

## Can We End the Human Immunodeficiency Virus (HIV) in Singapore?

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Reports of clusters of patients with *Pneumocystis carinii* pneumonia and Kaposi's sarcoma were first reported among homosexual men in 1981 in the United States (US). That year, the New York Times published the first news article on this mysterious new disease and the Gay Men's Health Crisis (GMHC), the first acquired immune deficiency syndrome (AIDS) service organisation was founded. In 1982, additional cases among haemophiliacs, women, infants and blood recipients were reported. In 1983, a major outbreak of AIDS among both men and women in central Africa was reported. In 1984, the causative agent of AIDS was codiscovered by teams in the US and France, and the names 'human immunodeficiency virus (HIV)' and 'acquired immune deficiency syndrome (AIDS)' were adopted. The first cases of HIV infection were reported in Singapore in 1985.

In 1988, the first World AIDS Day was commemorated on 1 December, as an opportunity for people worldwide to unite in the fight against HIV, to show support for people living with HIV, and to commemorate those who have died from an AIDS-related illness. World AIDS Day was the first ever global health day. Also, in 1988 a small group of concerned citizens, banded together to set up Action for AIDS (AfA), a registered society dedicated to tackling AIDS and the accompanying ramifications, complications and consequences of HIV infection in Singapore. In a short space of time, a raft of programmes was rolled out; they covered public education on how HIV was and was not transmitted, outreach programmes to groups at greatest risk of contracting HIV infection that included safer sex campaigns and counselling of infected persons. The scope of programmes expanded to include anonymous HIV testing, improving access to anti-HIV medications, financial assistance for patients and their families, funding behavioural research projects, and advocacy for persons infected with and affected by HIV.

For those who were there at the start of the HIV epidemic, the memories of confusion, fear, anger, pain and death are still haunting, although they have become blurry and somewhat faded. Those were desperate times, but they were at the same time also inspiring and uplifting. In the 1990s,

community mobilisation and volunteerism around AIDS was at its height in Singapore as well as around the world. The nascent networks of activist gay men, sex workers, persons living with HIV, and their supporters, organised to seek answers and to come up with solutions to lessen the suffering in their communities. Community mobilisation, activism, close collaboration between scientists, physicians and affected communities, leadership and funding have been the hallmarks of the global response. The history and stories of the AIDS pandemic have been chronicled for posterity in numerous movies, plays, books and other media.

Today, HIV infection has become a chronic manageable disease, the result of their unprecedented collaborative efforts. Yet, while antiretroviral medications may have removed the prospect of almost certain death from AIDS for many who are infected, we have not yet been able to stop the transmission of HIV.

The World Health Organisation estimates that since the beginning of the epidemic, more than 70 million people have been infected with the HIV virus and about 35 million people have died of HIV. Globally, 36.7 million (30.8-42.9 million) people were living with HIV at the end of 2016. An estimated 0.8% (0.7%-0.9%) of adults aged 15 to 49 years worldwide are living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions.<sup>1</sup>

Over the past 10 years, more people infected with HIV have started to receive antiretroviral treatment. The rates of new HIV infections have slowed and the number of people dying of AIDS-related causes each year has decreased. These are major achievements, but are not good enough. New HIV infections are still occurring every day. In Singapore in 2017, 434 persons were diagnosed with HIV. Ninety-six percent of infections were contracted through sexual intercourse, 93% were males, 50% were homosexuals, 10% bisexuals and 36% heterosexuals; 41% of those diagnosed were already in the late stage of HIV infection. Disparities are seen between risk groups—more heterosexuals were diagnosed in late stages compared to homosexual/bisexuals, and more homosexuals/bisexuals (33%) had their HIV infection detected via voluntary screening compared to

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heterosexuals (8%).<sup>2</sup> We still have some way to go to making HIV a thing of the past.

HIV infection today is still an incurable disease that needs to be managed with daily medications, and regular medical consultations. Persons with HIV infection have also to contend with the effects of chronic inflammation that HIV infection inflicts on the body, the potential for drug toxicity and viral resistance, the omnipresent fear of stigmatisation by friends and discrimination by society, and practical issues like completing education, getting and retaining employment, getting health and life insurance, and developing personal and family relationships.

‘90-90-90’ is the Joint United Nations Programme on HIV and AIDS’ (UNAIDS’) strategy to curb the HIV epidemic based on expanded access to anti-HIV treatment. This treatment-as-prevention concept has been adopted as a matrix for countries to plan, monitor and evaluate their programmes.<sup>3</sup> When this 3-part target is achieved globally, it is estimated that at least 73% of all people living with HIV worldwide will be virally suppressed. Modelling exercises predict that achieving these targets by 2020 will enable the world to end AIDS as a major global health issue by 2030.

Singapore, while not a country with a high burden of HIV infection, has yet to achieve the 90-90-90 targets. In the most recent analysis (2015) of the HIV testing and treatment cascade (Dr Vernon Lee, oral presentation, 11<sup>th</sup> Singapore AIDS Conference on 8 December 2018), the estimated number of HIV infections was 7150 (95% CI 6900, 7350), of which 5164 had been diagnosed and notified, leaving a gap of 28% of infections undiagnosed. The number of new infections in 2015 was estimated to have been 350 (95% CI 280, 410). Compared to the analysis for 2013, improvements were recorded in all 3 measures—the proportion of infected persons diagnosed rose from 69% to 72%, the proportion of HIV-infected persons on treatment rose from 77% to 89%, and the proportion of treated persons virally-suppressed rose from 82% to 94%. Overall, it is estimated that 60% of persons living with HIV infection were virally-suppressed in 2015. To achieve better results, earlier and easier HIV testing, more complete linkage of persons testing positive to HIV to care, easier access to affordable treatment and follow-up, and a concerted effort to address HIV-related stigma are needed.

While acting to maximise the prevention effects of anti-HIV treatment, greater efforts are needed to scale up prevention programmes. Anti-HIV treatment alone will not lead to the end of the HIV epidemic. We need to increase resources to implement effective prevention methods that are evidence-based and proven.<sup>4,5,6</sup> The arsenal of HIV prevention strategies has expanded, from conventional methods of HIV testing and counselling, promotion of condoms, blood screening, education and behaviour

modification, harm reduction for injecting drug users, treatment of sexually-transmitted infections, to newer methods, for example medical male circumcision and the use of antiretroviral drugs for pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis (PEP).<sup>7</sup>

Ending AIDS as a public health threat by 2030 is feasible if high HIV burden cities fast-track their AIDS responses that include these new approaches. Since the World AIDS Day 2014 launch, mayors and other municipal leaders have joined forces with civil society representatives to action the Paris Declaration on Fast-Track Cities.<sup>8</sup> Many cities around the world have committed to the Fast-Track Cities approach.

Singapore is unique because it has a small population, high literacy and educational standards, an active community response, active clinician advocates, and a relatively well funded HIV programme. It is, therefore, in a good position to join the ranks of cities that can end the HIV epidemic by 2030.

It is to this end that a group of interested parties have got together to draft a ‘Community Blueprint to End HIV Transmission in Singapore’. Inspired by a similar blueprint produced by the Australian Federation of AIDS Organisations,<sup>9</sup> this project will involve the collective efforts and contributions of relevant stakeholders in the HIV/AIDS programme. It will review the current state of the epidemic in detail, paying attention to key populations affected by HIV, which in Singapore are men-who-have-sex-with-men (MSM), sex workers, heterosexual men with multiple partners, and injecting drug users. For each of these groups, we will review existing programmes, estimate gaps and additional resources needed to close those gaps. We will examine the group of late presenters to understand why they presented late and recommend ways to increase reach and effectiveness of educational and testing programmes. The blueprint will also look for ways to scale-up the use of PrEP for those at highest risk of HIV infection. Cities like Seattle, San Francisco, London and Sydney that have introduced PrEP programmes have registered significant declines in HIV notifications, and Singapore can do the same. To achieve all the above, we will need to estimate the workforce needed, both clinical as well as in the community. Existing programmes are understaffed, for example the AFA MSM programme has 2 fulltime staff, for a target audience size estimated to be somewhere between 140,000 to 300,000. Additional resources to fund manpower training and retention will be needed.

There are 2 other big pieces of the equation. One is to estimate by mathematical modelling the number of HIV infections that could be averted if we can improve prevention programmes by increasing condom use and scaling up PrEP. The other big piece is to calculate the savings for each of these infections averted, based on present-day costs

of treatment and care, on a per annum and lifetime basis. The blueprint will be a living document, to be updated and refreshed as more information becomes available. It is hoped that this community blueprint will form part of the national HIV strategy to end HIV in Singapore.

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