

HIV self-tests for men who have sex with men, accessed via a digital vending machine: a qualitative study of acceptability

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Abstract

As the number of people living with undiagnosed HIV infection in the UK declines, innovative ways to access those least engaged with services are needed. This study explores the attitudes of men who have sex with men (MSM) towards using HIV self-testing (HIVST) kits distributed via a vending machine in a sauna (a licenced sex-on-premise venue). Twenty-three MSM attending the sauna were recruited to take part in semi-structured qualitative interviews. The participants were overwhelmingly positive about the HIVST vending machine. They identified convenience and flexibility as major benefits to testing in this way. The sauna was felt to be an appropriate location for the intervention. Limitations identified included the potential to reduce screening for other sexually transmitted infections and the inappropriate use of HIVST kits as a tool for risk-assessment prior to condomless sex, with a poor understanding of the window period. The implications of receiving a positive result without immediate access to support were also a concern. HIVST vending machines are an acceptable, innovative way to encourage HIV testing. Providers need to ensure this intervention is supported by adequate information regarding the limitations of the test and how to access comprehensive services to avoid any unintended negative effects.

Keywords

HIV, screening, high-risk behaviour, Europe

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Introduction

In the UK, 77 per 1000 sexually active men who have sex with men (MSM) 15–59 years of age are living with HIV.¹ MSM also make up the largest proportion of people living with undiagnosed HIV, with an estimated 5800 MSM in the UK unaware of their HIV-positive status.¹ However, for the first time since the start of the HIV epidemic, the number of new HIV diagnoses among MSM in the UK has started to fall. This decline has been attributed to frequent testing and prompt treatment.² Of the people diagnosed with HIV in the UK, 98% are on antiretroviral therapy and of those, 97% have an undetectable viral load.³ Once virological suppression is achieved, there is no risk of sexual transmission of HIV to others.⁴

As the pool of people living with undiagnosed HIV infection declines, more innovative ways to access those

least engaged with clinical and community sexual health services are needed. One strategy is the distribution of HIV self-testing (HIVST) kits which removes the need for attendance at a traditional testing site.

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HIVST has been legal in England, Scotland and Wales since 2014.⁵ Users conduct the test (using oral fluid or finger-prick blood samples) and interpret the result themselves with no additional laboratory processing. This has been found to increase first-time and repeat testing^{6,7} and to be acceptable to MSM^{8–10} and other groups disproportionately affected by HIV.¹¹ It has also helped to overcome barriers to HIV testing including fear of stigmatisation and breach of confidentiality¹² with users placing a high value on the confidentiality and privacy self-testing provides⁸ in addition to being more convenient than attending a clinic.¹⁰

Since June 2017, MSM have been able to access HIVST kits for free via a bespoke vending machine located in the foyer of a sauna (a licenced sex-on-premises venue). The vending machine was designed by a collaboration of HIV specialist clinicians, community volunteers and technical experts. It dispenses BioSURE HIVST kits which use a finger-prick blood sample to detect HIV-1 and -2 antibodies in 15 minutes. The kits have a window period of between four and nine weeks between potential HIV exposure and when an accurate test result is possible at which point they have a sensitivity and specificity of 99%.¹³

This study aimed to explore the experiences and attitudes towards using the HIVST vending machine among MSM attending the sauna.

Methods

Study design: Cross-sectional study using qualitative semi-structured interviews. **Study participants:** Men who self-identified as either gay, bisexual or MSM, and who attended a sauna in Brighton between July and December 2017 were approached to take part in the study.

Procedure: Study participants were recruited by a researcher who identifies as MSM and has significant experience in both clinical sexual health and sexual health research. A convenience sample was used and the researcher either approached potential participants in the sauna's café or contacted people by telephone (in the case of previous HIVST vending machine users who had provided contact details). Study participants gave written or verbal informed consent and received £20 in acknowledgment of their time.

Study participants were interviewed by the researcher either face-to-face in a private room in the sauna or by telephone. Demographic information including age and postcode was collected as well as details of previous HIV testing. This was followed by a 20–30 min semi-structured interview conducted using a topic guide (see online supporting information). All interviews were recorded and transcribed verbatim.

Demographic characteristics of the participants were analysed using descriptive statistics. Interviews were analysed using a framework analysis,¹⁴ a matrix-based approach to identify important and recurring themes based on a combination of a-priori issues, recurring attitudes and emergent experiences generated by participants. Initial analysis systematically classified data into themes and categories. Repeated analysis produced further sub-themes and quotes that were cross-coded into themes in an Excel framework generating a detailed referencing of interviews. A second coding analysis was performed by a different researcher and any discrepancies discussed. The study received ethical approval from the Brighton and Sussex Medical School Research Governance and Ethics Committee (ERA/JV95/1).

Results

Demographic and background information

Twenty-three men were recruited to the study: 13 in person at the sauna and 10 by telephone. An additional 23 HIVST vending machine users gave consent to be contacted but were not included as data saturation was reached after the initial ten telephone interviews meaning that no new themes were emerging. Two men approached for recruitment in the sauna declined to participate.

The average age of participants was 43 years (range 21–58). Of the 13 participants recruited in person, only three (23%) were aware of the vending machine, all as a consequence of being informed by a member of the sauna staff. None of them had used the machine. Of the ten participants contacted by phone after using the vending machine, one participant was not aware of the machine as his friend had taken the test for him and given his details. Of the other nine, three were aware of the machine as a consequence of seeing it at the sauna, two had been told about it by sauna staff, two made aware by friends, one had been informed by staff at the Terrence Higgins Trust and one had seen a leaflet.

The participants who had used the vending machine were of similar age to those who had not (mean age 40 years versus 45 years), were more likely to have previously attended a sexual health clinic (100% versus 85%) and were more likely to have had an HIV test within the last six months (70% versus 23%).

Of the 23 participants, one (4%) had never had an HIV test, nine (40%) had not tested in the last six months and one reported a 22-year period since his last test (Table 1). Those who had previously tested reported varied locations and frequency of testing, from regular or routine testing, to only testing in

Table 1. Most recent HIV test of study participants.

Time period	Number of participants
That day	2 (9%)
Within the last 3 months	4 (17%)
Within the last 3–6 months	4 (17%)
Within the last 6–12 months	7 (30%)
Within the last 1–2 years	1 (4%)
Over 2 years ago	1 (4%)
Never	1 (4%)
Unknown	3 (13%)

response to symptoms. Of those who had previously tested, 21/22 (95%) had tested at a sexual health clinic, 14/22 (64%) had tested via a community service and 12/22 (55%) had tested at a sauna. Participants were asked to estimate when they last had an HIV test (Table 1).

Semi-structured interviews

During the semi-structured interviews, participants identified a number of advantages and limitations to HIVST kits and also discussed their views regarding the location of the vending machine in the sauna and potential alternative locations.

Advantages of HIVST vending machines

Study participants were very positive about the use of an HIVST vending machine within the sauna. The accessibility and the elimination of barriers to using a sexual health clinic were highly valued. Three participants (13%) were not sauna customers and had visited the entrance lobby simply to access the vending machine.

It's sort of a first-come-first-served at the hospitals if I remember rightly. So, it was quite...difficult with work and things to juggle it all around, so this is probably better...it's two birds with one stone. I'm here at the sauna. It suits me very well. (Participant 13, age 58)

Sometimes when I went to be tested...it felt like I was being interrogated...it might have been within my mind...but I felt that I was being sort of judged. (Participant 19, age 53)

While a number of participants used the HIVST kit at the sauna, the majority liked the fact they could take the test away to use in the privacy of their own home. Maintaining confidentiality was cited as the primary advantage, but the ability to take a test to use at a later date was also seen as beneficial. A number of participants acquired multiple tests to allow for

repeated testing at home without the inconvenience of returning to the vending machine.

Three participants had already, or intended to, pass-on self-testing kits to friends who did not test frequently due to various barriers and suggested this informal distribution as a method to support and encourage testing.

I took three actually: one I used after ten days, one I used a few months later and one my friend used... peoples' friends often say they're a bit worried, they need to get a test done and they haven't been in. They find there's that barrier to going in and you might just say 'I've got a self-test here; do you want it?' (Participant 29, age 34)

Limitations of HIVST vending machines

Many participants were concerned the use of HIVST vending machines might undermine more comprehensive sexually transmitted infection (STI) screening. Three participants stated that the HIVST vending machine had already altered their previous pattern of routine screening at a clinic. Some stated that they would now only attend a clinic if they developed symptoms suggestive of an STI. '...yes, unless I have a symptom of an STI I wouldn't think about going automatically... I used to go every six months, when I was having the full MOT, the HIV test, it was the most important really' (Participant 27, age 47).

One participant raised concerns that by providing HIVST vending machines, other sexual health clinic services may be cut. '...you've got to keep those [local sexual health services] options open and you've got to keep choices available. Don't use it as an excuse for some kind of funding cut exercise. That would not be a good idea' (Participant 12, age 54).

All participants were aware of the window period between acquiring HIV infection and a positive result but there were high levels of misunderstanding about its duration. Several participants had used the kit to self-test with sexual partners as part of a risk-assessment process prior to having condomless sex or after an episode of risk, all of whom underestimated or misunderstood the three-month window period. '...you can... use them to show each other you both haven't got HIV and then get on with what you want to get on with' (Participant 29, age 34, last tested three months ago).

Almost all participants expressed concern about the detrimental effect of receiving an unexpected positive result without access to immediate support. Some felt this might be a barrier to using the vending machine.

It's that lack of counselling if somebody does test positive. It's not the best environment to suddenly have emotional trauma. It's not like you can go and find a shoulder to cry on in a sauna... a person might find themselves very alone, very vulnerable with a lot of a fear. (Participant 8, age 54)

I do have two friends that had a friend staying for a week, they were due to come out one night. I don't know why on earth he chose to use a self-test with him, and at about seven o'clock when they were coming out, he got a positive result. Obviously, they didn't come and I think they'd been having unprotected sex... he went to [community sexual health service] the next day for advice... (Participant 29, age 34)

One participant suggested that receiving a positive result in this context may be a barrier to future linkage to care. A number of participants suggested that placing the HIVST vending machine in the waiting room of a sexual health clinic would overcome this issue, allowing support to be provided when required with the additional benefit of reducing waiting times.

Location of HIVST vending machines

Most participants felt the sauna was an appropriate location for an HIVST vending machine and the lobby was appreciated as a discrete area in which to use it. A number cited the reason for this as they considered the vending machines particularly appropriate for specific groups: 'married types', the 'reckless', the 'promiscuous'. 'I think this is the best idea ever. Especially in a gay sauna. I've seen what happens here so I know... this is a perfect public place' (Participant 6, age 53).

A number of participants suggested that some may dislike the placement of the vending machines as they do not want to be constantly reminded of HIV and have a health intervention encroach on their private space.

I guess people who put themselves at risk don't want to be reminded of that risk by having a vending machine that tells them there is a risk. People would rather clear their minds and go into their own zone and do their thing. But I think it's a really poor reason not to have one... I just think it's really positive. (Participant 9, age 28)

It kind of takes time to get used to. But initially I thought, what is that doing there because it's right in front you as you walk in... I just think initially it felt a bit peculiar... It felt a bit like an invasion of your privacy... (Participant 19, age 53)

One participant suggested that locating an HIVST vending machine in a sauna conferred a stigma around testing, while another expressed concern that the location did not target a wide demographic.

I think the sauna has a stigma attached to it... I think the name it has attached to it and what it's associated with is just a barrier for most people... the people that use the saunas would be comfortable... the others wouldn't even consider it. (Participant 21, age 34)

I see it more... as a sort of way of recruiting people who are seroconverted and don't know it yet. Who aren't visiting GUM clinics but I'd have thought that's a pretty small demographic? If you're going to be in a gay bar or a gay sauna there's a very good chance you're not going to be too bothered about walking into a GUM clinic occasionally. (Participant 20, age 51)

Participants suggested alternative venues for HIVST vending machines including gay bars and clubs, pharmacies, GP practices and educational institutions in addition to the waiting rooms of sexual health clinics.

Discussion

Overall the study participants were very accepting of the HIVST vending machine. Most believed that locating it in a sauna was a good idea, that it would encourage more people to test and also support repeat testing, particularly among those engaging in frequent or high-risk sex. They identified benefits including the ease of access, the avoidance of long clinic waiting times and the ability to obtain a test outside of working hours. A number also felt that the vending machine would enable those who find attending a sexual health clinic embarrassing or stigmatising to test more easily.

The study participants also identified a number of limitations to the use of HIVST vending machines in a sauna. These included the potential for reduced attendance at sexual health clinics for the screening of other STIs, poor understanding of the 'window period' by users and the negative impact of receiving a positive test result without access to immediate support.

A notable strength of this study was the comfort participants felt interacting with the trained MSM researcher conducting the interviews. This is likely to have helped participants to feel more confident discussing personal issues and reduced embarrassment as a barrier to eliciting views. However, this sample may not be representative of all MSM, nor other groups affected by HIV. A pre-implementation survey of minority ethnic groups disproportionately affected by HIV

found the majority of those surveyed to be in favour of saunas as a location for HIVST vending machines.¹¹ It would be prudent to revisit this view with all groups following implementation to ensure support remains. This is particularly important in light of the concern raised by one participant that the placement of an HIVST vending machine in a sauna may in fact increase stigma and prevent others accessing tests this way.

A similar study by Young et al.¹⁵ explored the acceptability of dispensing oral fluid HIV rapid self-tests via a vending machine located in the car park of a gay and lesbian community centre in Los Angeles. Eight Black African and Latino MSM were interviewed and found the intervention to be acceptable, particularly due to the confidentiality and convenience of the method, as seen in this study. Participant in both studies also found the ability to test at home or a private place to be of benefit. Interestingly, a number of participants in the Young paper suggested that the machine should be customised to become a specific 'HIV test kit vending machine' while others suggested the machines should also dispense food and drinks to aid with confidentiality. The vending machine in our study is a bespoke machine, developed purely to dispense HIVST kits. The implications for this were not explored with participants in this study but this would be important to consider locating the vending machines in alternative sites.

This study shows that locating an HIVST vending machine in a sauna is acceptable to MSM attending the venue, consistent with previous research.¹³ While the possible concern about a health intervention encroaching on people's leisure time was raised, the overall benefits of increased accessibility to HIV testing were felt to outweigh this concern by all participants. It is encouraging that participants identified the vending machine as particularly useful for those engaging in higher-risk sexual activity as it is well recognised that those with recent HIV acquisition account for a significant proportion of new HIV infections.¹⁶ The value of the vending machine in increasing HIV testing among this group does have to be carefully balanced with the potential negative impact of MSM using this option as an alternative to comprehensive STI screening, which would normally include other blood-borne virus (BBV) screening as well as chlamydia and gonorrhoea testing. The ability to dispense tests for additional STIs via the vending machines is currently being developed. However, this option is limited at present by the need for laboratory processing of samples which creates additional logistical challenges and detracts from the advantage of anonymity provided by self-testing. The development of new multi-infection self-test could overcome this concern. Similarly, it is essential that

clear information regarding the limitations of HIVST as a risk-assessment tool prior to condomless sex is not only available to but accessed by those using the testing kits. It is fundamental to ensure this intervention does not inadvertently lead to increased sexual risk-taking.

An unanticipated finding from this study was the secondary distribution of testing kits to others. As identified by the participants, only a sub-set of MSM attend the sauna and while some felt able to attend specifically to use the vending machine, others may not feel able to do so. The peer-identification of those at risk of HIV could be effective in accessing a group who do not attend traditional services, thus reducing the pool of undiagnosed infection. It would be valuable to further explore the acceptability of both the offering and acceptance of HIVST kits between peers. However, this benefit is likely to be lost if the HIVST kits are at a cost. While the implication of charging for the HIVST kits was not explored in this study, previous survey data have shown that the ability to test for free significantly influences the decision of MSM to test.¹⁷ If the kits are only available at a cost it is likely to reduce secondary distribution. The secondary distribution of tests and the fact that participants reported saving tests to use at a later date also has implications. No data were collected from participants regarding how long tests were kept before but this finding highlights the need to ensure kits have a long shelf life and that the information provided with each kit explains how to appropriately store the kits and check the expiration date prior to use.

The suggestion of a HIVST vending machine located in the waiting room at the sexual health clinic would also be valuable to explore further. The benefit of reduced waiting times for those seeking an HIV test, as well as increasing capacity for other service users may be profound. It addresses one of the main concerns raised by study participants, that of receiving a positive result without immediate access to appropriate information and support. It also maintains the relationship between the sexual health clinic and HIVST vending machine users which is essential to ensure that screening for other BBVs and bacterial STIs is not neglected. The placement of an HIVST vending machine in the sexual health clinic waiting room was also found to be acceptable in a survey of 193 black, Latin American and other minority ethnic service users in London.¹¹

In summary, HIVST vending machines are an acceptable, innovative way to encourage HIV testing. Providers need to ensure this intervention is supported by adequate information regarding the limitation of the test and how to access comprehensive services to avoid any unintended negative effects.

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Supplemental material

Supplemental material for this article is available online.

References

- Public Health England. HIV in the UK: 2016 report, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/602942/HIV_in_the_UK_report.pdf (2016, accessed 13 June 2019).
- Delpech V, Kirwan P and Brown A. The HIV epidemic: global and United Kingdom trends. *Medicine* 2018; 46: 269–271.
- Public Health England. Progress towards ending the HIV epidemic in the United Kingdom: 2018 report.
- Rodger AJ, Cambino V, Antinori A, et al. Risk of HIV transmission through condomless sex in serodiscordant gay couples with the HIV-positive partner taking suppressive antiretroviral therapy (PARTNER): final results of a multicentre, prospective, observational study. *Lancet* 2019; 393: 2428–2438.
- Public Health England. HIV testing and self-testing: information update, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/821273/Progress_towards_ending_the_HIV_epidemic_in_the_UK.pdf (2015, accessed 1 November 2019).
- Jamil MS, Prestage G, Fairley CK, et al. Effect of availability of HIV self-testing on HIV testing frequency in gay and bisexual men at high risk of infection (FORTH): a waiting-list randomised controlled trial. *Lancet HIV* 2017; 4: e241–e250.
- Katz DA, Golden MR, Hughes JP, et al. HIV self-testing increases HIV testing frequency in high-risk men who have sex with men: a randomized controlled trial. *J Acquir Immune Defic Syndr* 2018; 78: 505–512.
- Krause J, Subklew-Sehume F, Kenyon C, et al. Acceptability of HIV self-testing: a systematic literature review. *BMC Public Health* 2013; 13: 735.
- Pant Pai N, Sharma J, Shivkumar S, et al. Supervised and unsupervised self-testing for HIV in high- and low-risk populations: a systematic review. *PLOS Med* 2013; 10: e1001414.
- Figueroa C, Johnson C, Verster A, et al. Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS Behav* 2015; 19: 1949–1965.
- Lee M, Onyango D, Hamza H, et al. Investigating HIV testing preferences in black, Latin American and other minority ethnicities to inform the co-design of digital vending machines for HIV self-testing kits. In: Poster BHIVA 2019 Bournemouth.
- Elliot E, Rossi M, McCoprack S, et al. Identifying undiagnosed HIV in men who have sex with men (MSM) by offering HIV home sampling via online gay social media: a service evaluation. *Sex Transm Infect* 2016; 92: 470–473.
- Vera JH, Soni S, Pollard A, et al. Acceptability and feasibility of using digital vending machines to deliver HIV self-tests to men who have sex with men. *Sex Transm Infect* 2019; 0: 1–5.
- Ritchie J and Spencer L. Qualitative Data Analysis for Applied Policy Research. In: Huberman AM and Miles MB (eds) *Chapter 9: The Qualitative Researcher's Companion*. 1st ed. London: SAGE Publications; 2002 ISBN 9780761911906.
- Young SD, Daniels J, Chiu CJ, et al. Acceptability of using electronic vending machines to deliver oral rapid HIV self-testing kits: a qualitative study. *PLoS ONE* 2014; 9: e103790.
- Phillips AN, et al. Increased HIV incidence in men who have sex with men despite high levels of ART-induced viral suppression: analysis of an extensively documented epidemic. *PLoS One* 2013; 8: e55312.
- Miners A, Nadarzynski T, Witzel, et al. Preferences for HIV testing services among men who have sex with men in the UK: a discrete choice experiment. *PLoS Med*. Epub ahead of print 11 April 2019. DOI: 10.1371/journal.pmed.1002779.