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## The potential impact of Pre-Exposure Prophylaxis (PrEP) on HIV transmission in sub-Saharan Africa

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### OBJECTIVES

To determine the potential impact of Pre-Exposure Prophylaxis (PrEP) on HIV transmission in sub-Saharan Africa.

### METHODS

We use a deterministic compartmental mathematical model of the HIV epidemic using data from sub-Saharan Africa to assess the impact after 5 years of a PrEP intervention targeting adult men and women (aged 15-49 years) in all sub-Saharan African countries. The base case scenario assumes a PrEP effectiveness of 68%, a condom use at baseline of 30% and coverage similar to present country coverage for antiretroviral therapy according to the World Health Organization's 2010 guidelines (average of 37% in sub-Saharan Africa).

### RESULTS

In sub-Saharan Africa, over 5 years, the intervention would prevent 3,729,640 infections (95% CI: 2,743,878-4,748,376), 824,727 deaths (95% CI: 612,836-1,039,933), and 93,241,000 Disability-Adjusted-Life-Years (DALYs) (95% CI: 68,596,939-118,709,399). South Africa obtains 24% of the benefits while Ethiopia, Nigeria and the Democratic Republic of the Congo obtain respectively 13%, 6% and 4% of the benefits. Mauritania sees the lowest HIV infections averted per capita with 94 infections averted per 100,000 (95% CI: 68-120), while Botswana sees the highest with 4,829 infections averted per 100,000 (95% CI: 3,610-6,048). HIV prevalence, male circumcision prevalence and intervention coverage are key drivers for the impact of the intervention.

### CONCLUSION

PrEP can have a substantial impact on the HIV epidemic in sub-Saharan Africa, most particularly in countries undergoing a high-level generalized epidemic and presenting low levels of male circumcision such as South Africa.