The effect of socioeconomic disadvantage on strategies to end the AIDS epidemic

As Henry David Thoreau, American author, poet, and philosopher, once stated, "The price of anything is the amount of life you exchange for it". In the case of life expectancy, differences in the number of additional years above the average that a person of a specific age will live depends on a person's ability to access economic (eg, income), cultural (eg, education), and social (eg, social supports) capital within a society.[1] Those with less, relative to their income or social status, often pay the most for the length of life they live. Thus, when assessing life expectancy, the price of anything is everything.

In people living with HIV, the uptake of highly active antiretroviral therapy (HAART) has been associated with increased life expectancy. For the first time, people with HIV can expect to live almost as long as their counterparts in the general population.[2] However, as with the general population, several health inequities exist; health outcomes in people living with HIV are affected by ethnic origin, sex, and geography.[3] The Antiretroviral Cohort Collaboration (ART-CC) noted differences in life expectancy between women and men, individuals with a history of injection drug use and those who do not, and regional differences between North America and Europe, although these differences might be attributed partly to issues of death ascertainment between cohorts.[4] The North American AIDS Cohort Collaboration on Research and Design (NA-ACCORD) recorded differences by ethnic origin, with lower life expectancies in African Americans versus other ethnicities.[2] Similarly, the Canadian Observational Cohort Collaboration (CANOC) reported differences between indigenous people and other ethnicities in Canada.[5] Moreover, results of several studies have shown differences in life expectancy by transmission group, with people who have a history of injection drug use having lower life expectancies than other populations.[2,5] Finally, the lack of differences in life expectancy between men and women suggests that women living with HIV are more disadvantaged than HIV-negative counterparts in the general population.[6]

In this issue of *The Lancet Public Health*, Lisa Burch and colleagues[7] reported that in people treated for HIV in the UK, low socioeconomic status (ie, financial hardship, non-employment, rented or unstable housing status, and no university education) was strongly associated with HAART non-adherence and virological non-suppression. In people who were virally suppressed at baseline, all of the four markers of low socioeconomic status were predictive of subsequent virological rebound. As the researchers note, in this universal health care setting, these findings suggest that the implications of poor socioeconomic status "clearly go beyond inability to pay for treatment and health care, and operate strongly even in people engaged with clinical care".[7]

In view of these findings, attention should be focused on supporting HAART adherence, an essential component of virological suppression and HIV prevention,[8] especially in subpopulations that experience increased disadvantage. Factors associated with mortality and unsuppressed viral load resemble those associated with suboptimal adherence. Individuals that show greater vulnerability to suboptimal HAART adherence include individuals who inject drugs and do not access methadone or opioid substitution; have problematic use of crack, cocaine, and alcohol; experience symptoms of depression; and women.[9,10] Marginalisation associated with these factors as well as HIV is compounded by stigma and discrimination, stress, trauma, and lack of social support, all of which undermine HAART adherence.[11]

If the UN 90-90-90 treatment as prevention target is to be achieved even in high and very high human development index countries, the effect of low socioeconomic status on HIV treatment outcomes and ultimately survival needs to be acknowledged. If social disadvantage is not addressed in its many manifestations, health inequities could be exacerbated. This phenomenon is not new; the link between income and survival was prospectively reported early in the epidemic,[12] nor, as noted by Burch and colleagues, is it restricted to HIV.[7] Clearly, indirect investments targeting socioeconomic status will be needed—and as Thoreau notes, these will not come cheap.

Published **Online**
October 12, 2016
http://dx.doi.org/10.1016/S2468-2667(16)30007-X

See **Articles** page e26

For **Thoreau's letters** see http://www.thoreau-online.org/letters-by-thoreau.htm

For the **UN 90-90-90 target** see http://www.unaids.org/en/resources/documents/2014/90-90-90

*Robert S Hogg, Cathy Puskas, Surita Parashar, Julio S G Montaner
Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada (RSH, CP, SP); BC Centre for Excellence in HIV/AIDS, Vancouver, Canada (RSH, CP, SP, JSGM); and Division of AIDS, Faculty of Medicine, University of British Columbia, Vancouver, Canada (JSGM)
bobhogg@cfenet.ubc.ca

JSGM TasP research, paid to his institution, has received support from the BC-Ministry of Health, US NIH (NIDA R01DA036307), UNAIDS, and MAC AIDS Fund. Institutional grants have been provided by Abbvie, Gilead Sciences, J&J, Merck, and ViiV Healthcare. He has served on Advisory Boards for Teva, Gilead Sciences and InnaVirVax. RSH, CP, and SP declare no competing interests.

Copyright © The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY-NC-ND license.

1 Chetty R, Stepner M, Abraham S, et al. The Association Between Income and Life Expectancy in the United States, 2001–2014. *JAMA* 2016; **315:** 1750–66.
2 Samji H, Cescon A, Hogg RS, et al. Closing the gap: increases in life expectancy among treated HIV-positive individuals in the United States and Canada. *PLoS One* 2013; **8:** e81355.
3 Abgrall S, Del Amo J. Effect of sociodemographic factors on survival of people living with HIV. *Curr Opin HIV AIDS* 2016; **11:** 501–06.
4 Antiretroviral Therapy Cohort Collaboration. Life expectancy of individuals on combination antiretroviral therapy in high-income countries: a collaborative analysis of 14 cohort studies. *Lancet* 2008; **372:** 293–99.
5 Patterson S, Cescon A, Samji H, et al. Life expectancy of HIV-positive individuals on combination antiretroviral therapy in Canada. *BMC Infect Dis* 2015; **15:** 274.
6 Machtinger EL, Wilson TC, Haberer JE, et al. Psychological trauma and PTSD in HIV-positive women: a meta-analysis. *AIDS Behav* 2012; **16:** 2091–100.
7 Burch LS, Smith CJ, Anderson J, et al, for the Antiretrovirals, Sexual Transmission Risk and Attitudes (ASTRA) Study Group. Socio-economic disadvantage and viral load outcomes for HIV positive people on antiretroviral treatment in the UK: cross-sectional and longitudinal analysis. *Lancet Public Health* 2016; published online Oct 12. http://dx.doi.org/10.1016/S2468-2667(16)30002-0.
8 Montaner JS, Lima VD, Barrios R, et al. Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study. *Lancet* 2010; **376:** 532–39.
9 Roux P, Carrieri MP, Cohen J, et al. Retention in opioid substitution treatment: a major predictor of long-term virological success for HIV-infected injection drug users receiving antiretroviral treatment. *Clin Infect Dis* 2009; **49:** 1433–40.
10 Puskas CM, Forrest JI, Parashar S, et al. Women and vulnerability to HAART non-adherence: a literature review of treatment adherence by gender from 2000 to 2011. *Curr HIV/AIDS Rep* 2011; **8:** 277–87.
11 Katz IT, Ryu AE, Onuegbu AG, et al. Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. *J Int AIDS Soc* 2013; **16:** 18640–65.
12 Hogg RS, Strathdee SA, Craib KJ, et al. Lower socioeconomic status and shorter survival following HIV infection. *Lancet* 1994; **344:** 1120–24.