



Oral Pre-Exposure Prophylaxis Modeling Results: Mozambique

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Overview

Oral pre-exposure prophylaxis (PrEP) is the use of oral antiretroviral medications by HIV-negative individuals to prevent HIV acquisition. Following World Health Organization guidance in 2015 that recommended PrEP use by individuals at substantial risk of contracting HIV, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) incorporated PrEP into its comprehensive HIV prevention programming. Ministries of health began integrating oral PrEP into their HIV prevention efforts.

Mozambique has a generalized HIV epidemic, with a prevalence of 13.2 percent among adults ages 15–49 (MISAU et al., 2017). Highly affected populations include young women and sero-discordant couples.

The Mozambican Ministry of Health has been assessing the feasibility of integrating oral PrEP into the national HIV strategic plan, PEN IV, since 2017. The PEN IV seeks to implement universal HIV testing and treatment (“test and start”) by 2021 in the context of broader combination prevention efforts, in alignment with the UNAIDS Fast Track targets.

To assist the national HIV program in integrating oral PrEP into their existing HIV prevention strategy, the Health Policy Plus (HP+) project, funded by the U.S. Agency for International Development (USAID) and PEPFAR, developed a new mathematical modeling approach to estimate the impact and cost-effectiveness of different oral PrEP scale-up scenarios. The approach uses the Incidence Patterns Model to estimate HIV incidence by risk group and province in combination with the Goals model to project oral PrEP impact in the context of the national HIV prevention program.

In close coordination with the Ministry of Health, HP+ developed three rollout scenarios that model the cost and impact of providing oral PrEP to selected risk groups that have high HIV incidence and are priority populations under the PEN IV: female sex workers, sero-discordant couples, and medium-risk young women (see Box 1). Medium-risk young women were defined in the model to be women ages 18–24 who were not female sex workers but had multiple partners. In the modeled scenarios, oral PrEP coverage was scaled up to reach 50 percent of the target population by 2030.

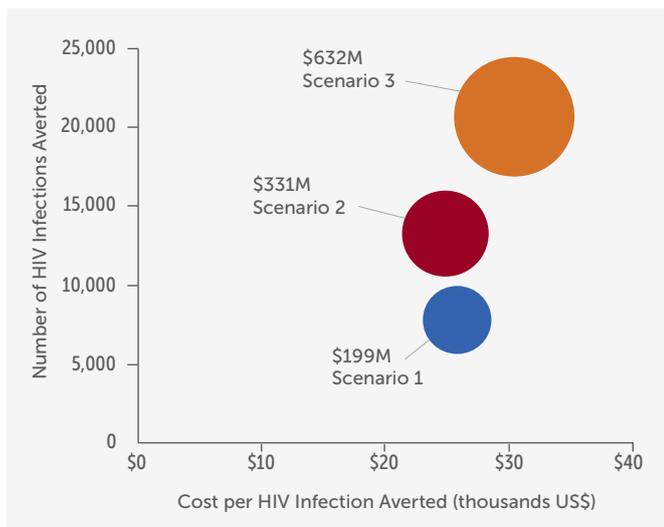
Box 1. Oral PrEP Rollout Scenarios

1. Female sex workers and sero-discordant couples
2. Populations in scenario 1 + medium-risk young women in provinces with HIV incidence that is higher than the median
3. Populations in scenario 1 + medium-risk young women in all provinces

Results

The results of the rollout scenario analysis suggest that expanding oral PrEP in Mozambique beyond female sex workers and sero-discordant couples (scenario 1) to include geographically prioritized medium-risk young women (scenario 2) can increase both impact and cost-effectiveness. Scenario 3 was estimated to avert the most HIV infections—nearly 21,000—without substantially sacrificing cost-effectiveness compared to scenario 2 (see Figure 1).

Figure 1. Cost-Effectiveness, HIV Infections Averted, and Total Cost by Oral PrEP Rollout Scenario, 2018–2030

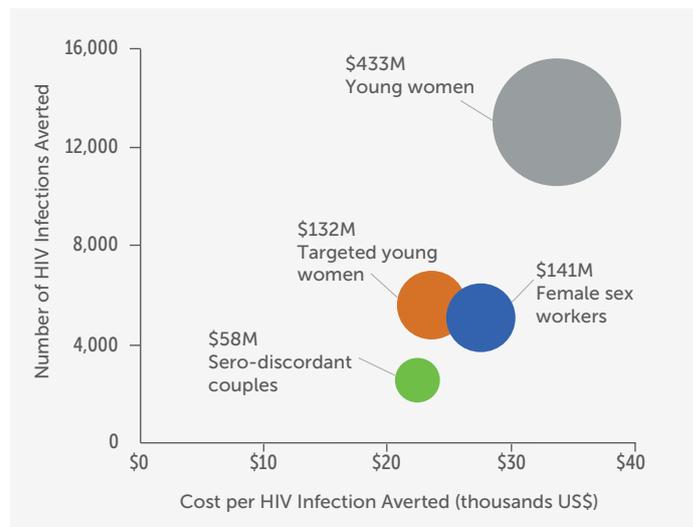


Bubble size and data labels reflect total cost of adding oral PrEP program (in US\$ millions).

By individual risk group, the projected cost per HIV infection averted was lowest (i.e., most cost-effective) for sero-discordant couples, at US\$22,000, and highest (i.e., least cost-effective) for medium-risk young women, at US\$33,000. Providing oral PrEP to medium-risk young women in provinces with HIV incidence higher than the median was nearly as cost-effective (US\$24,000) as PrEP for sero-discordant couples (see Figure 2). Providing oral PrEP to medium-risk young women across the country was projected to have the greatest impact, averting a projected 13,000 HIV infections from 2018 to 2030.

These estimates were sensitive to changes in oral PrEP adherence; strategies with lower adherence averted fewer infections and were less cost-effective than those with higher adherence. Likewise, PrEP is more impactful and cost-effective when scale-up of other combination prevention interventions is delayed, particularly antiretroviral therapy and voluntary medical male circumcision. The analysis is also sensitive to unit cost differences across risk groups.

Figure 2. Cost-Effectiveness, HIV Infections Averted, and Total Cost by Risk Group, 2018–2030



Conclusion

Oral PrEP is an important component of combination HIV prevention programs, given its potential to protect highly vulnerable and underserved populations. These modeling results encouraged Mozambique’s Ministry of Health to consider expanding oral PrEP beyond female sex workers and sero-discordant couples to include higher-risk young women, a population not previously prioritized for oral PrEP rollout.

References

Ministério da Saúde (MISAU), Instituto Nacional de Estadística (INE), e ICF. 2017. *Inquéritos de Indicadores de Imunização, Malária e HIV/SIDA em Moçambique 2015*. Maputo, Moçambique; Rockville, Maryland, EUA: Instituto Nacional de Saúde, INE e ICF.

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