Investing in Optimized HIV Prevention Among Young Men Who Have Sex With Men in Brazil: Insights From Fiscal Health Modeling

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Key Takeaways

- **A fiscal health model assessed the fiscal impact of optimizing HIV prevention among young men (aged 15-29 years) who have sex with men from a government perspective in Brazil**
- **Optimizing HIV prevention averts >70,000 HIV diagnoses and shows a positive return on investment, generating a 7% to 22% return over the cohorts' productive lifetimes**
- **Decision-makers should consider long-term perspectives to ensure the value of increased investment in HIV prevention is realized**

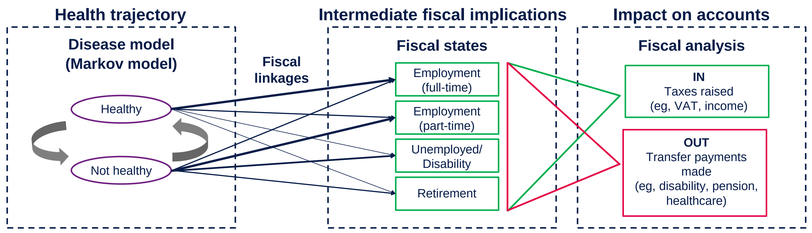
Introduction

- In Brazil, HIV disproportionately affects men who have sex with men (54% of new HIV diagnoses in 2023), and 41% of new HIV diagnoses in 2023 were among young people aged 15 to 29 years[1]
- Despite public availability of daily oral pre-exposure prophylaxis (PrEP) since December 2017,[2] diagnoses of HIV have increased from 2020 to 2023 in Brazil,[1] suggesting suboptimal PrEP uptake and adherence
- Of the 2019 HIV expenditure in Brazil (R$2.7 billion), less than one-quarter was spent on prevention efforts[3]
- Long-acting PrEP modalities, such as long-acting cabotegravir, have been shown to increase PrEP adherence and offer a promising alternative to daily oral PrEP among individuals with suboptimal adherence[4,5]
- Therefore, there may be significant public health benefits that remain unrealized and could be achieved through additional investment by the Brazilian government in publicly provided PrEP programs, including those offering long-acting PrEP in combination with dedicated efforts to increase PrEP uptake and adherence, to optimize HIV prevention
- As people are typically diagnosed with HIV early in their adult lives,[6] various economic and fiscal consequences from lost productivity, forgone professional opportunities, early retirement, and disability accumulate over the lifetime of a person with HIV[7-10]
  - From a government perspective, healthcare interventions that reduce morbidity and increase survival can have both positive and negative fiscal consequences; thus, there is a need to assess the returns from the government's investment in HIV PrEP and support for people with HIV using an economic model simulating government economic benefits and incremental government costs
- To assess the fiscal impact of optimizing HIV prevention among young men (aged 15-29 years) who have sex with men, a fiscal health model was developed that evaluated its return on investment from a government perspective in Brazil

Methods

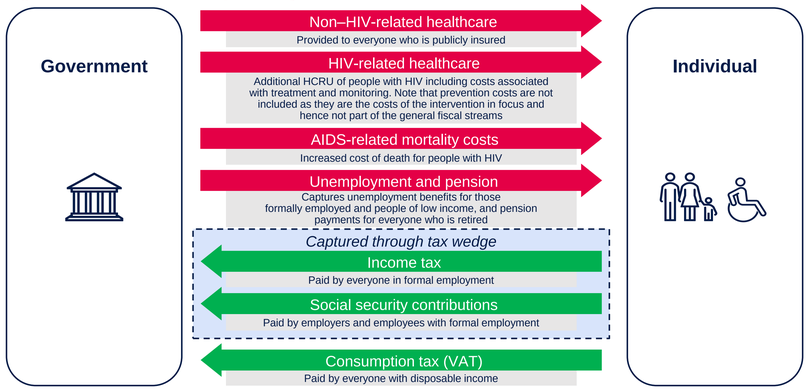
- The fiscal health model links individual health states of a multicohort Markov disease model to 4 fiscal states and captures fiscal streams that flow between individuals and the Brazilian government (Figures 1-2)

Figure 1. A Simplified Example of a Fiscal Health Model and Its Components[a]



VAT, value-added tax. [a]Thickness of blue fiscal linkage arrows indicates that healthy people are more likely to be in full-time employment, while individuals with poor health are more likely to be in part-time employment or unemployed. Green lines indicate inflows to government accounts, while red lines indicate outflows.

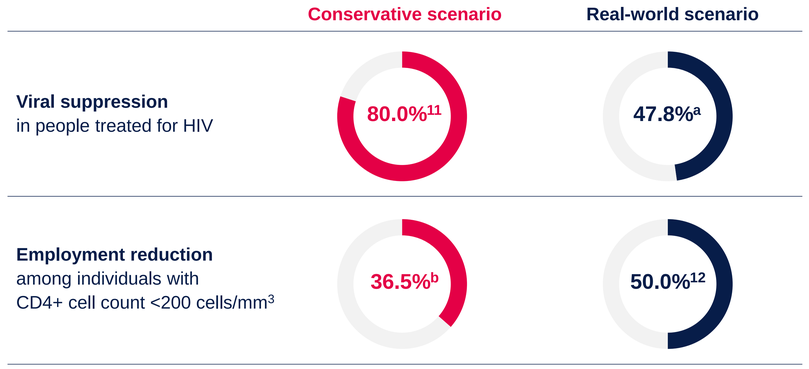
Figure 2. Fiscal Streams Captured by the Fiscal Health Model



HCRU, healthcare resource utilization; VAT, value-added tax.

- The model takes a government perspective and compares the following 2 PrEP interventions among young men (aged 15-29 years) who have sex with men in Brazil:
  - Status quo, which reflects current provision of HIV prevention based on oral PrEP
  - Optimized prevention, which includes availability of long-acting PrEP and outreach programs to increase PrEP uptake and adherence
- Scenario analyses were conducted over the cohorts' total lifetime and productive lifetime (excluding retirement phase) using either conservative estimates or assumptions that likely better reflect real-world values (Figure 3)

Figure 3. Conservative and Real-world Scenarios for Viral Suppression and Employment Reduction



[a]Estimate informed by Mapiye et al[13] and findings from an advisory board conducted in August 2024, which suggested lower rates of viral suppression in specific populations (eg, transgender women). [b]Estimate informed by an employment rate of 56.5% for the general population[14] and findings from Rodríguez-Sánchez et al,[15] which showed a 20.6% reduction in the probability of employment among individuals with HIV and CD4+ cell count <200 cells/mm^3.

Results

- In all scenarios, optimizing HIV prevention averts >70,000 HIV diagnoses
- With the conservative scenario, optimizing HIV prevention
  - Recoups 97% of the investment (loss of R$0.3 billion) over the cohorts' total lifetimes (Table 1)
  - Generates a 7% return on investment (gain of R$0.8 billion) over their productive lifetimes (Table 1; Figure 4)
- With the real-world scenario, optimizing HIV prevention generates a return of 10% over the cohorts' total lifetimes and 22% over their productive lifetimes (Table 1; Figure 4)
- As shown in Figure 4, most cost-offsets stem from gains in tax income and savings in HIV-related healthcare and treatment costs over the cohorts' productive lifetimes

Table 1. Aggregated Fiscal Impact of Optimal HIV Prevention Discounted at 5%

	Total lifetime	Productive lifetime
Conservative scenario		
Average fiscal benefit–cost ratio	0.97	1.07
Total net fiscal benefit	−R$0.3 billion	R$0.8 billion
Real-world scenario		
Average fiscal benefit–cost ratio	1.10	1.22
Total net fiscal benefit	R$1.2 billion	R$2.5 billion

Figure 4. Disaggregated Fiscal Impact of Optimal HIV Prevention Over Cohorts' Productive Lifetimes

Benefits of optimized HIV prevention

From a **public health perspective**
- Prevents >70,000 HIV diagnoses
- Saves R$3 billion on HIV-related healthcare costs over productive lifetimes

From a **budgetary perspective**
- Delivers a 7% return on investment using a conservative scenario and 22% return using a real-world scenario over productive lifetimes

From a **government perspective**
- Provides an investment in young people's future health, which translates into future economic benefits

Conclusions

- The optimized HIV prevention strategy that includes provision of long-acting PrEP and non-pharmacological interventions to improve PrEP uptake and adherence can contribute to a reduction in HIV acquisitions
- Optimizing HIV prevention in young men who have sex with men shows a positive return on investment in Brazil, with most cost-offsets stemming from gains in tax income and savings in HIV-related healthcare and treatment costs over the cohorts' productive lifetimes
- Decision-makers should consider long-term perspectives to ensure opportunities to improve population health and contribute to a stronger economy by investing in HIV prevention are realized

Acknowledgments: This study was funded by ViiV Healthcare. Editorial assistance and graphic design support for this poster were provided under the direction of the authors by Fingerpaint Medical and funded by ViiV Healthcare.

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