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Many pathways to ending AIDS by 2030

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The Rukarara River in western Rwanda is the most distant headwater of the Nile, the longest river in the world. Water originating here joins water from thousands of other tributaries to journey along one major path more than 7000 km long to the Nile delta, where it then branches into several other pathways that drain into the Mediterranean Sea.[1] Like the Nile River, HIV response efforts in sub-Saharan Africa originate from numerous inputs joining a common pathway of prevention and treatment scale-up across the region. But to reach the goal of ending AIDS by 2030,[2] we must also consider other pathways and subnational data is needed to guide us.

As of 2016, about 70% people with HIV are living in sub-Saharan Africa, of whom 53·9% have access to antiretroviral therapy (ART).[3] ART coverage in sub-Saharan Africa has substantially improved, contributing to remarkable declines in HIV-associated morbidity and mortality, and increasing life expectancy.[4,5] With the goal of ending AIDS by 2030, global guidance on implementing biomedical, behavioural, and structural interventions, including the rapid scale-up of ART to achieve the UNAIDS 90-90-90 targets have been proposed.[6] But to effectively evaluate the effect of these response efforts, a more nuanced understanding of the epidemiology of HIV, and methods for measuring disease frequency at the regional, national, and sub-national levels is crucial.

Ayesha Kharsany and colleagues[7] presented data from one of the highest HIV prevalence regions in the world. The authors reported that a population-weighted HIV prevalence was 36·3% in one community of KwaZulu-Natal, South Africa, with statistically significant differences between men and women. They reported low ART coverage at 45·6% among women and 36·7% among men and similarly low prevalence of viral suppression, at 54·8% among women and 41·9% among men. The authors acknowledge the limitations of identifying independent predictors of prevalent infections and conclude by suggesting response efforts be risk-based, targeting those most likely to be associated with a diagnosis of HIV.

In some regions of sub-Saharan Africa, HIV prevalence has increased, with some of the highest estimates and disease burden in the world reported in KwaZulu-Natal, South Africa.[8] Is increasing prevalence a result of increasing trends in new infections or because of greater access to diagnostic and treatment services leading to lower mortality? Subnational data might help to answer these questions.

Measurement of HIV incidence rather than prevalence is better for identifying factors linked to risk of new infection; however, study implementation challenges and differences in methods can produce widely differing estimates. For example, the Rwanda AIDS

Incidence Survey (RAHIS) estimated a 1 year incidence of 0·27 per 100 person-years (95% CI 0·18–0·35)—twice the estimate produced by Spectrum modelling.[9] Despite some shortcomings, the advantage of the RAHIS methodology is its ability to detect localised outbreak infections that mathematical modelling has been unable to show.

Treatment scale-up has been a big success story for sub-Saharan Africa and directly linked to reductions in new HIV infections.[10] But treatment must not be considered the only pathway to ending AIDS. Other branches of this journey, to take us the final mile, must include simultaneous efforts to expand the delivery of behavioural interventions, including adherence support, and structural interventions that improve access and uptake of ART services. Structural interventions that have been successful in Rwanda have included concurrent efforts to scale up ART along with health system strengthening activities including roll-out of a national community-based insurance scheme (Mutuelle de Santé) and health-facility performance-based financing.[11] Finally, strengthened data systems to track the epidemic and guide response efforts are needed to empirically measure success.[12]

Kharsany and colleagues addressed many of these challenges for high prevalence settings where low ART coverage resulting in a high community viral load will continue to limit efforts to control HIV. Although ART scale-up has been a success story for sub-Saharan Africa, Kharsany and colleagues remind us that understanding the sub-national context is still needed to better guide response efforts. In the HIV response for sub-Saharan Africa, we have arrived at the delta of the Nile River, with many pathways ahead to consider. Subnational data are crucial to investing in the right combinations of pathways to end AIDS by 2030.

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Treatment for HIV prevention, one couple at a time

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The belief that treatment of HIV infection will reduce the spread of the virus was inspired by a series of observational studies of HIV serodiscordant heterosexual couples, in which HIV transmission was reduced or eliminated if the sexual partner with HIV was given antiretroviral therapy (ART),[1] and by the results of the HPTN 052 multinational randomised controlled trial.[2] However, these studies included few homosexual couples; therefore, the risk of HIV transmission from condomless anal intercourse could not be addressed.

Bavinton and colleagues[3] report on the Opposites Attract study of HIV transmission in serodiscordant homosexual couples living in Australia, Brazil, and Thailand. 343 couples were followed up for 588·4 couple-years. More than 75% of HIV-positive partners had durable suppression of HIV to less than 200 copies per mL with ART. Bavinton and colleagues detected no phylogenetically linked HIV transmission events in 16 800 acts of condomless anal intercourse reported. Three participants acquired HIV from a