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Trends in and projections of HIV testing and condom use behaviors in African countries: A Bayesian analysis of progress towards UNAIDS targets

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Abstract

Objective: Africa has the highest burden of HIV/AIDS in the world. Current reports show that this region is lagging behind in progress toward global HIV elimination targets. This study aims to investigate the trends in and projections of HIV testing and condom use and to calculate the probability of reaching key UNAIDS targets for HIV elimination behaviors in African countries.

Methods: A systematic review was conducted to understand the research in context. DHS and MICS data of 38 African countries from 2003 to 2018 were used to obtain prevalence of annual HIV testing and condom use. Bayesian mixed effect models then were applied to estimate and project the trends for every country and year to 2030, and compute the probability of reaching UNAIDS targets in 2020 and 2030 using the posterior predictive distribution.

Results: None of the previous works assessed the trends in and projections of annual HIV testing and condom use, or progress towards the key UNAIDS targets, or calculated the probability of reaching these targets for African countries by using Bayesian analysis and

original datasets. Upward trends in annual HIV testing and condom use were observed in most African countries. No country was projected to have high probability of reaching the first UNAIDS target due to the low rate of changes in annual HIV testing and lack of significant changes in the proportion of condom use. There are wide variations in outcomes between countries with the same development level.

Conclusion: This study shows little progress has been made in critical components of Treatment-as-Prevention strategies in Africa, and little prospect of African countries reaching the global targets that have been established as a minimum requirement to achieve HIV elimination. The results suggest inadequate resource allocation or low effectiveness of HIV prevention programs in some countries. Although some global funding agencies are considering withdrawal from supporting HIV treatment-as-prevention strategies in Africa, more considerable attention to funding and expanding testing and treatment are needed if HIV elimination in this region is to become more than a distant dream.

Keywords: Africa, UNAIDS, targets, 90-90-90, Treatment as Prevention, TasP, Bayesian