010	106,325	2015 (1.9)	1317 (65.4)	35	
2011	95,501	2060 (2.2)	1616 (78.4)	36	214
2012	120,450	2433 (2.0)	1236 (50.8)	39	225
2013	139,566	2426 (1.7)	1147 (47.3)	44	245
2014	116,439	1907 (1.6)	1541 (80.8)	53	263
2015	164,051	1610 (0.9)	682 (42.4)	61	263

HTC: HIV testing and counselling

^a NCASC Routine Programme data, 2015^b Health System Reports, 2010, 2013**Table 5.** HIV control intervention activities among key populations (cumulative as of July 2015)

Interventions	Population covered ^a				
	PWID	MSM	MLM/ spouses	FSWs	Clients of FSW
Reached through BCC	13,478	40,230	119,863	33,138	88,706
Distribution of condoms	606,171	2,385,565	1,340,286	4,712,296	2,805,769
HIV testing and counselling	9777	6674	40,623	10,006	12,957
STI diagnosis and treatment	1110	1909	11,793	10,104	627
Provided needle/syringe	1,663,213	–	–	–	–
Enrolled on methadone	314	–	–	–	–
Enrolled on buprenorphine	381	–	–	–	–
Distribution of lubricants	–	853,396	–	–	–

BCC: behaviour change communication; PWID: people who inject drugs; MLM: male labour migrants; MSM: men who have sex with men; FSW: female sex workers

^a NCASC Routine Programme data, 2015

positive in 2005, 9.9% started ART. However, by 2014, this proportion had gradually increased to 80.8% although this decreased to 42.4% in 2015. The number of sites offering ART increased from three sites (in three districts) in 2005 to 61 sites (in 55 districts) by 2015 (Table 4).

Although different interventions have been conducted to cover key populations at risk from HIV, the coverage in some at-risk populations has been very low. Less than 15% of migrants have been reached by prevention programmes. Similarly, HIV testing and counselling, STI diagnosis and treatment coverage have also been low as compared to vulnerable populations, based on their exposure due to migration, intravenous drug use, MSM, FSW and the national estimates of people living with HIV which is around 39,397 (Table 5).

The Nepal Demographic and Health Survey 2011 revealed that the proportions of young men and women with knowledge of HIV prevention was slightly reduced compared to 2006. Approximately 4% of males had multiple sexual partners. HIV testing status among the general population was very low (among males: 7.5%; and among females: 2.9%). The percentage of male and female sex workers using condoms was 93.1% and 82.6%, respectively. In 2015, 86% of MSM used condoms and 96% of PWIDs used safe injecting practices. Early infant diagnosis of HIV was increased

satisfactorily in 2015 to 16% compared to previous years; however, only one-third of HIV patients were receiving ART in 2015 although this was an increase on the years since 2005 (Table 6).

Between 2005 and 2015, various plans, policies and strategies have been formulated:

- National HIV Strategy 2006–2011;
- National HIV and AIDS Action Plan 2008–2011;
- National HIV and AIDS Strategy 2011–2016;
- National Blood Transfusion and Safety Policy, 2006;
- National guideline on Antiretroviral (ARV) therapy 2005.

In addition, various guidelines were developed and came into practice:

- National guideline on paediatric HIV and AIDS 2006;
- National guidelines on management of blood transfusion services in Nepal 2008;
- National AIDS and STI Policy, 2011;
- National HIV AIDS Strategy, 2006–2011;
- National HIV and AIDS Action Plan, 2008–2011;
- National HIV and AIDS Strategy, 2011–2016;
- National blood transfusion and safety policy, 2006;
- National guideline on Antiretroviral (ARV) therapy 2005;
- National guideline on paediatric HIV and AIDS 2006;
- National guidelines for HIV testing and counselling, 2011;

- National guidelines on management of blood transfusion services in Nepal 2014;
- National consolidated guidelines for treating and preventing HIV in Nepal, 2014;
- National guidelines on case management of sexually transmitted infections – 2014;
- Prevention of mother-to-child transmission of HIV in Nepal, standard operating procedures – 2012;
- National guidelines for early infant diagnosis – 2012;

The share of the domestic budget for total expenditure on HIV control programmes is very low: 0.8% in 2007 [23]; 1.3% in 2009 [2]; 2.0% in 2010 [24]; and 13.3% in 2014 [21]. Most of HIV control programmes were financed from foreign support including one-third of funds that came from the Global Fund.

Discussion

Nepal has made progress in HIV control programmes in recent years but reduction of the number of HIV infections is not as expected. The reported number of HIV/AIDS cases and recent estimations

Table 6. Status of Nepal's AIDS response indicators

Indicators	2010	Values				References
		2012	2013	2014	2015	
Young people: knowledge about HIV prevention	Male=43.6%; Female=27.6%	–	–	–	Male=33.9%; Female=25.8%	[8,9]
Multiple sexual partners	–	–	–	–	Male=3.8%	[8]
Condom use during higher risk-sex	–	–	–	–	Male=26.5%	[8]
HIV testing among the general population	–	–	–	–	Male=7.5%; Female=2.9%	[8]
Sex workers: prevention programmes	MSW=93.3%; FSW=60%	MSW=93.3%; FSW=60%	MSW=79.3%; FSW=60%	–	–	[10–12]
Sex workers: condom use	MSW=37.8%; FSW=75.0%	MSW=37.8%; FSW=82.6%	MSW=90.4%; FSW=82.6%	–	MSW=93.1%; FSW=82.6%	[10–13]
Sex workers: HIV testing	MSW=65.2%; FSW=32.4%	MSW=65.2%; FSW=54.6%	MSW=58.5%; FSW=54.6%	–	MSW=67.8%; FSW=56.0%	[10–13]
MSM: prevention programmes	77.3%	77.25%	64.0%	–	–	[14–16]
MSM: condom use	75.3%	75.25%	91.4%	–	86.0%	[14,16]
MSM: HIV testing	42%	42%	42%	–	43.8%	[14,16]
PWIDs: prevention programmes (number of syringes distributed per PWID annually by needle and syringe Programmes)	–	71.4%	34.9%	36%	–	Save The Children Nepal and United Nations Office on Drugs and Crime, 2011
PWIDs: condom use	50.8%	46.5%	46.5%	–	52.5%	[17–19]
PWIDs: safe injecting practices	99.1%	95.3%	95.3%	–	96.0%	[17–19]
PWIDs: HIV testing	21.5%	21.4%	21.4%	–	27.9%	[17–19]
Prevention of mother-to-child transmission (PMTCT)	3.3%	134 (12.2%)	142 (20.9%)	162 (32.53%)	–	[20]
Early infant diagnosis	–	22 (2.4%)	21 (3.1%)	32(6.4%)	16%	[1,2,21,22]
MTCT rate (modelled)	–	39.7%	35.6%	35.7%	35.0%	Estimation and projection package (EPP) 2011, 2015
HIV treatment: ART	19.0%	23.7%	21.8%	26.5%	35.0%	[1,2,21,22]
HIV treatment survival after 12 months on antiretroviral therapy	90.6%	82.5%	85.7%	83.9%	83.7%	NCASC; ART Cohort report-2015

in 2015, showed an almost constant trend over the years. Although there was progress in indicators set in the Millennium Development Goals, it seems that the 90-90-90 target set in 2014 by the Joint United Nations Programme on HIV/AIDS [25] and partners, in which 90% of people living with HIV know their HIV status, 90% of people who know their status receive treatment, and 90% of people on treatment have suppressed viral load by 2020, may not be achieved.

IBBS surveys revealed that HIV prevalence among FSW is not changing. FSW are considered the key drivers of HIV transmission in Nepal [26]. Women are at high risk of becoming HIV positive due to biological vulnerabilities, low socio-economic status, dominant sexual practices of males and epidemiological factors [27] and they are also more vulnerable to transmitting HIV [28].

The prevalence of HIV among PWID is still relatively high compared to other risk population groups, but it has been reduced significantly over the years. Among PWID, 96% used safe injecting practices and condom use was almost 53% only [1], both of these practices may have also attributed to a reduction in incidence of HIV among PWID. Therefore, drug abuse should be reduced as well as focusing on harm reduction, rehabilitation and re-integration, with further emphasis on preventing non-injecting drug users from becoming PWID. Further, expanded interventions are essential to control HIV among PWIDs.

Incidence of HIV in MSM and MSW populations is not reducing predictably. Therefore, comprehensive HIV prevention activities should be implemented among MSM and MSW to ensure a reduction.

There is decreasing trend of HIV/AIDS among migrants. Risk behaviour among migrants includes unprotected sex with multiple partners and sex workers and is promoted by substance abuse, loneliness, separation from families, peer pressure, long working hours and poor living conditions. Negligence about good sexual health and lack of comprehensive knowledge about HIV among male migrants are major obstacles that have exacerbated the disease prevalence [29]. Once home, migrants also have extramarital sex in their villages and do not see any reasons for using condoms with village women [30]. Literacy and awareness about HIV is a key measure to decrease the prevalence of the disease among migrants.

HIV prevalence among pregnant women attending antenatal care clinics, and who represent the general population, was 7 per 10,000. Similarly, prevalence of HIV among blood donors was 0.15%; however, data on other groups within the general population is not available. Therefore, the National HIV AIDS Strategy 2011–2016 focusing on linkages and integration of the HIV/AIDS control programme with other services such as HIV testing and counselling, TB, HIV, PMTCT, antenatal care, safe

motherhood, family planning, etc. should be explored and strengthened to assure comprehensive management of patients and future sustainability [5].

The cumulative number of HIV patients treated with antiretroviral drugs was 11,089 in 2015, which constitutes only 35% of the total population of people living with HIV. The number of people receiving treatment has been increasing year on year. In Nepal, HIV treatment initiation occurs at district health facilities and ART sites are also fairly limited in numbers. This inadequate decentralisation of care limits access to HIV treatment in rural villages. Interrupted procurement and supply of antiretroviral drugs and commodities for early diagnosis has also been reported [31]. Early initiation of ART in discordant couples for the reduction of HIV transmission to the uninfected sexual partner is important.

Analysis of programme coverage indicators revealed that knowledge on HIV prevention, condom use during high-risk sex, and HIV testing in the general population are very poor [8]. This suggests that HIV control programmes should also focus on the general population in addition to those most at-risk. Although coverage of prevention programmes among the most at-risk populations (MARPS) is satisfactory, HIV test uptake is very low among these populations. A comprehensive programme for the most at-risk populations should be expanded to increase geographical coverage. Greater focus on condom promotion, STI management and partner treatment should be promoted.

HIV policies, plans and strategies have been developed to address the HIV response in Nepal. Those strategies also cover most of the interventions to control HIV among at-risk populations. However, there are the questions of implementation of strategies, inadequate geographical and population coverage, and security of a sufficient budget. The budget allocation indicates that there is less than a 15% [2,21,23,24] share from the domestic budget, which raises the question of the sustainability of the intervention programmes.

There is a lack of adequate surveillance data to provide sufficient evidence on programme success. IBBS were also conducted irregularly with less geographical coverage of risk populations. Therefore, a continuous capacity-building process needs to be institutionalised for making monitoring and evaluation an ongoing activity at all levels. The monitoring and evaluation systems need to be integrated with the national health management information system, therefore a phase-wise approach needs to be initiated. A policy guideline also needs to be adopted for rational implementation of the spirit of public-private partnership (PPP) at every level, from prevention to care of HIV/AIDS.

The programmatic gaps identified that need to be addressed are as follows:

- (a) HIV testing and counselling (HTC) centres with other relevant health services should be established and expanded. Access to services such as STI, TB, HIV, PMTCT, antenatal care, Safe motherhood and family planning, should be expanded through integration with other reproductive and primary healthcare services to assure comprehensive management of patients and future sustainability.
- (b) There is a need for expansion of the ART services, but prior to that there is need for scaling up the case-detection capacity through various strategies such as awareness raising, HTC expansion, incentive provision, and stigma and discrimination reduction. Scaling up of ART should be done on the basis of needs assessment and geographical MARP mapping data.

- (c) There is a need to significantly expand prevention and develop better strategies to reach larger numbers of Nepali migrants working in India.
- (d) Drug abuse should be reduced including harm reduction, rehabilitation and re-integration with emphasis on preventing non-injecting drug-users from becoming PWID.
- (e) A system should be established to enable MARPs and PLHIV to address the issue of stigma and discrimination and other violations of their rights through continuous scale up of awareness programmes with greater involvement of PLHIV, community based organisations, NGOs, faith groups and media personnel. Comprehensive programmes for MARPs should be expanded to increase geographical coverage. Greater focus on condom promotion, STI management and partner treatment should be promoted.
- (f) A continuous capacity-building process needs to be institutionalised for making monitoring and evaluation an ongoing activity at all levels. The monitoring and evaluation system needs to be integrated with the national health management information system.
- (g) The domestic budget for HIV prevention activities should be increased for sustainability of the programme.
- (h) There is a strong need of harmonisation and co-ordination of programmes implemented by various partners. A central data bank should be in place at NCASC and data should be shared based on the national monitoring and evaluation guideline.

Conclusions

Nepal has maintained a constant incidence of HIV infection with little progress in reducing the number of cases of HIV infection. Therefore, there is a need for implementation of more efficient and effective control programmes, with expanded geographical and population coverage. The surveillance system should be strengthened to get up-to-date information for evidence-based planning and developing strategies. The domestic budget for the HIV/AIDS control programme should be increased for sustainability of the intervention programmes.

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Author contributions

PG with the cooperation of TP, RP MRB and NS designed the concept for analysis and manuscript designing; PG and MRB with support from TP, BBR, MC and KB collected the available data and analysed; PG with support from MRB drafted the initial versions of the manuscript with analysed information as above and circulated to other co-authors for their review and inputs; all authors reviewed the final manuscript and agreed to the analysis, gaps and final draft for submission to the journal for publication.

Disclaimer

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Factors associated with clinic escorts in peer-led HIV prevention interventions for men who have sex with men (MSM) in Sri Lanka

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Abstract

Background: Sri Lanka has recently completed an HIV prevention project for most-at-risk populations (MARPs) under the Global Fund. The intervention includes delivery of a HIV prevention package (HPP) to men who have sex with men (MSM) that includes provision of: (1) knowledge about sexually transmitted infections (STI); (2) HIV knowledge; (3) MSM-tailored leaflets; (4) condom/dildo demonstration; (5) provision of condoms; and (6) clinic escorts. MSM who received services 1–5 in the HPP are defined as ‘reached’. The final step is to escort the reached MSM to an STI clinic, and they are then defined as ‘escorted’. This HPP was delivered to MSM through peer educators (PE) scattered in four highly populated districts in the country. Each PE has contact with another 15 peers forming a peer group (PG). However, in this model, a significant number of MSM do not take up the escorting step of the HPP. Therefore, the purpose of this paper is to analyse the factors associated with clinic escorts among MSM peers in the HIV prevention project.

Methods: All the MSM peers (699 MSM) registered and retained during the project period had been reached in 2013, 2014 and 2015 and were chosen from the web-based Monitoring and Evaluation information management system (MEIMS) for analysis. The sample was divided into two groups based on escort status (escorted peers vs non-escorted peers). Variables were compared between the two groups for the hypothesis of difference to identify significant factors associated with clinic escorts.

Results: The study sample (699 MSM) represented four districts: Galle (37%), Colombo (35%), Gampaha (14%) and Kalutara (14%). Escort status depended on the district ($P < 0.001$), age group of MSM ($P = 0.008$), level of education ($P = 0.007$) and urban/rural status ($P < 0.001$), duration of MSM behaviour ($P = 0.018$), experience of an HIV test during previous 12 months ($P = 0.050$), and recent receptive anal sex ($P = 0.050$).

Conclusions: Older MSM (>25 years), MSM living in urban and semi-urban areas, *Nachchi* MSM (effeminate males), MSM with receptive behaviours as well as less-educated MSM were less likely to be escorted and needed some extra effort to improve escort rate among MSM. In addition, performance of PEs, field supervisors and coordinators was observed to be a major factor in improving escort rate.

Keywords: Men who have sex with men, MSM, HIV, escorts, peer education, Sri Lanka

Introduction

Sri Lanka has been categorised as a country with a low-level HIV epidemic because HIV prevalence has not consistently exceeded 5% in any of the high-risk sub-populations such as female sex workers (FSW), men who have sex with men (MSM), beach boys (BB) and people who inject drugs (PWID) [1]. However, at the end of 2015, a cumulative total of 2308 HIV-positive persons have been reported to the National STD/AIDS Control Programme (NSACP), Ministry of Health, Sri Lanka [2]. During 2015, the highest number of total cases (235) in a year was reported to the NSACP. In general, an estimated 10.5 new infections occur per week, while only approximately 4.5 new cases are reported to the NSACP per week [2].

Analysis of reported HIV cases to the NSACP during the last 5 years (2011–2015), showed that heterosexual and homosexual behaviour was the main mode of HIV transmission in the country. However, the relative proportion of HIV transmission through heterosexual behaviour reduced from 74% (2011) to 54% (2015) while the proportion of transmission via male-to-male sex increased from 20% (2011) to 41% (2016). Mother-to-child transmission remained between 3% and 7% over the same period. Injecting drug use as a mode of transmission was reported in less than 2.5% of cases. However, transmission via blood and blood products has

not been identified as a method of transmission since 2004 [2]. Therefore, the most relevant risk behaviours and key populations being considered are those associated with the main routes of HIV transmission, such as unprotected vaginal and anal sex and the use of non-sterile needles or materials [3].

Sri Lanka has identified different high-risk sub-populations for HIV prevention interventions such as FSW, MSM, beach boys (BB; a group of men who associate with tourists as guides or ‘animators’, and provide entertainment including sexual services, the majority of whom are bisexuals), clients of sex workers and people who inject drugs (PWID) as most-at-risk populations (MARPs) [4]. The mapping and size estimation study carried out in 2013 provided estimates of 14,132 FSW, 7551 MSM, 1314 BBs, and 17,459 PWID in the country [5]. HIV prevalence estimation carried out in the Integrated Biological and Behavioural Survey (IBBS) showed that HIV prevalence among FSW and MSM was 0.8% and 0.9%, respectively while among PWID and BB, the HIV prevalence was 0% [6].

Sri Lanka has completed a 5-year HIV activity plan under the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) at the end of 2015, which is currently being continued, with another 3-year activity plan under the GFATM New Funding Model (2016–2018) [2]. Currently, the Family Planning Association, as the non-governmental principal recipient of the GFATM grant, is carrying out HIV prevention interventions for the most-at-risk populations (FSWs, MSM, BBs and PWIDs). The main intervention is through a peer-group model. Under this model, peer educators, who are persons identified as having knowledge and leadership

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Table 1. Number and percentage of MSM escorted from 2013 to 2015 in comparison to number of MSM reached with the HIV prevention package (HPP)

Year	Number of MSM Reached with HPP	Number of MSM escorted to STI clinics	Percentage of MSM escorted
2013	2127	496	23%
2014	2980	969	33%
2015	3638	1416	39%

Source: Annual Progress Report of the Primary Recipient 2 (PR2), Global Fund HIV Prevention Project (Round 09 Grant-Phase 2).

qualities, are trained and a monthly allowance is given to maintain a peer group of about 15 peers under the guidance of field supervisors and coordinators for different MARPs. This article examines the MSM peer model, which provides an HIV prevention package (HPP) for MSM that includes six items:

1. Provision of knowledge about sexually transmitted infections (STIs);
2. Provision of HIV knowledge;
3. Provision of MSM-tailored leaflets;
4. Condom/dildo demonstration;
5. Provision of condoms;
6. Escorting of peers to an STI clinic for HIV testing.

Peers are referred to as 'reached' if the first five services are delivered (reached peers). Once the reached peers are escorted to an STI clinic they are referred as 'escorted' (escorted peers) [7].

Although escorting of MSM to the government STI clinic for HIV testing and counselling is one of the important aspects of the HIV prevention package, the percentage of MSM escorted remained at 23–39% during the past 3 years (2013–2015). Table 1 describes the number and percentage of MSM escorted from 2013 to 2015 against the number of MSM reached with HPP [8].

The details of MSM who have been reached with the HPP regularly but who failed to be escorted during 3 consecutive years needs to be examined to take programmatic decisions.

The purpose of this paper is to analyse the MSM peer cohort in order to examine the factors associated with clinic escorts (HIV testing) in peer-led HIV prevention interventions for MSM in Sri Lanka.

Methods

Web-based monitoring and evaluation information management systems (MEIMS) maintained at the Family Planning Association of Sri Lanka (FPA) are the main databases for the peer-led project and which have capacity for data filtering and export. Data for the MEIMS are entered by the project coordinators of the community-based organisation (CBO), at the district level, using peer calendars of the peer educator. A peer calendar is a sheet of paper with peer names, peer visit date and the service code of the HIV prevention package. These data are secondarily verified by the monitoring and evaluation staff at the project for quality. Furthermore, re-checking of peer calendars and on-site data verifications are carried out by the monitoring and evaluation staff to improve data quality.

The MEIMS maintain the peer cohorts from the time of peer registration with follow up data entry during the project period (from 2013 to end 2015). The system is updated by the CBOs at the district level two times per month. The clinic escort data are verified and entered in the MEIMS at the Family Planning Association using the escort slips issued by the respective STI clinics [7].

Details of a total of 714 MSM peers (including peer educators) registered and retained in the service during the project period (reached during 3 consecutive years 2013–2015) were filtered and exported to an Excel work sheet and then to SPSS v20 for further analysis. Fifteen records were excluded from the analysis due to data quality issues. A total of 699 MSM were considered in the final analysis.

All the categorical data were analysed to generate frequency and percentages while numerical data were analysed to present central tendency and dispersion. Both categorical and numerical variables were compared between the group of 'reached but not escorted peers' and the group of 'reached and escorted peers' (escorted to the STI clinic for HIV testing) to identify whether the variables are dependent at the level of significance of $P=0.05$ using chi-square tests for categorical data and using Mann–Whitney U tests for numerical data.

Table 2. Distribution of sample characteristics

Variable	Levels	Frequency	Percentage	Cumulative percentage
District	Colombo	247	35%	35%
	Gampaha	98	14%	49%
	Kalutara	97	14%	63%
	Galle	257	37%	100%
	Total	699	100%	
Location	Urban	304	43%	43%
	Semi-urban	184	26%	70%
	Rural	211	30%	100%
	Total	699	100%	
Age	<25	335	48%	48%
	≥25	364	52%	100%
	Total	699	100%	
Marital status	Married	125	18%	18%
	Unmarried	514	74%	92%
	Living together	32	5%	96%
	Divorced	17	2%	99%
	Widow	9	1%	100%
	Total	697	100%	
Level of school education	Up to Grade 8	98	14%	14%
	Up to GCE O/L	361	52%	66%
	Up to GCE A/L	205	29%	95%
	Above GCE A/L	32	5%	100%
	Total	696	100%	
Duration in MSM behaviour (No. of years)	<5	173	25%	25%
	5–10 years	252	36%	61%
	10–20 years	228	33%	94%
	>20 years	43	6%	100%
	Total	696	100%	

Results

Background information

A total of 699 MSM peers retained in the service during the project period (2013–2015) were filtered for the analysis and sample characteristics are shown in Table 2.

Comparison of district-level programme implementation

District variation among the non-escorted group and the escorted group are significant (dependent) and showing high escort rates in Galle and Gampaha (Table 3).

Comparison of socio-demographic factors among non-escorted group and escorted groups

Young MSM (<25 years) were more likely to have an HIV test during the project ($P<0.05$). Escort status also depended on the level of education ($P<0.05$). Those who were educated up to GCE/O' level and above were more likely to be escorted for an HIV test. Rural-living MSM (79%) were also more likely to be escorted for an HIV test than semi-urban (74%) and urban MSM (69%). However, marital status and escort status were independent variables and no significant difference was observed. *Nachchi* MSM (effeminate males) were less likely to be escorted for HIV testing than the other MSM. This may be due to high levels of stigma from society towards *Nachchi* people (Table 4).

Comparison of behavioural factors between the non-escorted group and the escorted group

Duration of MSM behaviour, uptake of an HIV test during the previous 12 months (at the time of registration) and number of occasions of receptive anal sex during the previous week were dependent on escort status. MSM with a short duration of risk behaviour (<5 years) and relatively longer duration of risk behaviours (>20 years) were more likely to be escorted for an HIV test. In addition, those with a high frequency of insertive sexual encounters (>10 per week) were also more likely to be escorted. Experience of an HIV test during the previous 12 months seemed to reduce the willingness to be escorted (Table 5).

Discussion

The peer-led HIV prevention intervention project paid a monthly allowance and trained peer educators (PE). Each PE had to maintain contact with another 15 MSM and provide the components of the HPP. There were 248 MSM peer groups scattered in four major districts (Colombo, Gampaha, Kalutara and Galle) covering 3638 MSM. Analysis and comparison of the non-escorted and escorted groups for the hypothesis of difference shows that young MSM (<25 years), rural MSM, educated MSM as well as MSM with shorter duration of risk behaviours (<5 years) and longer duration of risk behaviours (>20 years) were more likely to be escorted to an STI clinic for an HIV test. However, for older MSM (≥ 25 years) and MSM living in urban and

Table 3. Comparison of district level programme implementation

Variable	Variable values	Non-escorted		Escorted		Total	Chi-squared test	Mann-Whitney U test
		N	%	N	%			
District	Galle	51	20%	206	80%	257	$\chi^2=23.118$ $P=0.000^*$	N/A
	Colombo	91	37%	156	63%	247		
	Gampaha	22	22%	76	78%	98		
	Kalutara	36	37%	61	63%	97		
Subtotal		200	29%	499	71%	699		

* Statistically significant at 99% confidence interval.

semi-urban areas as well as less educated MSM, there needs to be more emphasis about the importance of attending the STI clinic for HIV testing and different innovative strategies need to be adopted to increase the rate of HIV testing among those groups. One of the important findings is that *Nachchi* MSM, which includes male sex workers (MSW), are less likely to be escorted for HIV testing than other MSM. The reason may be due to the high stigma prevalent in the society towards *Nachchi* MSM and MSW. Therefore, this warrants special strategies for *Nachchi* people (especially MSW) to be escorted for an HIV test. MSM with frequent insertive behaviours (>10 per week) are more likely to be escorted and attend for testing. This may be due to relatively less stigma among insertive partners. Experience of an HIV test during the previous 12 months seems to reduce the uptake of an HIV test. In addition, it has been observed that district variation of escort rates are also largely dependent on the district level implementation (CBO), performance of PE, field supervisors and coordinators who can overcome some of the difficulties found.

Table 4. Comparison of socio-demographic factors among non-escorted and escorted groups

Variable	Variable values	Non-escorted		Escorted		Total	Chi-squared test	Mann-Whitney U test
		N	%	N	%			
Age category	<25	80	24%	255	76%	335	$\chi^2=7.051$ $P=0.008^*$	$Z=-3.334$ $P=0.001^*$
	≥ 25	120	33%	244	67%	364		
	Subtotal	200	29%	499	71%	699		
Marital status	Ever married	46	30%	105	70%	151	$\chi^2=0.346$ $P=0.557$	N/A
	Other	153	28%	393	72%	546		
	Subtotal	199	29%	498	71%	697		
Level of education	Up to year 08	37	38%	61	62%	98	$\chi^2=12.098$ $P=0.007^*$	$Z=-0.222$ $P=0.824$
	Up to GCE O/L	84	23%	277	77%	361		
	Up to GCE A/L	70	34%	135	66%	205		
	Above GCE A/L	9	28%	23	72%	32		
	Subtotal	200	29%	496	71%	696		
MSM category	<i>Nachchi</i>	32	40%	48	60%	80	$\chi^2=7.536$ $P=0.057$	N/A
	MSM	125	26%	362	74%	487		
	MSW	3	20%	12	80%	15		
	MSM/Other	7	29%	17	71%	24		
	Subtotal	167	28%	439	72%	606		
Location	Rural	44	21%	167	79%	211	$\chi^2=15.928$ $P=0.000^*$	N/A
	Semi urban	46	25%	138	75%	184		
	Urban	110	36%	194	64%	304		
	Subtotal	200	29%	499	71%	699		

GCE: General Certificate of Education; O/L: Ordinary level; A/L: Advanced level; MSM=men who have sex with men.

* Statistically significant at 99% confidence interval.

Table 5. Comparison of behavioural factors between the non-escorted group and the escorted group

Variable	Variable values	Non-escorted		Escorted		Total	Chi-squared test	Mann-Whitney U test
		N	%	N	%			
Duration of MSM risk behaviour	<5 years	38	22%	135	78%	173	$\chi^2=10.126$ $P=0.018^*$	$Z=-2.741$ $P=0.006^*$
	5–10 years	69	27%	183	73%	252		
	10–20 years	82	36%	146	64%	228		
	>20 years	11	26%	32	74%	43		
	Subtotal	200	29%	496	71%	696		
Used condoms at last sex with male	No	138	27%	369	73%	507	$\chi^2=2.097$ $P=0.148$	N/A
	Yes	62	33%	127	67%	189		
	Subtotal	200	29%	496	71%	696		
Test for HIV during past 12 months?	No	172	28%	451	72%	623	$\chi^2=3.686$ $P=0.050^*$	N/A
	Yes	28	38%	45	62%	73		
	Subtotal	200	29%	496	71%	696		
Number of receptive anal sex during the last week	1–6	64	28%	162	72%	226	$\chi^2=5.351$ $P=0.069$	N/A
	7–10	34	40%	51	60%	85		
	More than 10	26	39%	40	61%	66		
	Subtotal	124	33%	253	67%	377		
Number of insertive anal sex during the last week	1–6	94	28%	244	72%	338	$\chi^2=5.952$ $P=0.050^*$	N/A
	7–10	42	34%	82	66%	124		
	More than 10	8	16%	43	84%	51		
	Subtotal	144	28%	369	72%	513		

* Statistically significant at 95% confidence interval.

Conclusion

Escort status of MSM is dependent on number of factors. Older MSM (≥ 25 years), MSM living in urban and semi-urban areas, *Nachchi* MSM (effeminate males), MSM with receptive behaviours as well as less educated MSM require more emphasis on the importance of attending for testing to improve escorting rates among MSM in the project. It has been observed that the variation in escort rates in different districts is also dependent on the ability of the PE, field supervisors and coordinators who can overcome factors affecting escorts.

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Conflict of interests

There are no conflicts of interest.

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Twenty-two years of HIV infection in Bhutan: epidemiological profile

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Abstract

Aims: To describe the HIV epidemiology in Bhutan.

Methods: Data from the database of people living with HIV infection in Bhutan, survey reports from the National STI and HIV/AIDS Control Programme from the Ministry of Health and published literature on HIV in Bhutan were reviewed.

Results: Bhutan continues to have a low HIV prevalence with only 470 cases reported by the end of 2015. However, there is a slow but steady recent increase in the number of cases. The main mode of transmission is unsafe heterosexual practice in the general population and is occurring mostly in urban and business districts. More than half of cases have been diagnosed in only three districts. Although the number of cases among key populations such as sex workers and intravenous drug users remains significantly low, the information available remains very limited. There is only scarce published literature on HIV in Bhutan and an absence of a strategic surveillance system. A high level of sexually transmitted infections and multiple sexual relationships represent the existing threats that may fuel a larger epidemic.

Conclusions: Bhutan has maintained a low HIV prevalence over the past two decades, which is reflected in the national response to HIV. However, with the presence of existing and newly emerging risk factors, this response needs to adapt continually. To ensure that HIV prevalence remains low, it is crucial to invest in a strategic information system to monitor rates of infections to guide the public health response.

Introduction

Bhutan is a small land-locked country located between China in the north and India in the south, with an estimated population of 733,643 of whom 53% are male and 48% female. The majority of the population continues to live in rural areas (65.5%) and is engaged in agriculture and livestock farming. Nearly 61% of the population is in the economically active age group of 15–64 years, while about 5% is over the age of 64. According to the Population and Housing Census of Bhutan, life expectancy stands at 66.2 years (65.65 for males and 66.85 for females) [1]. More than 90% of the population has access to primary healthcare delivered through a network of 31 hospitals, 178 basic health unit clinics and 654 outreach clinics [2]. The Constitution of Bhutan mandates the government to provide free access to basic health services [3].

For the past 30 years HIV infection has been one of the major causes of ill-health and mortality in the world. It is a global pandemic with over 37 million people estimated to be infected across the globe [4]. It has spared no country, not even the most isolated, such as Bhutan. The country has remained isolated from the outside world for the major part of its existence as a nation. It was only in 1971 that it became a member of the United Nations and started slowly opening its doors to the outside world. Television and the internet were introduced in 1999.

The first case of HIV infection was detected in 1993 with a total cumulative number of cases of 470 by the end of 2015 [5]. While the number of reported cases seems small compared to other countries in the region with very high burden of infection, it is still of public health concern given the small size of its population. Its two immediate neighbours are China, with an estimated 0.7 million people living with HIV (PLHIVs), and India with which Bhutan shares an open border with over 2.1 million PLHIVs [6].

Therefore, HIV was given the due attention it deserved with the establishment of the National STI and HIV/AIDS Control Programme in 1988, even before the first case of HIV was detected within its border [7].

The challenge for the country is to continue to maintain this low prevalence when considering the risks that come with modernisation and globalisation. In order to move forward with an HIV intervention programme, it needs to learn from good practices and the experience of other countries. However, this is a challenge as there is a lack of information regarding HIV infection in small countries with a low population similar to Bhutan. The majority of the evidence comes from highly populated countries with a large epidemic and, in most cases, concentrated in key populations.

This article is an attempt to review the current data on the epidemiology of HIV infection in Bhutan since the first case of HIV was diagnosed in 1993. It aims to analyse and describe the infection trend in the country with the hope that it will inform future interventions and serve as a reference for other similar types of countries.

Surveillance system and data sources

The National STI and HIV/AIDS Control Programme in Bhutan has an HIV case reporting system with unique identifiers that maintains a database of HIV cases. All PLHIVs are assigned a unique identifier by the Care, Support and Treatment Unit upon confirmation of their status. Information such as age, occupation, mode of transmission, diagnosis location and address are collected. This facilitates follow-up and patient tracking and forms the basis of a database that can be analysed over time to improve the understanding of the dynamics of HIV infection in the country. The information is collected on paper-based forms and then transferred onto Excel spreadsheets centrally where the information is collated. This programme also produces biannual reports to update and disseminate information on new recorded cases. There is, however, no sentinel surveillance programme currently in place

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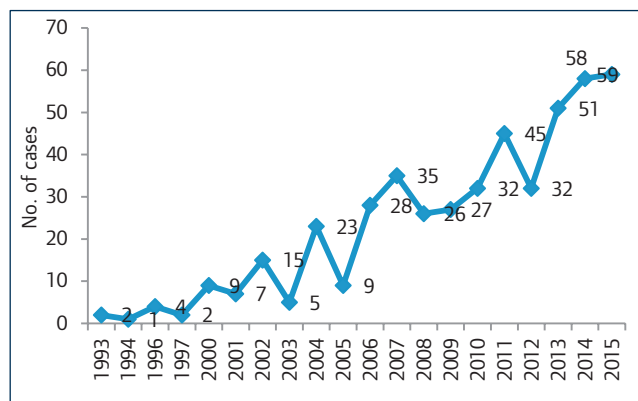


Figure 1. Detection of HIV by year in Bhutan

Table 1. Routine antenatal clinic (ANC) screening report

Antenatal Care (ANC)- Voluntary Counselling and Testing Report

Year	No. of ANC attendants tested	HIV-positive cases	Prevalence
2012	10,509	6	0.06%
2013	9339	8	0.09%
2014	11,281	1	0.01%

as, although initiated among antenatal clinic attendees, STI and TB patients, armed forces and migrant workers, it was discontinued in 2007 because of the low HIV prevalence and costs that then outweighed its potential benefits. For the purpose of this article the main source of data and information comes from the national PLHIV database in addition to other survey reports and published literature.

HIV case profile

The first case of HIV infection was reported in 1993 and since then there has been a slow but steady increase in the number of cases (Figure 1). From 2007 onwards there was a notable rise in the number of cases being detected and during the period 2013–2015 there was the greatest increase in the number of annual HIV cases ever reported. At the end of 2015, the total number of cases stands at 470, 80% of them reported between 2007 and 2015.

Estimated number of PLHIVs

There have been no population-based surveys performed in Bhutan to estimate the HIV prevalence among the general population. However, surveillance in antenatal clinics in 2006 has estimated the prevalence among pregnant mothers attending antenatal clinics at 0.02% [8]. Voluntary counselling and testing records maintained by the National Programme show a similar prevalence level at 0.01% among pregnant women attending antenatal clinics in 2014 (Table 1) [9]. UNAIDS has estimated that approximately 1100 (1000–2700) individuals are presently living with HIV in Bhutan [10].

Sex, age and occupations of PLHIV in Bhutan

There is no marked difference between sexes among the 470 reported cases (231 females and 239 males). However, the age at diagnosis is different, with females affected at a younger age as compared to the opposite sex. In the age range 20–22 years, the number of young females infected is almost twice that of

Table 2. The number of HIV infections by age and gender

Age group (years)	Female	Male	Total
<5	18	7	25
6–14	5	4	9
15–19	11	3	14
20–24	47	27	74
25–29	62	59	121
30–39	57	94	151
40–49	23	34	57
>50	8	11	19

Table 3. Adult occupation at the time of HIV diagnosis

Occupation	No. of cases	%
Civil servant	27	6%
Corporate employee	23	5%
Driver	43	10%
Farmers	87	20%
Housewives	106	24%
Private/Business	75	17%
Armed forces	34	8%
Religious body	10	2%
Sex worker	12	3%
Student/trainee	6	1%
Unemployed	13	3%

males. Over 70% of the total reported cases fall in the age range 20–39 years (Table 2).

The highest proportion of infections among adults was noted among female spouses, mostly detected through contact tracing (24%, $n=106$), farmers (20%, $n=87$), private entrepreneurs (17%, $n=75$), members of the armed services (8%, $n=34$) and transport workers (10%, $n=43$). A total of 12 cases have been reported to date among female sex workers (3% of total cases). Notably, although at a low level, the epidemic appears to be spread across all sections of Bhutanese society with no discernible socio-economic differentials (Table 3).

Place of diagnosis

HIV cases have been reported from 18 of Bhutan’s 20 districts. There is a clear geographical pattern with 70% of PLHIVs living in the capital, Thimphu, and two other border districts – Chukha and Samdrupjongkhar. The capital, which is the most populated district, alone accounts for 49% of cases detected so far. The other two districts share a border with India and both have frequent movement of adjacent populations between the two countries (Figure 2).

Mode of transmission

In terms of mode of transmission, 92% of infections are attributed to unsafe sex (all reported as heterosexual), 7% to vertical transmission and 1% to others means (Table 4). Only three reported cases so far have had a history of injecting drug use. None of the traditional most at-risk populations, for example people who inject drugs (PWIDs), commercial sex workers (CSWs) and men who have sex with men/transgender (MSM/TG) feature prominently in the epidemiological profile of HIV in Bhutan.

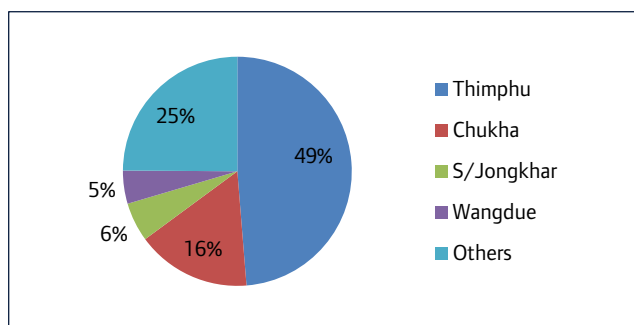


Figure 2. HIV cases reported by location in Bhutan

Table 4. Transmission routes for HIV infection

Transmission route	HIV cases (%)
Heterosexual sex	92
Vertical transmission	7
Others	1

The first mother-to-child transmission (MTCT) was reported in Bhutan in 2002. Routine HIV screening of pregnant women has been integrated into the mother and child clinic for over a decade now. So far, 32 cases of MTCT have been recorded within the PLHIV database. In 2014, a total of 11,281 pregnant women were tested for HIV [11]. In 2014, three cases of MTCT were reported and two cases in 2015. The National Programme has records of 69 children born to HIV-positive mothers who have been put on the prevention of mother-to-child transmission (PMTCT) programme. Of these 69 children, the HIV status of 17 of them is unknown, three died before being tested and 49 are confirmed HIV negative. Currently, early infant diagnosis facilities are not available in the country.

Discussion

The main aim of this article was to document the epidemiological profile of HIV infection in Bhutan. The HIV scenario in the country is still in its early stages, although there is a slow but steady upward trend of the number of cases reported annually. However, it might not necessarily reflect an increasing prevalence but is rather a function of the expansion of testing services. Bhutan has had HIV testing and counselling services in all its health facilities as well as at the level of the basic health units since the end of 2013. HIV prevalence among pregnant mothers as per the 2006 sentinel surveillance was 0.02%. With the general acceptance of the use of HIV prevalence among pregnant women as a proxy for that of the general population [12, 13], Bhutan indeed has a low prevalence, confirmed by the number of HIV infections among pregnant women based on routine VCT reports. The prevalence has been consistently low at 0.06%, 0.09% and 0.01% for 2012, 2013 and 2014, respectively (Table 1). The Routine Programme Data can be considered fairly reliable given that the coverage of antenatal clinics in the country is 81.7% for four visits [14]. Recently the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance has issued guidelines for the use of routine data from antenatal clinics for HIV surveillance [15].

However, with only approximately 47% ($n=470$) of reported cases from among the estimated 1100 PLHIVs living in the country, there is a gap in detection that needs to be addressed. UNAIDS estimates that more than half of the people currently living with HIV do not know their status [6]. The Annual Health Bulletin Report from the Ministry of Health shows that 45,808 HIV tests were performed

in the country in 2014 [16]. This means that 789 tests had to be performed to detect a single HIV case that year. (This figure does not include testing performed during health events and testing camps.) Testing strategies might need to be revised to focus on locations and groups that will give a maximum return to close the gap in diagnosis.

The epidemiological profiles of PLHIV suggest that HIV infection is not concentrated in any key population. The majority of infections occur in those in the young and economically productive age group of 20–39 years. Bhutan is also displaying the tendency for more females being affected at a younger age. Evidence from around the world points to the high vulnerability of young girls with reports of there being as high as eight times more infections in this population than their male peers in Africa [17–19]. The review of the epidemiological profile also reveals that there are geographical patterns of HIV with more than half of the cases being detected in three districts. While appreciating the principle of universal equity and access to healthcare services, the return from interventions can be optimised by focusing on these priority districts.

Although Bhutan has a low prevalence and none of the traditional high-risk group features at this point in time, there are vulnerabilities and risk factors that might fuel a larger HIV epidemic if appropriate interventions are not put into place. The risk factors, especially among the general population, are discussed below.

Multiple and concurrent sexual relationships

One major issue related to HIV risk in Bhutan across the entire population relates to multiple and concurrent sexual partnerships. The HIV/AIDS Behaviour Survey among the General Population in Bhutan, 2006 reported that extramarital sex and premarital sex were not uncommon. In fact the proportion of women engaged in extramarital or premarital sex was high compared to other countries in the region. The same survey reported that the average number of sex partners in the last six months among those who had extra- or premarital sex, was 2.7 [20]. Another more recent study in 2012 reported that 60% of men and 36% of women interviewed reported multiple sexual partners [20]. Furthermore, the knowledge level about HIV/AIDS is quite low in the general population with only 23.2% of individuals between the ages of 15 and 24 years reporting a comprehensive knowledge of the infection [14]. This partly explains the fact that 92% of the cases occur through heterosexual transmission. This high level of multiple and concurrent sexual partners coupled with a low knowledge about transmission routes can potentially fuel an explosive HIV epidemic if not addressed adequately.

High levels of sexually transmitted infections (STIs)

Another critical factor contributing to HIV vulnerability in Bhutan is the high levels of STIs. Rates are perceived to be increasing, although this may be a function of improvement in case reporting. Irrespective of the cause of this increase, the burden of STIs in 2014 (5814 cases) is nearly 12 times higher than that of reported HIV cases. A rapid assessment in 2012 in Thimphu showed that 20% of the male and 29% of the female population reported having an STI symptom in the past 12 months [21]. Interventions towards STI control will be a crucial input for reducing the HIV incidence in Bhutan.

Key populations

There is very limited information available about the traditional key population such as PWIDs, MSM/TG and CSW. A study among

drug users found only 11% of this group ($n=991$) to have ever injected and only 31 admitted to have injected in the past month [22]. There are no estimates for sex workers and MSM/TG in Bhutan. With no networks or formal establishment for sex work, there are no self-identified sex workers. Most of the sex happens as transactional sex. At the bordering towns some form of formal sex work exists with limited number of girls both from Bhutan and India operating through hotels and bars. A formative assessment was carried out to see the feasibility of conducting an integrated biological and behavioural survey (IBBS) among these key populations; however, given the small size and the hidden nature of these populations, an IBBS was not found feasible [23]. This has not deterred the government from initiating prevention programmes despite the limited evidence of HIV among these key populations in Bhutan. A pilot study for oral substitution is currently under way in the capital city for PWIDs. For MSM and TGs, a peer-based programme has been initiated alongside advocacy to create a supportive environment. Venue-based interventions for potential sex workers and their clients have been put into place in major towns. All of these initiatives support the creation of informal networks and help to gather strategic information.

Conclusions

The main aim of this article was to document the epidemiological profile of HIV in Bhutan as well as to describe the progress made. Based on the available data we can conclude that the country has a low HIV prevalence. A timely intervention by the Government and its partners has ensured the persistence of this low prevalence over the last two decades.

However, the increasing number of cases being detected remains a cause for concern. The present low prevalence does not mean that the status quo in the country will be maintained. Major HIV epidemics often transition from an initial low prevalence with a slow growth. Existing risk factors such as high STI rates and multiple sexual partners, if not rapidly addressed, can fuel a large HIV epidemic. Furthermore, the limited data and information available, especially among key populations at risk of acquiring HIV infection, is a major limitation. Building evidence would be key to inform the future strategic direction of the national response. Efforts to gather and use data to advocate, mobilise resources and design evidence-based programmes relevant to the country's specific needs and epidemiological pattern are of crucial importance to attempt to maintain the present low HIV prevalence status of the country.

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Disclaimer

SW is a staff member of the World Health Organization. The authors alone are responsible for the views expressed in this article and they do not necessarily represent the decisions, policy or views of the World Health Organization.

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