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This publication forms part of the WHO guideline entitled Consolidated guidelines on differentiated HIV testing services. It is being made publicly available for transparency purposes and information, in accordance with the WHO handbook for guideline development, 2nd edition (2014).
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Modelling the use of HIV self-testing for oral PrEP scale-up in Kenya: Impact on drug resistance and HIV outcomes

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Abstract

Background

Provision of community-based oral pre-exposure prophylaxis (PrEP) has the potential to expand PrEP coverage. HIV self-testing (HIVST) can facilitate community-based PrEP delivery, but results may have lower sensitivity than facility-based HIV testing, potentially leading to inappropriate PrEP use among persons with HIV and subsequent development of drug resistance. The impact on drug resistance of HIVST use for PrEP scale-up is not well understood.

Methods

We parameterized an agent-based network model, EMOD-HIV, to simulate PrEP scale-up in western Kenya using four testing scenarios: (1) provider-administered nucleic acid testing (NAT), (2) provider-administered rapid diagnostic tests detecting antibodies (Ab RDT), (3) blood-based HIVST and (4) oral fluid HIVST. Scenarios were compared with a no PrEP counterfactual. Individuals ages 18 to 49 years with one or more sexual partners and who screened HIV-negative were eligible for PrEP. We assessed the cost and health impact of rapid PrEP scale-up using these different HIV testing modalities.

Results

PrEP coverage of 29% was projected to avert 54% of HIV infections and 17% of HIV-related deaths among adults ages 18 to 49 over 20 years; health impacts were similar across HIV testing modalities used to deliver PrEP. The percentage of HIV infections with PrEP-associated resistance to nucleoside reverse transcriptase inhibitor (NRTI) drugs was 0.6% and 0.8% in the blood HIVST and oral HIVST scenarios, respectively, compared with 0.3% and 0.2% in the Ab RDT and NAT scenarios. Accounting for background NRTI resistance, we found similarly low proportions of drug resistance across scenarios. The budget impact of implementing PrEP using HIVST and provider-administered RDT were similar, while NAT was at least 50% more costly.
Conclusions

Scaling up PrEP using HIVST has similar health impacts, costs and low risk of drug resistance as provider-administered RDT. Stakeholders should consider leveraging HIVST to expand PrEP access among those at HIV risk.

Full details are available in the report: https://www.thelancet.com/journals/lanhiv/article/PIIS2352-3018(23)00268-0/fulltext