

The Human Immunodeficiency Virus (HIV) Epidemic in Singapore—Where Are We Now, and Can We “Get to Zero”?

Sophia Archuleta,¹MD, Joanne Tay,²MBBS, MPH, Arlene Chua,³MD, MSc

December 1, 2012 marked the global community's 25th observance of World Acquired Immune Deficiency Syndrome (AIDS) Day. The Joint United Nations Programme on human immunodeficiency virus (HIV)/AIDS (UNAIDS)'s World AIDS Day Report 2012 cited historic gains and laudable achievements towards ending the global AIDS epidemic.¹ HIV incidence fell by 50% in 25 low- and middle-income countries between 2001 and 2011—more than half of these were in sub-Saharan Africa where the majority of new HIV infections occur. In 14 countries, AIDS-related deaths declined by over 50% between 2005 and 2011.

In Singapore, a cumulative total of 5521 HIV-infected residents have been reported as of June 2012.² Although Singapore is considered to have a low level HIV epidemic,³ the annual number of newly diagnosed HIV cases has remained steady at between 440 to 465 cases each year over the last 4 years, with no significant declines seen.⁴ Articles in this HIV-themed issue of the *Annals* present important findings and highlight current challenges in the areas of HIV prevention, diagnosis and management.

HIV prevention programmes have shown some success over the past 2 decades. However, many challenges remain. Wong et al⁵ discuss several worrying trends in sexual behavioural risk factors among at-risk groups and propose prevention education interventions for the future. Understanding high-risk behaviours among at-risk groups is important for the control of HIV. Community-led initiatives have been a cornerstone of the response to HIV since the beginning of the epidemic. Choong et al⁶ describe a local community-based organisation's efforts in adopting a focused, psychosocial approach for men who have sex with men (MSM). Recognising the importance of addressing psychosocial issues to reduce risky sexual behaviours, the organisation combined needs-specific inter-personal skills programmes, community-based psychosocial education approaches, and education on HIV and sexually transmitted infections, so as to holistically improve the psychosocial and sexual well-being of MSM and provide them with the necessary skills for safer sex practices.

The review by Azwa et al⁷ tackles another aspect of prevention in which Singapore and other countries have achieved greater success—the prevention of mother-to-child transmission (MTCT). The authors discuss current management strategies of HIV in pregnancy with emphasis on antiretroviral therapy (ART) and obstetric care in a middle income country such as Malaysia. The option of continuing ART for life in all HIV positive pregnant women irrespective of CD4 count has recently been proposed by the World Health Organization (WHO) as a move towards simplification of regimens and service delivery, prevention of MTCT in future pregnancies, and avoiding stopping and restarting ART. This recommendation will greatly expand the number of women eligible for ART globally including Singapore and should give further impetus to efforts towards universal access to ART.

The need for improved and targeted preventive efforts for older patients is highlighted by two articles (Huggan et al⁸ and Lee et al⁹). A high proportion of newly diagnosed HIV/AIDS cases in both studies were aged 50 years and above. These older patients presented with lower CD4 counts and more non-AIDS morbidity compared to their younger counterparts. Similarly, Chow et al¹⁰ found that in the period of 1996 to 2000 in Singapore, older patients were more likely to die within 5 years of HIV diagnosis than those under the age of 60. The rapid ageing of the Singapore population combined with risk behaviours amongst older men will continue to shape the local HIV epidemic. Health education for older male patients and effective healthcare planning are needed to reduce the burden of infection and manage its consequences. Going beyond the traditional prevention strategies of abstinence, being faithful to one's partner and condom use, Prof Chan¹¹ reviews the results of randomised controlled trials studying the use of ART and other biomedical interventions to prevent HIV transmission.

Complementary to preventive services, early testing and linkage to care, as well as appropriate laboratory support are critical in reducing HIV transmission in the community. Verrall et al¹² report on acute retroviral syndrome mimicking dengue, illustrating the potential for misdiagnosis in dengue-

¹Division of Infectious Diseases, University Medicine Cluster, National University Hospital, Singapore

²Communicable Diseases Division, Ministry of Health, Singapore

³Department of Infectious Disease, Tan Tock Seng Hospital, Singapore

Address for Correspondence: Dr Sophia Archuleta, Division of Infectious Diseases, University Medicine Cluster, National University Hospital, 1E Kent Ridge Road, NUHS Tower Block, Level 10, Singapore 119228.

Email: sophia@nus.edu.sg

endemic areas like Singapore if appropriate confirmatory diagnostic tests are not performed. Patients with dengue-like illness may represent a population to be targeted for HIV screening, although studies on the logistics, yield and cost-efficacy of such a strategy in dengue-endemic settings are required. Chew et al¹³ compared an in-house Sanger sequencing-based genotype resistance testing method developed at the Communicable Disease Centre (CDC), Singapore, to the US Food and Drug Administration (FDA)-approved ViroSeq™ HIV-1 Genotyping System. The assay successfully identified drug resistance mutations in both subtype AE and B, making it suitable for efficient treatment monitoring in genetically diverse populations. At less than half the running cost of the ViroSeq™ assay, this assay could be a useful addition to the currently limited HIV genotyping assay options for resource-limited settings.

As people living with HIV survive for longer periods on combination antiretroviral therapy (cART), there is increasing awareness of the role of non-AIDS HIV-associated complications. Wong et al's¹⁴ retrospective review of the causes of death in hospitalised HIV-infected patients found that a majority (54.7%) of patients died of non-AIDS defining illnesses. Virologically suppressed patients were more likely to die from non-AIDS defining causes. The presence and persistence of immune dysfunction and chronic inflammation before and after initiation of cART have been linked to end-organ dysfunction and the accelerated expression of non-AIDS morbidity. These phenomena may be exaggerated with age and are thought to explain why cART does not fully restore health or lifespan in older people living with HIV/AIDS (PLHA).

Win et al¹⁵ report on the phasing out of stavudine as a first-line agent, reflecting the change in the WHO guidelines as well as the wider availability of tenofovir in the region. However, a significant minority (18.7%) of their cohort remains on stavudine, underscoring that not all patients are able to access the recommended first-line treatment. For patients on appropriate cART, there are still the pitfalls of unexpected drug-drug interactions including efavirenz which is a component of most first-line regimens (Lee et al)¹⁶ as well as the potential of immune reconstitution inflammatory syndrome (Young et al).¹⁷

Even as we increase our armamentarium of HIV prevention, diagnostic and treatment tools, HIV-related stigma and discrimination continue to act as potent barriers to effective responses. Fear of stigma and discrimination negatively impact people's will to be tested or to seek medical care, as illustrated by Dr Ng's article.¹⁸ Tackling this issue at all levels of society is thus vitally important.

Singapore has made significant progress in its efforts to fight the HIV epidemic. However, more can, and must, be done. Our success will be measured by our progress towards the lofty goals articulated in the 8th Singapore

AIDS Conference Declaration—“Getting to Zero—Zero Stigma, Zero New Infections, Zero Deaths” from HIV/AIDS in Singapore.¹⁹ Scientific and societal advancements have moved this vision to within the realm of possibility. “Getting to Zero” will require that we continually develop, adapt and apply evidence-based strategies in a sustainable and coordinated fashion. These strategies must be underpinned by strong political will and leadership, concerted multisectoral efforts, community ownership and activism, and continued resolve towards the creation of an enabling environment which empowers people living with HIV to lead dignified lives, as well as strengthens HIV care and prevention efforts.

REFERENCES

- UNAIDS World AIDS Day Report 2012. Available at: www.un.org/en/events/aidsday/2012/pdf/JC2434_WorldAIDSday_results_en.pdf. Accessed 11 December 2012.
- Ministry of Health, Singapore. Individuals Should Continue to Use “ABCD” to Protect Themselves Against HIV. Available at: www.moh.gov.sg/content/moh_web/home/pressRoom/pressRoomItemRelease/2012/individuals_shouldcontinueuseabcdtoprotectthemselvesagainsthiv.html. Accessed 10 December 2012.
- Global AIDS Response Progress Reporting (GARPR) 2012 – Country Progress Report – Singapore. Available at: www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce_SG_Narrative_Report.pdf. Accessed 10 December 2012.
- Ministry of Health, Singapore. Number of Singapore Residents Reported with HIV/AIDS (1985-2011). Available at: www.moh.gov.sg/content/dam/moh_web/PressRoom/Articles/2012/Annex_HIV%20Figures%202011.pdf. Accessed 10 December 2012.
- Wong ML, Sen P, Wong CM, Tjahjedi S, Govender M, Koh TT, et al. Human immunodeficiency virus (HIV) prevention education in Singapore: challenges for the future. *Ann Acad Med Singapore* 2012;41:602-9.
- Choong BCH, Suthendran S, Chio MTW. The role of lesbian, gay, bisexual, transgender and questioning (LGBTQ)-focused psychosocial approaches as part of human immunodeficiency virus (HIV) prevention efforts in Singapore. *Ann Acad Med Singapore* 2012;41:602-9.
- Azwa I, Khong SY. Human immunodeficiency virus (HIV) in pregnancy: a review of the guidelines for preventing mother to child transmission in Malaysia. *Ann Acad Med Singapore* 2012;41:587-94.
- Huggan PJ, Foo RM, Olsyna D, Chew NS, Smitasen N, Mukhopadhyay A, et al. Presentation and outcome amongst older Singaporeans living with human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS): does age alone drive excess mortality? *Ann Acad Med Singapore* 2012;41:581-6.
- Lee LSU, Pham P, Flexner C. Unexpected drug-drug interactions in human immunodeficiency virus (HIV) therapy: induction of UGT1A1 and bile efflux transporters by efavirenz. *Ann Acad Med Singapore* 2012;41:559-62.
- Chow A, Tey J, Win MK, Leo YS. Causes of death and factors associated with early death among human immunodeficiency virus (HIV)-infected persons in Singapore: pre-highly active antiretroviral therapy (HAART) and peri-HAART. *Ann Acad Med Singapore* 2012;41:XXX-Y.
- Chan R. Biomedical strategies for human immunodeficiency virus (HIV) prevention – a new paradigm. *Ann Acad Med Singapore* 2012;41:595-601.
- Verrall A, Tan JH, Flexner C. Acute retroviral syndrome mimics dengue in Singapore. *Ann Acad Med Singapore* 2012;41:612-4.
- Chew KK, Ng KY, Khong WX, Kaur P, Yap JK, Chua A, et al. Clinical evaluation of an in-house human immunodeficiency virus (HIV) genotyping assay for the detection of drug resistance mutations in HIV-1 infected patients in Singapore. *Ann Acad Med Singapore* 2012;41:553-8.
- Wong CS, Lo FA, Cavailler P, Ng OT, Lee CC, Leo YS, et al. Causes of death in hospitalised human immunodeficiency virus (HIV)-infected patients at a national referral centre in Singapore: a retrospective review from 2008 to 2010. *Ann Acad Med Singapore* 2012;41:571-6.
- Win MK, Leo YS, Chua A. Phasing out the use of stavudine in Singapore: how are we doing in compliance to World Health Organization (WHO) recommendations? *Ann Acad Med Singapore* 2012;41:610-11.
- Lee LK, Seinn OPP, Ng OT, Lee CC, Leo YS, Chua A. Older age at initial presentation to human immunodeficiency virus (HIV) care and treatment at the Communicable Disease Centre (CDC) in Singapore, 2006 to 2011. *Ann Acad Med Singapore* 2012;41:577-80.
- Young BE, Yeo TR, Lim HT, Vong KY, Tan K, Lye DC, et al. Progressive multifocal leukoencephalopathy with immune reconstitution inflammatory syndrome (PML-IRIS): two case reports of successful treatment with mefloquine and a review of the literature. *Ann Acad Med Singapore* 2012;41:615-9.
- Ng DHL. Into the shadow: a reflection on the stigma of human immunodeficiency virus (HIV) in Singapore. *Ann Acad Med Singapore* 2012;41:622-2.
- 8th Singapore AIDS Conference Declaration. Available at: www.sac2012.sg/signdeclaration.html?#pageanchor. Accessed 11 December 2012.