



## Minimizing HIV Drug Resistance Risk with ARV-based HIV Prevention

### GEMS - Global Evaluation of Microbicide Sensitivity

Provides a comprehensive assessment of HIV drug resistance risk with pre-exposure prophylaxis (PrEP) use and policy recommendations for the frequency of HIV testing and resistance monitoring for projects implementing PrEP in sub-Saharan Africa.

#### Overview

Minimizing the risk of HIV drug resistance during PrEP rollout is critical to ensure the long-term efficacy of antiretroviral (ARV) medications for both PrEP and HIV treatment. GEMS conducts laboratory studies, develops new resistance assays and performs modeling and cost-effectiveness assessments to create evidence-based policy recommendations for resistance monitoring in PrEP. GEMS also provides technical assistance with resistance monitoring through partnerships with national programs and projects that are facilitating PrEP rollout.

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## Science

The GEMS Laboratory at the University of Pittsburgh is comprehensively characterizing resistance risk from PrEP trials and demonstration projects to understand the duration of time an infected person can be on product before resistance occurs and the impact of resistance on response to future ART regimens.

GEMS is improving existing assays and developing new, more sensitive assays to assess drug resistance in dried blood spot samples, with a goal to analyze a greater number of blood samples at lower cost.

## Modeling

GEMS mathematical modelers are working to identify the most effective and efficient HIV testing and resistance monitoring strategies during PrEP rollout. The first modeling scenarios will be based on data from the Kwa-Zulu Natal region in South Africa. These analyses will provide information on the impact of HIV testing quarterly versus longer duration time points.

Cost-effectiveness analyses will provide information on the implications of various HIV testing frequencies and resistance monitoring and the cost of drug resistance on an individual's future HIV treatment.

## Country Engagement

Strong collaborations with PrEP implementers including country ministries of health, PrEP projects, and other stakeholders that are delivering PrEP is essential for successful resistance monitoring during PrEP rollout. Using resistance data obtained from national PrEP rollout programs, GEMS will develop robust, evidence-based policy recommendations to guide PrEP implementation programs. In addition, GEMS offers the following technical assistance to partnering countries:

### Policy Documents

Review and provide input on policy and guidance documents that specify HIV testing frequency and resistance monitoring plans.

### Specimen Collection

Establish mechanisms for collection of dried blood spot (DBS) samples on seroconverters for resistance testing and analysis reports for in-country use.

### Tools

Provide training materials, templates and other materials to assist countries in planning for drug resistance monitoring.

### Technology Transfer

Offer technology transfer and training to laboratories conducting resistance testing.

## PARTNERS

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