

Policy Brief

Costs and effects of different ART scale-up options in Uganda

Nicky McCreesh¹, Ioannis Andrianakis¹, Rebecca N. Nsubuga², Richard Hayes¹, and Richard G. White¹

¹London School of Hygiene and Tropical Medicine. ²MRC/UVRI Research Unit on AIDS.

Background

With ambitious new UNAIDS targets to end AIDS by 2030, and new WHO treatment guidelines, there is increased interest in the best way to scale-up ART coverage[1].

Ugandan Ministry of Health targets are equally ambitious: a 70% reduction in adult HIV incidence by 2020[2]. To achieve these goals, ART coverage in Uganda will need to increase dramatically over the next few years, as only 50% of all HIV positive people in Uganda received antiretroviral therapy in December 2014[3].

ART and HIV care coverage in Uganda and other sub-Saharan African countries could be increased in a range of different ways however (for instance by increasing HIV testing rates, by making ART universally available to all HIV positive people, and/or by improving retention in care), and it is not clear what is the most cost-effective option.

Resources are limited, and it is therefore essential to prioritise activities that will have the greatest impact on HIV incidence and mortality.

We used a newly developed mathematical model of HIV transmission and ART scale-up to investigate the costs and effects of various ART scale-up options in Uganda.

Methods

We developed and fitted an individual-based model of HIV transmission and ART scale-up in Uganda. The model simulates the formation and dissolution of sexual partnerships, HIV transmission, pre-ART and ART, and the development and transmission of drug resistance. The model was designed to accurately represent the key features of major routes into and through pre-ART care and ART in Uganda. Twenty-two ART scale-up strategies were simulated from 2016-2030, comprising different combinations of six single interventions:

1. Increased HIV testing rates (rate of HIV testing doubled)
2. No CD4 threshold for ART initiation
3. Improved ART retention (rate of dropping-out of ART halved)
4. Increased ART restart rates (rate of restarting ART after dropping out doubled)
5. Improved linkage to care (probability of linking to care following a positive HIV test doubled)
6. Improved pre-ART care (rate of dropping-out of pre-ART care halved, rate of starting ART from pre-ART care when eligible doubled, probability of linking to care doubled)

In addition, two comprehensive interventions were simulated: universal test and treat (UTT, combining interventions 1, 2, and 5), and universal test, treat, and keep (UTTK, combining interventions 1-5).

The incremental costs and disability-adjusted life years (DALYs) averted of each intervention were calculated.

Results and recommendations

Provided that each DALY averted is valued at at least \$210, then removing the CD4 threshold for ART initiation is highly likely to be cost-effective. Removing the CD4 threshold may also be cost saving. We therefore recommend that Uganda adopts WHO guidelines to provide ART to all people living with HIV, regardless of CD4 count. We estimate that this will lead to a 1-9% reduction in HIV incidence in 2030.

If a higher value is placed on DALYs averted, of around \$715 (Uganda's per-capita-GDP), then interventions to improve linkage to and retention in HIV care are likely to be cost-effective. With additional resources, removing the CD4 threshold should therefore be supplemented with interventions aimed at improving linkage to and/or retention in HIV care. This will result in greater reductions in HIV incidence (6-35% reduction in 2030). These interventions should be prioritised above interventions to increase HIV testing rates in the general population.

If DALYs averted are valued at above \$1690 ($2.4 \times$ per capita GDP), then the most cost-effective option was universal test, treat, and keep. A UTTK policy would also result in the greatest reductions in HIV incidence (43-67% reduction in 2030).

References

1. Joint United Nations Programme on HIV/AIDS. 90-90-90: an ambitious treatment target to help end the AIDS epidemic. *Geneva: UNAIDS 2014.*
2. Uganda AIDS Commission. National HIV AND AIDS Strategic Plan 2015/2016-2019/2020. In. Uganda; 2015.
3. Uganda AIDS Commission. HIV and AIDS Uganda Country progress report; 2014. *Kampala: Uganda AIDS Commission 2015.*

About LSHTM

The London School of Hygiene & Tropical Medicine is a world-leading centre for research and postgraduate education in public and global health. Its mission is to improve health and health equity in the UK and worldwide; working in partnership to achieve excellence in public and global health research, education and translation of knowledge into policy and practice.

<http://www.lshtm.ac.uk/index.html>

About MRC/UVRI Uganda Research Unit on AIDS

The MRC/UVRI Uganda Research Unit on AIDS is an internationally recognized center of excellence for research on HIV infection and related diseases, contributing knowledge on the evolving epidemic, the evaluation of innovative health care options, treatment and prevention, and the development of health policy and practice in Africa and worldwide.

<http://www.mrcuganda.org/>