The Malawi Longitudinal Study of Families and Health

Newsletter 2016-2: Population-level Consequences of Antiretroviral Treatment

The University of Malawi College of Medicine

MLSFH Project Description

The ***Malawi Longitudinal Study of Families and Health (MLSFH)*** is one of very few long-standing publicly-available longitudinal cohort studies in sub-Saharan Africa (SSA). With data collection rounds for up to 4,000 individuals in 1998, 2001, 2004, 2006, 2008, 2010, 2012+13, and forthcoming until 2020, it is establishing a rare record of more than two decades of demographic, socioeconomic and health conditions in one of the world's poorest countries. The MLSFH has been the basis of more than 250 publications on topics ranging from sexual behaviors and HIV risks to marriage, migration, intergenerational transfers, noncommunicable diseases and aging. The MLSFH public-use data can be requested on the project website http://www.malawi.pop.upenn.edu. A ***MLSFH Cohort Profile*** in the *International Journal of Epidemiology* provides detailed project information and a review of MLSFH research.

Population-level Consequences of Antiretroviral Treatment (ART)

¶ Can individuals benefit from a medical treatment that they do not even take? Could these *indirect effects* of a medical treatment be sufficiently large to affect economic development? MLSFH research on the population-level consequences of the expansion of Antiretroviral Treatment (ART) in Malawi suggest that the answer to both of these questions is "***yes***."

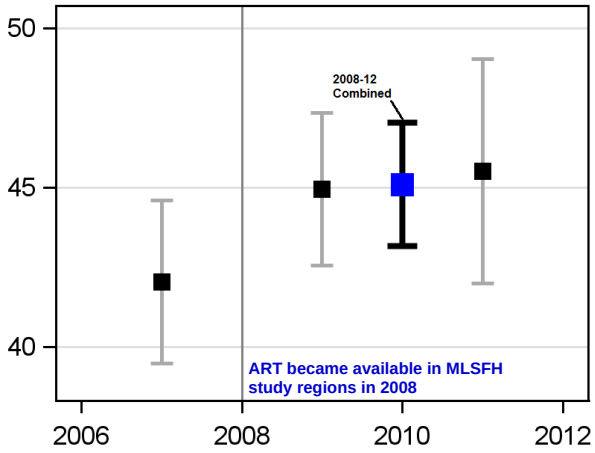
¶ In the past decade, antiretroviral therapy (ART), a highly effective drug treatment that slows the progression of AIDS, has become widely available in sub-Saharan Africa. The medication is rapidly reversing the steep decline in life expectancy, which had fallen by 14 years in southern Africa, due to the AIDS epidemic.

¶ The MLSFH has made important contributions to understanding the population-level consequences of this ART expansion in Malawi, as well as the behavioral responses to ART among both HIV-positive and HIV-negative individuals. Key findings include:

¶ In the four years following roll-out of ART, life expectancy at age 15 (e_{15}) increased by 3.1 years in the MLSFH study population, and median length of life after age 15 rose by over 10 years.

¶ Mortality rates declined among males and females, in all three MLSFH regions, and more strongly among those with more formal schooling. Prevalence rate ratios for poor health dropped by over 30% post-ART in ages 15–59 years.

Life expectancy at age 15 in MLSFH Study Population, 2006–2012



¶ The significant reductions in mortality are importantly related to ART reducing the mortality and morbidity among HIV+ individuals.

¶ However, MLSFH research suggests that the effects of ART expansion have been substantially more profound, not just affecting HIV-positive individuals, but also entailing far-reaching consequences for the HIV-negative population that does not directly benefit from receiving AIDS treatment.

¶ The MLSFH could document these *indirect effects* of ART by exploiting that the fact that MLSFH respondents were at different distance to the nearest ART clinic when treatment became available in the MLSFH study regions in 2008.

¶ This MLSFH research shows that access to ART post-2008 has substantially reduced the

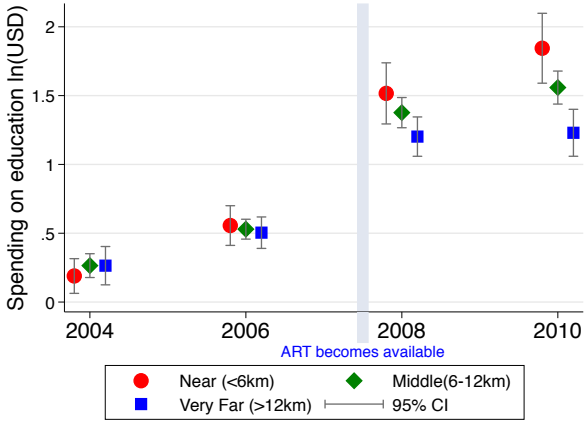
perceptions of mortality risk among HIV-negative individuals as the availability of treatment has subdued fears about the fatal consequences HIV/AIDS.

¶ As a result of these reduced perceived mortality risks, even HIV-negative individuals who do not directly benefit from ART and don't have care-taking obligations for family members with HIV, have enjoyed improvements in mental health and well-being that are associated with a more forward-looking perspective on life.

¶ But the consequences of ART did not stop here. Subsequent to the availability of ART, HIV-negative individuals also worked more, allocated significantly more time to subsistence maize cultivation, and increased maize output. These effects were sizable, increasing for instance daily cultivation time by 17 min (+11%) and other production time by 14 min (+16%).

¶ There are also effects of ART access on savings behavior: halving the distance between a respondent and the ART facility—a reduction of approximately 6 kilometers for the average respondent—results in an increase in the propensity to report any savings by 10 percentage points.

Education expenditures for children among MLSFH respondents near and far from ART clinic



¶ ART availability also increases investment in human capital: reducing the distance by half increases expenditures on children's education by 375 Kwacha (US$2.50) per child (an increase of 2% of annual reported earnings spent on each child) and schooling attainment increases by 0.3 years.

¶Additionally, after treatment became available, individuals who were HIV-negative became less pessimistic about the probability of dying. Their mental health significantly improved, and they became less depressed. None of these effects are related to a direct benefit from ART, as HIV-negative individuals did not benefit from treatment in some direct way.

¶ By showing that HIV-negative people respond strongly to ART availability in terms of risk perceptions and mental health, the study demonstrates that ART has important welfare benefits beyond those directly affected by the epidemic. These indirect effects of ART on individuals not infected with HIV are potentially very important since, even in the countries most affected by the AIDS epidemic, most of the population is HIV-negative.

¶ These MLSFH findings highlight that the disease environment created by the AIDS epidemic affected economic development not only through morbidity and mortality among those infected by HIV, as has previously been shown, but also through changes among HIV-negative individuals in mental health, mortality perceptions and life-cycle behaviors such as work efforts, savings and investments in children that are affected by mortality perceptions.

¶ The expansion of ART has important indirect health and economic effects that extend far beyond the HIV-positive individuals receiving the treatment. And in contexts such as Malawi, where HIV and concerns about HIV have been widespread, these indirect effects of ART are potentially sufficiently sizable to have noticeable effects of the path of economic development.

MLSFH Project Website

http://www.malawi.pop.upenn.edu

Online access to MLSFH micro-data, publications and project documentation: http://www.malawi.pop.upenn.edu. MLSFH Google Scholar Profile: https://scholar.google.com/citations?user=dNEAH3YAAAAJ.

Acknowledgments

The MLSFH gratefully acknowledges the generous support provided by the National Institute for Child Health and Human Development (NICHD, grant numbers R03 HD058976, R21 HD050652, R21 HD071471, R01 HD044228, R01 HD053781, R24 HD-044964), and the National Institute on Aging (NIA, grant number P30 AG12836). The MLSFH has also received funding through the Penn Center for AIDS Research (NIAID AI 045008), the Penn Institute on Aging, the Leonard Davis Institute of Health Economics, the Malawi National AIDS Commission, the Swiss Programme for Research on Global Issues for Development (R4d), and other agencies.

Contact Information

The MLSFH is conducted by the Population Studies Center at the University of Pennsylvania, in collaboration with the College of Medicine at the University of Malawi and Invest in Knowledge in Zomba, Malawi. The contact persons for the MLSFH research on the effects of ART are:

Victoria Baranov, University of Melbourne, victoria.baranov@unimelb.edu.au.

Daniel Bennett, University of Southern California, bennettd@usc.edu.

Collin F. Payne, Harvard University, cpayne@hsph.harvard.edu.

Hans-Peter Kohler, University of Pennsylvania, hpkohler@pop.upenn.edu.

James Mkandawire, IKI, Zomba, Malawi, james.mkandawire@investinknowledge.org.

Victor Mwapasa, College of Medicine, University of Malawi, vmwapasa@medcol.mw.

Additional members of the ***MLSFH Study Team*** are listed on the MLSFH Website.

August 16, 2016