

HIV self-testing in Singapore is safe, feasible and acceptable: Results from a pilot implementation project

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Dear Editor,

The Joint United Nations Programme on human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) (UNAIDS) has set an ambitious goal to end AIDS by 2030 by achieving the 95-95-95 testing and treatment targets by 2025, where 95% of all people living with HIV should be aware of their HIV status, 95% of all people diagnosed with HIV infection should receive antiretroviral therapy (ART) and 95% of all people receiving ART should have sustained viral suppression.¹ The first of the UNAIDS 95-95-95 targets is particularly important. In Singapore, only 85% of individuals with HIV are aware of their status,² and HIV self-testing (HIVST) has the potential to increase access and close the gap towards achieving the UNAIDS' testing target. From 1 August 2022 to 31 March 2024, the HIVST pilot project was implemented in Singapore to assess real-world acceptability of HIVST and its safe and effective use among at-risk individuals in Singapore, prior to a national roll-out.

The HIVST pilot was implemented at the Action for AIDS (AfA) Anonymous Testing Service (ATS) and the Department of Sexually Transmitted Infection Control (DSC) clinic, using OraQuick HIV Self-Test (OraSure Technologies Inc, Bethlehem, PA, US), the only World Health Organization-prequalified rapid diagnostic test that utilises oral fluid for HIVST and the only Health Sciences Authority-approved kit in Singapore. The pilot was later expanded to include the Mobile Testing Service at AfA from 1 February 2023 and bulk sales of HIVST kits to Project X³ by AfA from 1 October 2023. These 2 expansions were introduced after a year of successful implementation, with no major technical issues or crisis calls reported.

Individuals aged 21 and above (age of majority in Singapore) could purchase up to 3 kits per visit and were asked to complete an anonymous survey. Optional pre-test counselling was offered, and hotline

support was available for technical issues or distress. HIV confirmation testing was complimentary for HIVST users who returned to pilot sites for confirmatory testing.

A total of 3574 HIVST kits were sold to 2107 individuals during the pilot period, with an average of 179 kits sold per month. The buyers were predominantly male (93.8%), aged 21–39 years (65.9%), did not opt for counselling (86.0%) and purchased the kits for self-use (73.7%). More than a quarter of buyers (28.0%) were first-time testers. Of these, only 10.0% opted for pre-test counselling. Half of the users were repeat HIV testers who had never previously used HIVST (50.4%). There were 4 reactive HIVST cases (0.19%) detected, all of whom were linked to care within 1 month. No technical or distress calls were received. Detailed demographic characteristics of individuals who purchased the HIVST kits are shown in Table 1.

In this pilot, HIVST was successfully implemented in Singapore and found to be acceptable, safe and effective, in concurrence with numerous other jurisdictions.^{4,7} The pilot saw a significant proportion of first-time testers (28.0%), comparable to the proportion of first-time testers (33.4%) observed across the 10 anonymous test sites¹ within the same period (unpublished data from the anonymous HIV testing programme). This suggests that HIVST might be reaching those who were not testing for HIV through ATS or other testing modalities, and may prove helpful in Singapore's efforts to achieve the first UNAIDS 95-95-95 target of knowing one's HIV status.

Interestingly, there was no clear correlation observed between counselling uptake and testing experience, as only a small proportion (10.0%) of first-time testers opted for pre-test counselling, suggesting that first-time HIV testers may not require more support than repeat testers. Most users may be comfortable accessing information on their own, regardless of their initial familiarity with HIV or HIV testing. The layered

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Table 1. Demographic characteristics of HIVST users.

	All No. (%)	AfA No. (%)	DSC No. (%)
Unique users	2107	507	1600
No. of HIVST kits sold	3574	870	2704
Sex			
Male	1976 (93.8)	478 (94.3)	1498 (93.6)
Female	124 (5.9)	27 (5.3)	97 (6.1)
Others	5 (0.2)	2 (0.4)	3 (0.2)
Unknown ^a	2 (0.1)	-	2 (0.1)
Age group (years)			
21–29	581 (27.6)	137 (27.0)	444 (27.8)
30–39	807 (38.3)	192 (37.9)	615 (38.4)
40–49	460 (21.8)	134 (26.4)	326 (20.4)
50–59	180 (8.5)	36 (7.1)	144 (9.0)
60 and above	73 (3.5)	8 (1.6)	65 (4.1)
Unknown ^a	6 (0.3)	-	6 (0.4)
Previously declined HIV testing			
Yes	77 (3.7)	15 (3.0)	62 (3.9)
No	2026 (96.2)	492 (97.0)	1534 (95.9)
Unknown ^a	4 (0.2)	-	4 (0.3)
Pre-test counselling			
Yes	296 (14.0)	260 (51.3)	36 (2.3)
No	1811 (86.0)	247 (48.7)	1564 (97.8)
User profile			
First-time tester	591 (28.0)	109 (21.5)	482 (30.1)
Repeat tester who was HIVST naïve	1062 (50.4)	304 (60.0)	758 (47.4)
Repeat tester who was HIVST experienced	451 (21.4)	94 (18.5)	357 (22.3)
Unknown ^a	3 (0.1)	-	3 (0.2)
Use of test kits			
Self-use	1553 (73.7)	353 (69.6)	1200 (75.0)
For partner	113 (5.4)	27 (5.3)	86 (5.4)
For both self and partner	424 (20.1)	122 (24.1)	302 (18.9)
Others ^b	17 (0.8)	5 (1.0)	12 (0.8)

AfA: Action for AIDS; DSC: Department of Sexually Transmitted Infection Control; HIV: human immunodeficiency virus; HIVST: HIV self-testing

^a Some users did not complete or omitted certain questions on the pre-purchase survey.^b For friends or others other than partner.

technical and counselling support provided to all users through the provision of written and video instructions, as well as dedicated, staffed hotline numbers for troubleshooting and/or counselling support, appears to be sufficient given the high levels of education and health literacy in Singapore. However, further study is needed to determine the utility of pre-test counselling, as it remains unclear whether HIVST users declined pre-test counselling because they deemed it unnecessary or considered it intrusive or troublesome.

Several limitations of the pilot were also noted by the authors, such as the age restrictions and purchase limits per user, which may have constrained the reach of HIVST; the sales of HIVST kits were still limited in reach and coverage, owing to the fixed opening hours of both the pilot sites; a second-generation test kit with a longer window period of 3 months after exposure was used in the pilot, which may be less sensitive as compared to blood-based HIVST kits that are usually third- or fourth-generation tests with a shorter window period allowing for diagnosis as early as 2 weeks after exposure.

As it is not uncommon for those under 21 to be sexually active,^{8,9} and since the largest proportion of HIVST users from the pilot are in the younger age group, such limitations may run counter to the intent of HIVST to lower barriers to testing and encourage voluntary testing by all at-risk individuals and their sexual contacts. The available roster of self-test modalities, including finger-prick-based kits and fourth-generation test kits should also be expanded, under prevailing regulatory and safety frameworks in Singapore, to meet the diverse testing needs and preferences of individuals.

With the successful completion of the pilot project, which demonstrated the acceptability, safety and effectiveness of HIVST among at-risk individuals, the authors recommend making HIVST kits available for sale at retail pharmacies nationwide, with the option of online sales by retail pharmacies, analogous to the distribution model for COVID-19 self-test kits. Increased uptake of HIVST could reduce the need for in-person visits to healthcare facilities for HIV testing, which is of particular importance in the context of epidemics or pandemics like COVID-19. Through careful planning and implementation, it has the potential to greatly impact the HIV care continuum in Singapore by offering those at risk of infection the opportunity for early diagnosis and linkage to care.

Ethics statement

This article used anonymous demographic data collected from a pilot sales of HIV self-testing kits in Singapore, commissioned by the Ministry of Health

(MOH), Singapore. The protocol and manuscript were reviewed and approved by senior management at MOH on 13 April 2022 and 1 July 2025, respectively.

Declaration

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