Title: Comparison of HIV self-testing (HIVST) distribution models in Zambia: potential for impact and sustainability

Authors: Lawrence Mwenge1, Nurilign Ahmed2, Linda Sande3, Collin Mangenah4, Marc d’Elbée2, Sarah Kanema1, Jason J. Ong6, Mutinta Nalubamba5, Sepiso Libamba5, Hambweka Munkombwe5, Pitchaya Indravudh3, Euphemia Sibanda4, Hendramoorthy Maheswaran7, Cheryl Johnson8, Karin Hatzold9, Liz Corbett5,6, Helen Ayles1,6, Fern Terris-Prestholt2

Affiliations:
1Health Economics Unit, Zambart, Lusaka, Zambia
2Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, London, United Kingdom
3Malawi-Liverpool Wellcome Trust Clinical Research Programme, Blantyre, Malawi
4Centre for Sexual Health and HIV AIDS Research Zimbabwe
5Society for Family Health, Zambia
6Faculty of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London, United Kingdom
7Liverpool School of Tropical Medicine, Liverpool, United Kingdom
8Department of HIV/AIDS, World Health Organization, Geneva, Switzerland
9Population Services International, Harare, Zimbabwe

BACKGROUND
Zambia is piloting HIV self-testing (HIVST) to inform the national HIV testing guidelines through the projects: ‘HIV Self-Testing Africa’ (STAR) and home-based HIVST distribution model (HB-HIVST). Under STAR, HIVST kits were distributed through community-based distribution agents (CBDAs), voluntary medical male circumcision (VMMC) and health facility (HF) models. HB-HIVST distributed HIVST kits through door-to-door HIV testing services (HTS) offered the choice of counsellor-provided finger-prick rapid HIV testing or oral HIVST in the presence or absence of the counsellor. We present the cost of both HTS models and examine the impact and sustainability of each model.

METHODS
We undertook full economic costing with prospectively collated costs and outcome data from the start of implementation: for STAR over 11 months (July 2016- May 2017) in 16 communities and for three months (December 2016 - June 2017) in four communities for HB-HIVST. All costs are presented in 2017 US$. Numbers of tests and unit costs per test are presented by model.

RESULTS
STAR distributed 127,804 HIVST kits, through CDBA (81%), HF (10%) and VMMC (9%) models. The HB-HIVST model tested 4,561 individuals. The costs per HIVST kit distributed were US$17.36 (SD: US$8.60), US$16.23 (SD: US$4.95), US$17.31 (SD: US$8.66) and US$18.45 for CBDA, VMMC, HF and HB-HIVST models, respectively. Though averages, were similar, quantities distribution and total costs varied widely accross communities [pic_1].

CONCLUSIONS
Costs for HIVST distribution were similar across the three models suggesting programmes incorporate HIVST flexibility to consider preferences vary across
individuals and broadening choice is likely to increase coverage. Consequently, HB-HIVST model demonstrates that HIVST can be integrated within existing structures of community distribution of health products. Further research, around technical efficiency and distribution saturation, is needed for great impact on narrowing HIV testing gaps.

**Figure 1: Cost of STAR models across communities (2017 US$)**