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## Rapid HIV Testing: A Literature Review

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### 1 Summary

Rapid HIV testing (RHT) is not widely used in Australia. This literature review examined research and evaluation studies conducted in developed world contexts to inform the AFAO Rapid HIV Testing Policy Reference Group (PRG). The key findings of the review were:

- RHT programs typically aim to i) increase the uptake of HIV testing among at-risk populations, ii) increase the proportion of those tested who receive their results, iii) reduce the number of undiagnosed infections and iv) improve the consumer experience of HIV testing.
  - In the developed world, RHT has most commonly been implemented in sexual health or clinical settings, but there have been a number of studies demonstrating the successful implementation of RHT in community settings and through outreach. There is a dearth of studies investigating the implementation of RHT in general practice settings.
  - The most significant issues identified in the implementation of RHT appear to be i) adapting voluntary counselling and testing procedures to accommodate the shorter contact time spent with clients, ii) deciding how to report back reactive test results if confirmatory testing cannot be conducted on-site, and iii) monitoring and maintaining the quality and reliability of counselling and testing services, particularly in contexts where HIV testing has not been previously delivered.
  - Consumer reactions to RHT are overwhelmingly positive, with consumers valuing the speed with which results can be obtained, the reduction in anxiety associated with waiting for standard test results, and the option to provide samples using a less invasive collection method e.g. finger prick or oral fluid. A minority of consumers describe concerns about the accuracy of RHT compared with standard HIV testing.
  - Studies evaluating the impact of RHT programs typically show beneficial effects, such as i) the successful engagement of hard-to-reach and at-risk populations, ii) increases in the number of people presenting for HIV testing, iii) reduction in the time taken to deliver results, iv) increases in the proportion of people receiving their results, v) identification of previously undiagnosed infections and vi) increases in the proportion of newly diagnosed HIV-positive people referred into treatment and care. It should be noted that many of these beneficial effects were demonstrated in the USA, where there are traditionally low levels of return for HIV test results.
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## 2 Definitions

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Rapid HIV testing is an alternative to standard HIV testing in which the results of a test for HIV antibodies can be ascertained quickly, often within 30 minutes (Franco-Paredes, Tellez & del Rio, 2006). Standard HIV testing, typically involving an enzyme-linked immunosorbent assay (ELISA) followed by a Western blot procedure to confirm or reject suspected positive results, usually takes at least a few days (and often a week) because samples are processed by a lab and tested in batches. Standard HIV testing usually requires a venous blood sample to be drawn while some rapid HIV tests can be conducted on an oral swab or blood from a finger prick (and are therefore regarded as less invasive). Rapid HIV tests can be conducted 'on site' by someone with training rather than sending samples to a testing facility. For this reason, rapid HIV testing is sometimes referred to as 'point-of-care' testing (e.g. Kendrick, Kroc, Couture & Weinstein, 2004). It is less commonly referred to as 'short-incubation' testing (Australian Government, 2006).

The accuracy of HIV tests is assessed by *sensitivity* and *specificity*. Sensitivity refers to the likelihood of the test returning a positive result when HIV is present. Specificity refers to the likelihood of the test returning a negative result if HIV is not present. Both sensitivity and specificity are usually expressed as percentages e.g. 98% sensitivity means that 98 times out of a 100 the test will return a positive result in samples containing HIV. Another term used in relation to HIV antibody tests is *positive predictive value*, which refers to the proportion of patients who are HIV positive who are correctly diagnosed by a given HIV test.

In Australia, all HIV tests are regulated and approved by the Therapeutic Goods Administration (TGA). Rapid HIV tests currently listed on the TGA's product register as approved for use in Australia include Determine HIV-1/2, Multispot HIV-1/HIV-2 and Serodia HIV, although it is unclear how often or in which contexts these tests are used (this is being followed up by the PRG).

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## 3 Scope

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This review was commissioned to assist the AFAO Rapid HIV Testing Policy Reference Group. The reference group was formed to provide advice to the AFAO Board about the feasibility and desirability of making rapid HIV testing more available in Australia. This review therefore considers published research and technical reports detailing the roll-out of RHT in other jurisdictions, considering in particular the aims of RHT programs, barriers and incentives to rapid HIV testing, and consumer experiences and outcomes of RHT. The review has tried to focus on RHT with population groups similar to those most affected by HIV in Australia and in settings where RHT is most likely to be trialled in Australia e.g. in clinical settings, community settings, commercial venues and metropolitan areas. Unfortunately, the literature is limited or nonexistent for some of these populations and settings e.g. RHT with indigenous populations. It should also be noted that, given its restricted scope, this review has not engaged with the use of RHT in resource-poor settings or countries in the developing world (see World Health Organization, 2004).

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## 4 Aims of rapid HIV testing programs

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The aims of rapid HIV testing programs vary according to the settings in which they are deployed. For instance, in populations with low HIV testing rates but a high population prevalence of HIV, the primary aim of RHT may be to reduce the number of people who do not know their HIV status and, in particular, identify HIV-positive people so they can access care and support services (Franco-Paredes, Tellez & del Rio, 2006; Rotheram-Borus, Leibowitz & Etzel, 2006). In contexts where a high proportion of people who present for standard testing do not return to collect their results (such as the USA), the aim of RHT is to increase the proportion of people

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who receive their HIV test results (Galvan, Brooks & Leibowitz, 2004; Grusky et al, 2007). In populations with high rates of HIV testing, the aim of RHT may be to make HIV testing more accessible and attractive (particularly to those who engage in high-risk practices) or to increase patient choice (Forsyth et al, 2008; Rotherham-Borus, Leibowitz & Etzel, 2006). It is assumed that if more undiagnosed people know their HIV status, and if those who test infrequently test more regularly (increasing the chance of catching new diagnoses), then HIV transmission will be reduced (Franco-Paredes, Tellez & del Rio, 2006).

In the USA, rapid HIV testing has gained prominence because of the increased emphasis placed on HIV testing by the Centers for Disease Control and Prevention within its HIV Prevention Initiative (Franco-Paredes, Tellez & del Rio, 2006). Encouraging uptake of RHT within non-traditional testing environments and a move towards routine testing<sup>1</sup> within healthcare settings appear to be part of this initiative (Aguirre et al, 2007; Branson et al, 2006). Some proponents of RHT in the USA suggest 'taking advantage' of clinical populations, such as emergency department attendees or women in delivery/maternity wards, to increase levels of testing among those who may not access primary care regularly or who have never been tested (Torres & Greising, 2006). Other American researchers have suggested that the significant costs associated with standard HIV testing may be reduced by increasing the proportion of rapid HIV testing within traditional testing and counselling programs (Rotherham-Borus, Leibowitz & Etzel, 2006). However, some trials suggest that RHT programs can require significant resourcing, particularly when using combined counselling, clinical and outreach teams to encourage testing among vulnerable populations (Buchér et al, 2007).

In Britain, the National Strategy for Sexual Health and HIV aimed to increase HIV testing among first-time sexual health clinic attendees by 60% and to reduce the number of undiagnosed infections by 50%. Rapid HIV testing has been suggested as a way to make HIV testing more attractive to clinic attendees (Forsyth et al, 2008) and is available in some genito-urinary medicine (GUM) clinics, NHS walk-in centres and community-based services, such as the Terrence Higgins Trust's fasTest service. The fasTest service has targeted gay and bisexual men and African migrants, aiming to reduce levels of undiagnosed infections, provide greater access to and choice in testing, deliver results quickly in community settings and refer people rapidly into care if diagnosed positive (Weatherburn et al, 2006). Rapid testing has also been considered as a way to make HIV testing more accessible to specific 'at-risk' populations in the UK by making RHT available in non-clinical settings such as gay social and sexual venues (Prost et al, 2007). Greater availability of RHT has also been suggested as a way to reduce the average time between HIV infection and diagnosis in the UK (Dodds & Weatherburn, 2007), although a community trial of RHT did not show an improvement in early diagnosis rates (Weatherburn et al, 2006).

In New Zealand, rapid HIV testing was trialled by the New Zealand AIDS Foundation outside of clinical settings (Smythe, 2007). The service aimed to reduce the cost of HIV testing to the consumer, make testing more convenient, reduce waiting times and offer a level of anonymity not usually available at traditional testing services. The trial also aimed to see how RHT could incorporate both a risk assessment process and health promotion messages.

Canada has been considering the wider use of rapid HIV testing, although a review suggests some reservations about whether RHT will significantly boost HIV testing rates, how acceptable standards of pre- and post-test counselling will be maintained, and how to ensure confirmatory testing is accessible and carried out quickly (Elliott & Jürgens, 2000).

In Australia, the current National HIV Testing Policy takes a conservative approach to rapid HIV testing, stating that 'Short-incubation testing does not necessarily mean easy testing' (p. 50, Australian Government, 2006). The policy emphasises the need for adequate training to accurately interpret test results, and the risks of not obtaining informed consent or delivering false positive results. For these reasons, the policy suggests RHT should be used primarily by doctors to support clinical decision-making during critical incidents (including occupational exposures and emergency surgery). The current Australian policy does not recommend or endorse

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<sup>1</sup> 'Routine testing' refers to the policy of healthcare providers routinely offering HIV testing to all their patients, regardless of sexual history, risk practice or reason for presenting for care. The primary aim of routine testing is to reduce the number of undiagnosed infections in a population. It is sometimes referred to as 'opt-out' testing.

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the use of RHT in other settings, although it appears to allow leeway for trained staff to administer RHT outside of clinical settings.

## 5 Targeting of different populations

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There have been concerns about the use of rapid HIV testing in low prevalence populations, given that early rapid tests had lower specificities than standard HIV tests, increasing the chance of false positive results. For this reason, RHT has often been targeted at high prevalence populations such as attendees at sexual health clinics, gay men and other men who have sex with men, injecting drug users and migrants from high prevalence countries (Dodds & Weatherburn, 2007; Forysth et al, 2008). For instance, the Terrence Higgins Trust's fasTest service at community clinics across the UK targets gay and bisexual men and African migrant populations (Weatherburn et al, 2006).

Many studies have implemented rapid HIV testing in clinical populations already seeking standard HIV testing, such as sexual health clinic attendees (e.g. Kassler et al, 1997; San Antonio-Gaddy et al, 2006). A US study comparing different settings suggests RHT may be more acceptable among sexual health clinic attendees than other populations (Kendrick et al, 2004).

Rapid HIV testing may be more appealing and accessible to difficult-to-reach, at-risk populations who normally do not seek care, particularly when it is offered outside clinical environments. For example, a trial in San Francisco of RHT in homeless shelters, hostels and free meal programs successfully targeted homeless people who were primarily male and African American (Buchér et al, 2007).

Rapid HIV testing has been used to target gay and other men who have sex with men (MSM) outside of clinical environments. A number of studies have considered how RHT can be offered to men attending gay sex venues, to broaden the range of sites at which HIV testing occurs, and better target sexually adventurous men or men with concurrent sex partners (Huebner et al, in press; Prost et al, 2007; Spielberg et al, 2003b). RHT has also been used by community organisations in the UK, the Netherlands and New Zealand to target gay and other MSM outside of traditional testing environments (Koevoets & van Loon, 2004; Smythe, 2007; Weatherburn et al, 2006).

## 6 Implementation in different settings

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A variety of studies have been conducted assessing the feasibility of using rapid HIV testing in different settings. Most of these studies tend to show that it is feasible to deploy RHT, although there can be variable levels of acceptability in different client settings and among different client groups. For instance, a feasibility study looking at the use of RHT in a STD clinic, emergency department and correctional facility found that it was possible to conduct RHT effectively in all three settings, but that the level of acceptability and uptake was highest in the STD clinic and lowest in the emergency department (Kendrick et al, 2004). The subsections below focus on studies where sufficient detail of procedures was provided to illustrate some of the ways in which RHT may be implemented in different settings.

### Clinical settings

Rapid HIV testing has been most commonly trialled in clinical settings, particularly sites already offering HIV testing, such as sexual health clinics. Although it has been suggested that RHT be offered by general practitioners (Rotherham-Borus, Leibowitz & Etzel, 2006), this review could find no examples of RHT being offered in GP settings.

Many early trials of rapid HIV testing were conducted at sexual health clinics. For instance, a 3-month trial of the Single Use Diagnostic System HIV-1 assay (the first rapid test approved in the USA) was conducted at two clinics in Dallas, Texas in 1993 (Kassler et al, 1997). As has become something of a standard feature of RHT in

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the USA, the clinics had to vary their testing procedures to accommodate RHT. In standard testing, clients typically receive a risk assessment, give consent and then participate in pre- and post-test counselling (now often referred to as pre- and post-test discussions; see Australian Government, 2006). In Dallas, the gap between pre- and post-test counselling (when results were delivered) was around two weeks. During the Dallas trial of RHT, both clinics maintained risk assessment and consent procedures, but then varied their counselling procedures. One of the clinics (a STD clinic) only provided counselling when the rapid test results were delivered (i.e. after the test) while the other clinic (an anonymous test clinic) provided counselling between the blood sample being taken and the rapid test results being delivered.

The other variation to standard HIV test procedures in the Dallas trial was the way that reactive test results were handled. Nonreactive rapid test results are typically reported back to the client as HIV-negative and no further testing is done. However, how to handle positive results from rapid tests is a major issue identified in trials. In standard HIV testing, consumers are not given a positive result unless the results of both ELISA and a confirmatory test agree that HIV antibodies are present. The delay afforded by laboratory testing allows for confirmatory tests and makes sure clinicians can rule out false positives before delivering a positive result (Franco-Paredes, Tellez & del Rio, 2006). In RHT, a positive result from a rapid test kit is likely to indicate HIV-positive status but ideally should be confirmed by a Western blot or another procedure. This may require the consumer to provide a new blood sample to be sent to the lab for confirmatory testing (particularly if the original sample was not blood). This means that the consumer, after perhaps expecting a definitive answer about their HIV status in a short period of time, may have to wait for days for their HIV status to be confirmed.

In the Dallas trial, reactive rapid test results were labelled as 'preliminary positive' and clients were told that they 'likely to be infected' or that they had 'a good chance of being infected' in the anonymous clinic (where the positive predictive value had been found to be 81%) and that they were 'probably infected' or 'very likely infected' in the STD clinic where the positive predictive value was 88% (p.1047, Kassler et al, 1997). After being given a preliminary positive result, clients were then asked to make an additional appointment to receive confirmatory results from the Western blot procedure. This second appointment could be up to two weeks later.

Telling clients who get a nonreactive rapid test result that they are HIV-negative while giving a 'preliminary positive' to those who get a reactive RHT result appears to have become the standard procedure in the US and elsewhere (e.g. Kendrick et al, 2004; Liang et al, 2005; San Antonio-Gaddy et al, 2006; Sullivan, 2005; Weatherburn et al, 2006).

An alternative to sending preliminary positive clients for confirmatory testing is described in a recent review of rapid HIV tests (Sullivan, 2005). This reports that the US Centers for Disease Control and the World Health Organisation have developed a reliable alternative to Western blot for confirmatory testing in which a testing algorithm is used involving a series of two or three rapid HIV tests. Recent conference presentations report the successful use of rapid testing algorithms (using two or three rapid tests) to confirm positive test results (or identify false positives) before clients leave the testing site (Constantine et al, 2007; Rurangirwa et al, 2008). This can reduce the anxiety of waiting for a confirmatory test result and increase the proportion of newly diagnosed HIV-positive clients being referred into specialist care and treatment.

Considering other clinical settings, a US study comparing the use of rapid testing in different environments included an emergency department as a testing site (Kendrick et al, 2004). Eligible adults who were not in a critical condition were approached by study staff after emergency department registration or at the bedside. It is not clear how the privacy or confidentiality of patients was protected, or how the study team ensured that patients were not coerced into testing. Perhaps unsurprisingly, only 29% of patients who were approached consented to RHT. Despite this, the authors described the RHT process as 'logistically feasible and surprisingly smooth' (p. 2208), and reported that the emergency department setting produced the greatest number of new diagnoses, compared with a STD clinic and correctional facility (see Outcomes below).

A number of other studies have considered the implementation of rapid HIV testing in emergency departments (Haukoo, Hopkins & Byyny, 2008), dental clinics (Dietz et al, 2008) and maternity departments (Rahangdale et al, 2008; Stokes, McMaster & Ismail, 2007).

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## Community and non-clinical settings

Because rapid HIV testing kits are more easily administered and do not necessarily require a specialist lab to deliver results, there has been considerable interest in the deployment of RHT in non-traditional HIV testing environments. It has been suggested that HIV testing could be offered in a range of community and non-clinical settings (Aguirre et al, 2007; Galvan, Brooks & Leibowitz, 2004; Kendrick et al, 2004; Rotherham-Borus, Leibowitz & Etzel, 2006; San Antonio-Gaddy, et al 2006). Suggested settings include:

- bars
- community-based organisations
- correctional facilities
- hostels and homeless shelters
- mobile vans
- needle and syringe programs
- sex-on-premises venues

This review could not identify published examples of rapid testing being offered in bars or similar commercial venues. Examples of RHT being delivered in community and non-clinical settings are described below.

The Terrence Higgins Trust (a community based organisation) has made rapid HIV testing available in drop-in clinics across the UK as an alternative to genito-urinary medicine (GUM) clinics. The clinics offer a range of sexual health testing including RHT, branded as fasTest. RHT in particular was targeted at priority populations, particularly gay and bisexual men and migrants from high prevalence African countries (Weatherburn et al, 2006). The clinics often operate with the support of a local GUM clinic, so that there is clinical support and training for RHT, confirmatory testing can be undertaken in a specialist lab, and those who are diagnosed HIV-positive can be quickly referred into HIV care. The evaluation team noted that the relationships between fasTest services and GUM clinics can be 'challenging partnerships to establish and maintain, especially where the service requires one collaboration to provide fasTest and another to receive positive referrals' (p. 1). The authors conclude that strong leadership is required to maintain this kind of collaboration.

The HIV Association Netherlands set up a one-hour, rapid HIV testing service in Amsterdam, called Checkpoint, to encourage gay men and heterosexual men and women to learn their serostatus (Koevoets & van Loon, 2004). The service was staffed by volunteer doctors, used the Abbott Determine HIV-1/2 test, and offered pre- and post-counselling. Reactive rapid test results were confirmed with ELISA and Western blot, although it is unclear how preliminary positive results were delivered or followed up. The Checkpoint service was open every Friday night and took bookings for HIV tests. The authors reported that the service was fully booked with minimal advertising.

The New Zealand AIDS Foundation trialled the use of rapid HIV testing at its Burnett Centre in Auckland (Smythe, 2007). The Centre already offered standard HIV testing. The service was aimed at men who have sex with men and was advertised extensively in print media, online and through outreach at gay venues. Clients presenting for testing were asked to fill in a risk assessment form before having a pre-test discussion with a counsellor. The service used the Uni-Gold finger prick rapid test, which could deliver results in 20 minutes. After the result a brief post-test discussion was held. Every person who presented for testing was asked to complete an evaluation form.

In Canada, Toronto's Hassle Free Clinic, an anonymous testing centre, introduced rapid HIV testing as an alternative to standard testing in 2001 and evaluated its impact (Guenter et al, 2008). The Fast-Check HIV-1/2 rapid test was used on finger prick blood. Patients presenting for HIV testing received an information sheet on both standard and rapid testing in the waiting room. The differences between the two tests was also discussed during pre-test counselling and then the patient chose one of the tests and was invited to take part in the evaluation study. Test specimens were collected and the patient was given a numeric identifying code. Patients who had negative rapid test results were asked to fill in a questionnaire (if they had consented) at their post-test discussion. Patients with a positive test result were invited to a follow-up interview. After five months the study was terminated because the licence for the Fast-Check test was withdrawn by Health Canada after concerns

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about its reliability. Those who had undergone rapid testing could not be traced because they were anonymous, but advertising was used to encourage participants to return for standard testing.

A US study comparing the roll-out of rapid HIV testing in different settings (Kendrick et al, 2004) included a correctional facility for female detainees where HIV testing had not been offered before. The facility processes 15,000 female detainees a year, half of whom are released within 3 days. RHT was offered to detainees by the study team within the intake area of the facility, in open view of correctional officers, before standard medical screening took place. Those with reactive test results were given them in a 'confidential area' (no additional details supplied). The authors reported that less than half of the eligible detainees consented to be tested, and noted that 'strong administrative support' was needed 'to ensure cooperation from the medical and security staffs' (p 2209). Given that the detainees were a confined audience, it is unclear from the description of the study whether adequate precautions were taken to protect participants from coercion into testing or to ensure their confidentiality. The authors also reported that few jail participants who tested positive gained access to HIV care after the study.

Rapid HIV testing was trialled for 8 months at shelters, free meal programs and hostels used by homeless people in San Francisco (Buchér et al, 2007). This population is known to have a high HIV prevalence of around 11%. Underlining how community-based testing can be labour-intensive, the study used a team of counsellors, a coordinator, intake and discharge staff and staff trained to take blood or administer a rapid HIV test (OraQuick). This team visited venues, undertook recruitment, delivered pre- and post-test counselling, administered the rapid test and referred individuals with reactive test results for confirmatory testing. Given that recruitment often took place in relatively open venues, participants who consented to be tested were given a unique, anonymous code and were given an appointment to be tested the Monday after recruitment. Testing took place in a confidential space, if the shelter, meal line or hostel had such a place, or a 'community research site' (no additional details provided). The authors noted that participants seemed to prefer testing at the site where they were recruited rather than going to an unfamiliar location. Participants received a cash incentive (US\$15) for attending rapid testing and for collecting confirmatory results, if necessary.

Rapid HIV testing using OraQuick was also introduced on a mobile van testing service operated in Baltimore (Liang et al, 2005). The van was staffed by a nurse, phlebotomist, health educators and outreach workers and visited locations frequented by populations who report high levels of sexually transmitted infections, drug use and commercial sex work. The majority of these clients were male and African American. Clients either walked in to the van off the street or were recruited by an outreach worker. All received pre-test counselling and a choice of standard or rapid testing. Rapid test results were delivered within 10 minutes. Clients were told that non-reactive results indicated they were HIV-negative. Reactive results were described as 'preliminary positive' and clients were referred to a STD clinic for confirmatory testing (results were delivered within 7-10 days). Clients testing positive were followed up for 4 weeks after testing (to monitor uptake of HIV care), although it is unclear whether this was standard practice or a temporary feature of the research study. A similar mobile service is offered in Chicago (AIDS Alert, 2005).

A summary article in *Morbidity and Mortality Weekly Report* describes how eight community-based organisations in seven US cities undertook a rapid HIV testing demonstration project funded by the US Centers for Disease Control and Prevention (Aguirre et al, 2007). The CBOs identified a range of locations where persons judged to be at high risk congregated, particularly low income Americans from racial/ethnic minority populations e.g. parks, shelters, hotels, needle exchange programs and community clinics. Trained staff members offered RHT to clients from either mobile testing units or inside venues. Participants had to meet eligibility criteria specific to each state (e.g. age of consent) and provide written consent. Details of pre- or post-test counselling are not provided. Two types of rapid test were used (OraQuick Rapid HIV-1 or OraQuick Advance Rapid HIV-1/2) on either oral fluid or whole blood samples. Results were provided within 20-40 minutes. People with reactive test results were given a preliminary positive result, asked to provide an additional sample for confirmatory testing and asked to make a follow-up appointment. HIV positive clients who received confirmatory results were referred to clinics for HIV care.

Sex-on-premises venues frequented by gay men and other men who have sex with men (MSM) have been trialled as sites for rapid HIV testing, particularly in the USA. In Seattle, following a survey of gay bathhouse

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patrons, a rapid testing program was developed to make HIV testing more accessible to MSM in the venues (Spielberg et al, 2003b). The program built on an existing bathhouse outreach program operated by the Lifelong AIDS Alliance in collaboration with venue owners and researchers. As a result of this collaboration, standard testing was already offered at three venues on one or two nights a week. A study was conducted to guide the introduction of rapid testing in the venues after the first rapid test, the Single Use Diagnostic System for HIV-1, was approved in the USA. The existing collaboration was built on, bringing in test laboratory staff to advise on the use of RHT. When the study started, a recruiter was employed to offer testing to patrons within the bathhouse, approaching patrons directly. Patrons who were eligible and consented to be tested could opt to remain anonymous, could choose between standard and rapid testing, and were given pre-test counselling in a private room (which, the authors noted, may not be available in all venues). To perform rapid tests in the venues, two staff set up a centrifuge in the same room used for counselling, and put blood samples in the centrifuge while pre-test counselling was conducted. The authors note that more recent, less invasive rapid tests using finger pricks or oral swabs would be considerably easier to administer in venues and should increase acceptability. Counselling took 20 minutes, then the patron was asked to leave for 10 minutes while the rapid test was conducted. Patrons were told that if the result was positive, staff would escort them to a safe place of their choice for additional counselling. If there was a reactive test result, additional blood samples were sought for confirmatory testing. Confirmatory results were made available within 3 days.

In another US study conducted in 2004, rapid HIV testing was trialled in a gay bathhouse that had been previously offering standard HIV testing (Huebner et al, in press). An outreach worker actively recruited patrons for testing as they passed through the testing areas, and fliers and posters announcing the program were posted in the venue. Announcements were also made through the venue's public address system and television screens. Men who approached the testing staff had the testing procedure explained and were also asked whether they would participate in the evaluation. Those who agreed to both were interviewed for the evaluation before they had pre-test counselling. For rapid testing, the procedure used in standard pre-test counselling was modified so that risk assessment and risk reduction counselling occurred while the test sample was processed. The OraQuick rapid finger-stick test was used in the study and results were available within 20 minutes. Testing for syphilis, gonorrhoea and chlamydia was also available during the study. HIV testing was conducted anonymously (STI testing was confidential). Those who had a reactive rapid test were given a preliminary positive result and were referred for confirmatory testing. It is not clear from the article how those testing positive were followed up.

### Issues in implementation

A range of issues have been identified that may need to be considered when deploying rapid HIV testing, or that may result from its implementation in different settings. Recent reviews summarise many of the following issues (Elliott & Jürgens, 2000; Galvan, Brooks & Leibowitz, 2004):

- Pressure on consumers to undertake HIV testing.  
The availability of rapid testing may increase the pressure on consumers to undertake HIV testing when they are unprepared to learn their HIV status or ill informed about the test procedure (see also Rotherham-Borus, Leibowitz & Etzel, 2006). If pre-test discussions are shortened to fit within a RHT procedure, it is important that clients continue to understand the implications of undertaking a test and are free to give or withhold consent (Australian Government, 2006).
- Confidential vs. anonymous testing.  
Given that rapid test results can usually be delivered within a single service session, RHT may make it easier for some services to offer anonymous testing. This may make testing more attractive to stigmatised groups (such as injecting drug users) who may not wish to participate in confidential testing (in which some identifying details are collected by the testing personnel). Unfortunately, anonymous testing makes it considerably more difficult to follow up clients, particularly those who test positive but do not return for confirmatory tests.

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- Reduction in time for counselling or discussion.

The faster process of rapid testing can reduce the opportunity for clinical or counselling staff to talk to clients, identify risk practices and gaps in knowledge and discuss safe sex practices (although we should bear in mind that extensive pre- and post-test discussions may not consistently occur in existing settings offering HIV testing). Some have suggested alternatives to traditional one-on-one pre- and post-test discussions for RHT, including leaflets, videos and telephone counselling (Rotheram-Borus, Leibowitz & Etzel, 2006). Although reductions in face-to-face discussion reflect a broader shift toward less intensive pre-test discussions rather than in-depth counselling during HIV testing (e.g. Australian Government, 2006), some may feel RHT reduces opportunities for HIV education and prevention.
  - Confirming reactive rapid test results.

As is discussed earlier in the *Implementation* section, how to describe reactive test results to clients and confirm those results is a major issue in RHT. Most studies in the US and elsewhere describe reactive test results as 'preliminary positive' to consumers and then suggest standard confirmatory testing by a lab (which generates a delay before consumers find out whether they are HIV positive or not). An alternative, not yet widely seen in developed world contexts, is to use a number of rapid tests in sequence (guided by a testing algorithm) to confirm positive results (Constantine et al, 2007; Rurangirwa et al, 2008; Sullivan, 2005).
  - Alternative uses of RHT by consumers.

It has been suggested that rapid testing may be 'misused as a prevention tool' by 'high-risk' consumers who 'use HIV testing as their only prevention activity' (p. 17, Galvan, Brooks & Leibowitz, 2004). There is a concern that people who engage in regular high-risk activity may use RHT as a way to justify ongoing unsafe practices. What is not acknowledged, however, is the capacity of RHT to make risk reduction practices (e.g. negotiated safety) safer and easier to maintain, or that increasing testing rates among those engaged in high risk activity is still a beneficial public health outcome. The effects of RHT on consumers' perceptions of HIV risk or creative uses of RHT do not appear to have been investigated so far.
  - Training & supervision.

The implementation of rapid testing requires the training and supervision of staff in new procedures. This requires commitment and resourcing within organisations, particularly those without a previous track record in delivering HIV testing. Staff trained in standard testing procedures may find the introduction of RHT stressful, particularly when learning how to deliver 'preliminary positive' results if confirmatory testing cannot be done immediately on-site (Kassler et al, 1997), although ongoing experience with RHT appears to reduce staff anxieties about rapid test procedures (San Antonio-Gaddy et al, 2006). Ongoing staff support and training is necessary to maintain quality in RHT services (see Grusky et al, 2007).
  - Effects of RHT on existing resources.

Many services may be unable to deliver RHT without additional resources. US studies find that RHT provision is relatively rare by community-based organisations (Bogart et al, 2008) and that services that did not offer RHT reported significant barriers to implementing rapid testing (Bogart et al, in press). These included the difficulty in learning new testing protocols, how to maintain quality assurance procedures and complying with state and federal regulatory requirements. When RHT is implemented, a sudden upsurge in demand for HIV testing, the need to train staff in different procedures, maintaining quality control procedures and the need to redeploy counselling, clinical or outreach personnel to offer RHT may all put pressure on existing services.
  - Reliability of rapid HIV testing.

There have been some cases where the reliability of rapid HIV tests has been called into question and public health authorities have had to intervene to maintain the accuracy of public HIV testing procedures. The first rapid HIV test to be approved for use in Canada, Fast-Check HIV-1/2, was withdrawn from use
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after 2 years by Health Canada after problems with its performance (Guenter et al, 2008). In New York City, an unexpected upsurge in false positives from rapid HIV tests caused local authorities to change RHT procedures (Cummiskey et al, 2008). Due to its popularity with consumers, in 2005 10 walk-in STD clinics in NYC switched from finger prick to oral fluid rapid testing using the OraQuick Advance Rapid HIV-1/2 Antibody test. Shortly afterwards a cluster of false positives emerged causing the temporary suspension of oral fluid testing and a decision to immediately follow up all reactive oral fluid test results with a finger prick rapid test. Another cluster of false positives from oral fluid testing occurred in 2007, necessitating a return to finger prick blood testing only. It is still unclear why the accuracy of the oral fluid tests dropped. Although the falls in oral fluid test specificity were modest (from 99.8% to 99.03%), with the large number of clients being tested in these clinics (over 60,000 in 2007) a drop in accuracy produced a significant increase in false positives and required an immediate response.

## 7 Consumer views of rapid HIV testing

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A number of studies have considered the acceptability or desirability of rapid HIV testing to consumers traditionally targeted for HIV testing, and in particular whether consumers would prefer RHT over standard HIV testing. Given traditional barriers to testing (such as fear of results and anxiety about waiting for standard test results), these studies usually find that RHT is preferred over standard testing. A small number of studies find that levels of acceptability and uptake of RHT may vary according to setting and population group.

Consumer reactions to rapid HIV testing have also been recorded in studies where RHT has been trialled or implemented. Most of these studies find high levels of satisfaction with RHT and a preference for rapid testing among those who have previously had a standard test for HIV.

Details of feasibility/acceptability studies and evaluations of consumer reactions to rapid testing are given in the next two subsections.

### Feasibility/acceptability studies

In a British survey of sexual health clinic attendees the most common reasons given for declining a standard HIV test were perceiving oneself to be at low risk, having had a negative test within the last year and fear of the result (Forsyth et al, 2008). Over half of those who declined standard testing said they would be more likely to take a test if a rapid HIV test was available. Fear of test results and the inability to deal with a positive result were the most commonly cited barriers to HIV testing in a US survey of STD clinic and needle exchange clients and gay sex venue patrons (Spielberg et al, 2003a).

A British qualitative study considered the feasibility of delivering rapid HIV testing in gay social and sexual venues e.g. gay bars, clubs and saunas (Prost et al, 2007). Participants were a small number of gay men, gay venue owners and a service provider. Concerns were expressed about maintaining adequate privacy and confidentiality in venues, the potential stigma of being seen to take a test, the inappropriate intrusion of a clinical procedure into a sexual or nightlife setting, the effects of alcohol and drugs on patrons' ability to make decisions about testing, and how positive results could be sensitively delivered. Participants also wanted to know how patrons would be followed up (particularly if they tested positive) and how appropriate hygiene standards would be ensured to support RHT in venues. In the findings there was a suggestion (not highlighted by the authors) that participants thought it would be more acceptable for 'low risk' gay men to use rapid testing in venues compared with men who might use rapid tests to guide decisions about unprotected sex. To offset concerns about privacy, it was suggested that RHT might be integrated into a more general health service that could visit venues, or that outreach workers could make appointments for testing with patrons that would be conducted at an external clinic rather than conduct RHT in venues.

A Seattle study comparing clients of a needle exchange, STD clinic and gay sex venues (Spielberg et al, 2003a) found that all groups preferred rapid HIV tests over standard tests. While similar proportions of all client groups (between a quarter and a third) said they would prefer to access rapid testing in a clinic, clients of gay sex venues were more likely to say they would like to use a rapid test at home, and needle exchange clients were

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more likely to say they would like to use urine testing. RHT was preferred because faster results were seen to produce less anxiety.

106 injecting drug users in five cities in Brazil were interviewed about their HIV, sexual health and their perceptions of different types of HIV test, including rapid testing (Telles-Dias et al, 2007). Cocaine is the primary drug of choice of Brazilian injecting drug users (IDUs), and IDUs are characterised by a high frequency of injection, high rates of partner change and unprotected sex, and high levels of paid sex work or exchanging sex for drugs. Participants expressed a preference for rapid HIV tests over standard tests, citing speed and reduced anxiety while waiting for results as primary reasons. Sample collection methods not involving venous blood draw (such as saliva or finger prick) were also preferred, with participants saying this would be advantageous, particularly for those with damaged veins due to drug injection. A small number of participants expressed concerns about the reliability of rapid tests (e.g. 'How can it be reliable if the results are delivered that fast?') and thought blood testing would be more reliable than testing saliva. Most participants said they would prefer to undertake a rapid test in a health care facility or community clinic, although some had concerns about privacy if they sought testing in their local neighbourhood. The authors concluded that RHT is feasible among IDU, but that concerns about the reliability of tests need to be addressed through education and RHT needs to be offered in such a way that IDU can maintain their anonymity or confidentiality.

### Evaluation of rapid testing in practice

In a Dallas trial of rapid HIV testing, the vast majority of clients (90%) liked receiving their results on the same day, and 89% said they understood the test results. 88% of clinic attendees who had been previously tested for HIV said they preferred the rapid test (Kassler et al, 1997).

A large-scale evaluation study of rapid HIV testing was conducted in New York State's publicly funded Anonymous HIV Counseling and Testing Program (San Antonio-Gaddy et al, 2006). The program offers rapid HIV testing (using finger-stick blood specimens) in a range of community and correctional settings and 61 testing sites took part in the evaluation study. In a survey of preferences for testing, 96.5% of clients selected rapid testing over conventional testing. The most commonly cited reason for preferring rapid testing was wanting to get the results on the same day. Of the minority who opted for oral fluid or standard testing, the most commonly given reason for the former was not liking needles and for the latter believing that standard blood testing was more accurate. Despite the overwhelming preference for rapid tests, over two-thirds of respondents said it was important to have a choice of testing methods (no explanation was provided for this view).

A study comparing rapid HIV testing acceptability and uptake at a STD clinic, emergency department and correctional facility (Kendrick et al, 2004) found that an offer of RHT was most likely to be taken up by patients at the STD clinic (69%), followed by inmates at the correctional facility (46%) and patients in the emergency department (29%).

Another US study looked at the acceptability of rapid HIV testing in an urban public hospital in Atlanta (Hutchinson et al, 2004). Focus groups were conducted during trials of standard and rapid testing in the hospital's urgent care centre, a walk-in medical clinic where the patient population is primarily African American, on low incomes and uninsured. Focus groups were single sex, and grouped together people who had undergone standard testing, rapid testing or had refused testing. Fear was the greatest single reason given for not accepting a HIV test. Waiting for test results was also seen as inconvenient (particularly for standard tests), but interestingly some said they refused *rapid* testing because they had already been waiting a long time in the clinic (the authors noted that consenting to rapid testing extended a patient's clinic visit by at least 2 hours). As one participant put it, 'The rapid test was excellent, even though it wasn't *rapid*' (p. 109). Among those who were tested, the rapid test was overwhelmingly preferred to the standard HIV test, primarily because the short turnaround time was seen to reduce stress and lessen the chance of losing one's resolve to return for results. Among those who had experienced both standard and rapid testing, there were some concerns about the accuracy of RHT (the authors suggest this should be addressed more clearly in pre-test discussions). Although most participants supported the notion of routine testing (i.e. doctors routinely offering HIV tests to clinic patients), one woman (out of 42 participants) reported feeling pressured to take an HIV test by her doctor. Although they were not offered during the trial, participants felt that less invasive saliva or finger-prick rapid tests would be preferable to those requiring blood to be drawn.

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The Terrence Higgins Trust's fasTest service, that offers rapid HIV testing in community clinics across the UK, commissioned an evaluation of four of its testing sites in London, Brighton and Birmingham (Weatherburn et al, 2006). Over 900 people completed an evaluation questionnaire. Over a third of respondents at the fasTest services had not been tested for HIV before. Commonly cited reasons for not testing included fear and not knowing where to get tested. Being able to receive results on the same day and convenience (the fasTest clinics operated outside normal business hours) were both cited as common reasons among all participants for seeking RHT at the services. A third of the people who were diagnosed as HIV positive during the evaluation period were interviewed about their experience of the fasTest service. Most reported high levels of satisfaction with the service and their referrals into HIV care.

In the Amsterdam-based Checkpoint rapid testing service, two thirds of clients (around half were men who have sex with men and half heterosexual people) said they had chosen the service because of the speed with which they could get their results (Koevoets & van Loon, 2004).

In the evaluation of the New Zealand AIDS Foundation's trial of community-based rapid HIV testing, the most common reasons given for choosing the service were speed and anonymity (Smythe, 2007). 85% of the 144 people who completed the evaluation said the availability of a rapid test had influenced their decision to have a HIV test, providing comments such as 'bloody good, quick, easy, painless and saved the agony over waiting for a result' (p. 19). The vast majority said that in the future they would prefer to use RHT again rather than standard testing.

The Toronto-based Hassle Free Clinic found high levels of satisfaction with its trial of rapid HIV testing among 1261 people who participated in an evaluation study (Guenter et al, 2008). 97% of 1182 rapid testers who tested negative said they would choose the rapid test again. The four HIV-positive patients who took part in a follow-up interview said they were happy with the rapid test process, but had found the waiting period for confirmatory results stressful.

## 8 Outcomes of rapid HIV testing

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Studies reporting on the outcomes of rapid HIV testing programs overwhelmingly describe beneficial outcomes. These include:

- successful engagement of different populations (include hard-to-reach, itinerant and at-risk groups) in HIV testing
- increases in the number of people presenting for HIV testing
- reduction in the time taken to deliver results
- increases in the proportion of people receiving their test results
- identification of previously undiagnosed cases of HIV infection
- increases in the proportion of newly diagnosed HIV-positive people referred into HIV treatment and care

As has been described above in *Consumer views* section, clients of rapid testing services are also generally very supportive of RHT and prefer it to standard testing. Details of studies describing outcomes are given below. It should be noted that the majority of studies described here are from the US, which has traditionally experienced low rates of return for HIV test results. As has been noted in a review of RHT in Canada, in contexts where there is a different history and pattern of HIV testing some of the identified benefits of rapid testing may not be straightforwardly replicated (see Elliott & Jürgens, 2000).

The Dallas trial of rapid HIV testing (Kassler et al, 1997) reported a 7% increase in the overall number of people tested for HIV at the anonymous testing clinic and a 29% increase at the STD clinic (compared with baseline). The trial found increases in the numbers of HIV-negative and HIV-positive clients who received their test results at both clinics. In particular, there was a 210% increase in the number of HIV-negative clients and a 23% increase in the number of HIV-positive clients receiving their test results at the STD clinic. Previously, the return

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rate at the STD clinic had been particularly poor, with only 30% of HIV-negative and 79% of HIV-positive clients returning for results. The trial also found that RHT cost less than standard testing and that clients who received the rapid test were no more likely than those who had received a standard test to be diagnosed with a sexually transmitted infection in the year following testing.

The large scale evaluation of rapid HIV testing in 61 testing sites across New York State found that 37% more HIV tests were performed in the 6 months after rapid tests were made available compared with the same period in the previous year (San Antonio-Gaddy et al, 2006). Of 6187 HIV tests in 2003, 5771 (93%) were rapid tests. The numbers of HIV-negative and HIV-positive clients receiving their results increased after the introduction of RHT. Of those found to be HIV-positive, 81% of those who underwent rapid testing returned for their confirmation test results.

A recent review of the rapid HIV testing program in 10 STD clinics in New York City found a dramatic increase in the number of HIV tests performed since RHT was introduced (Cummiskey et al, 2008). In 2003, before RHT was introduced, 33,375 standard HIV tests were performed by these clinics. By 2007, the same clinics performed 60,281 tests of which 607 (1.0%) were confirmed positive.

In a study comparing rapid HIV testing acceptability and uptake at a STD clinic, emergency department and correctional facility (Kendrick et al, 2004), 98% of those who consented to have a rapid test in all three settings received their results within two hours. HIV infection rates varied, from 0.9% in the jail to 2.7% in the STD clinic and 2.8% in the emergency department. 82% of those diagnosed with HIV infection during the study were referred into clinical care.

A study of rapid HIV testing among homeless people attending shelters, hostels and free meal programs in San Francisco approached 1614 individuals of whom 1213 (75%) consented to be tested (Buchér et al, 2007). Participants reported high lifetime rates of injecting drug use (46%), sex work (33%) and, among male participants, homosexual sex (38%). All participants who consented for testing received same-day results. The HIV prevalence among previously negative or untested participants was 3.5%. 81% of those who had a reactive rapid test returned for confirmatory results. 87% of those who returned for confirmatory testing reported at least one follow-up visit with a health care provider in the 6 months following diagnosis.

An evaluation of the Terrence Higgins Trust's fasTest service in the UK found that it was feasible to offer rapid HIV testing outside traditional sexual health clinics (GUM clinics) and to successfully attract 'high-risk' groups such as gay and bisexual men and migrants from African countries (Weatherburn et al, 2006). 937 people underwent rapid testing in four clinics and participated in the evaluation study. All received their HIV test results. 30 new diagnoses (a prevalence of 2.9%) were identified and confirmed with full serology. Gay and bisexual men had a higher HIV prevalence (3.8%) than heterosexual participants (2.3%). All of those diagnosed with HIV who could be followed up engaged with HIV care. It had been hypothesised that RHT might help identify people earlier after HIV infection, but comparisons with GUM clinical data suggested there was no difference in the proportion of late presentations. Across the four clinics, on average one rapid test was conducted every 41 minutes of clinical staff time. No fasTest clinic ran at full capacity during the evaluation period, although the authors suggested that the cost of conducting rapid tests dropped during the study period as staff became more experienced with the RHT process.

The Amsterdam-based Checkpoint rapid testing service, operated by the HIV Association Netherlands for one night a week, tested 1455 people in an 18 month period (Koevoets & van Loon, 2004). There were roughly equal numbers of men who have sex with men and heterosexual people who were tested. No false positive tests were found (using the Abbott Determine rapid test, confirmed by ELISA and Western blot). The prevalence of those had rapid testing (2.8%) was higher than the prevalence found among those who had standard testing in Amsterdam (1.1%).

The New Zealand AIDS Foundation's rapid testing service in Auckland found an increase in the number of people presenting for HIV testing, from 64 standard tests in the previous year to 155 rapid tests during the trial period (Smythe, 2007). 90% of those presenting for RHT were male. 50% of male participants identified as gay, 21% as bisexual and 27% as heterosexual. 64% of participants identified as Pakeha (white New Zealanders) and 13% as Asian. 16% of those presenting for testing were in serodiscordant relationships, 7% as commercial

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sex workers and 8% as injecting drug users. The majority of participants heard about the service through the NZAF website or the local gay newspaper. The majority of participant said they got their test results within 40 minutes. Details of test outcomes are not given in the evaluation report. The evaluation concludes that community-based RHT is feasible and attractive to clients, but notes that the success of the trial had diverted NZAF staff time and resources, creating waiting lists for counselling.

A mobile van testing service in Baltimore found that of 439 clients who consented to HIV testing, nearly two thirds opted for a rapid HIV test (OraQuick) over a traditional test (Liang et al, 2005). African American clients were significantly more likely to opt for RHT, while those with a recent experience of drug treatment were less likely to do so. Around 90% of those who undertook rapid testing received their test results. This was a considerably higher proportion compared with those who had a standard test, where only 11% of those who tested HIV-positive and 40% who tested HIV-negative returned for their results. The authors concluded that RHT may be particularly useful in increasing HIV testing among itinerant populations who may have difficulty in returning to collect standard test results, although it is unclear from the study how many clients who tested positive using RHT received confirmatory test results or were referred into treatment or care.

Rapid testing was offered as an alternative to standard testing at Toronto's Hassle Free Clinic, an anonymous testing centre (Guenter et al, 2008). The vast majority (91%) of 1610 clients tested between 2001 and 2002 opted for a rapid test. Clients were predominantly male with a mean age of 32 years. 61% of male participants were exclusively homosexual and 30% exclusively heterosexual. Standard testers were significantly more likely to be women, to be a repeat tester at the clinic or to not have been aware of the choice of tests before arriving at the clinic. Among 1610 tests the overall HIV prevalence was 1.4%. All rapid testers received their initial test results and 82% of those testing positive (18 of 22) returned for their confirmatory results.

The US Centers for Disease Control funded a demonstration project of rapid testing by eight community organisations across the USA (Aguirre et al, 2007). 23,900 people were tested and provided data for analysis during 2004-2006. 39% of participants were non-Hispanic blacks, 31% were Hispanic, and 21% non-Hispanic whites. 63% were male, 50% had no health insurance and 9% were homeless. 17% of participants reported male-male sex and 6% reported injecting drug use in the previous year. 30% of participants had never been tested for HIV. 331 people (1% of the total) had reactive rapid test results and 286 (86% of the subtotal) returned for confirmatory results. 17 (6%) of the 286 were shown to be false positives. The rapid tests therefore had a positive predictive value of 94%. 86% of those newly diagnosed with HIV were referred into HIV care. An editorial commentary on the study suggests that those with preliminary positive results should be referred straight to specialist HIV care to improve the proportion of new diagnoses who access treatment and support.

Rapid HIV testing was made available in addition to standard testing in two of Seattle's gay sex venues (a sauna and a sex club) and a participant study was conducted (Spielberg et al, 2003b). The majority of the 437 men tested (and who filled in a survey) were white, aged over 30 and university educated. A third reported illicit drug use in the previous 12 months, a third reported some unprotected anal intercourse (UAI) since their last HIV test, and a third said they had had unsafe sex (undefined) while intoxicated in the previous two months. The rapid test used (Single Use Diagnostic System for HIV-1) performed in line with the manufacturer's product information (100% sensitivity and 99.6% specificity). 5 men who had a rapid test tested positive during the study and all returned to collect confirmatory results. The authors suggested that the interval between a preliminary positive rapid test and confirmatory results gave participants time to consider and accept the likelihood of being HIV positive. In contrast, only 9 of the 17 people who opted for standard testing and tested positive returned for their results during the study.

The authors of the Seattle bathhouse study reported that venue owners who participated in the rapid testing trial became advocates for the roll-out of RHT in other venues and that they considered RHT the best form of HIV testing for sex venues (Spielberg et al, 2003b). The authors also thought that despite the costs of staff training and support, and the need for a laboratory to undertake regular quality assurance procedures, RHT was more cost effective than standard HIV testing.

A US evaluation compared standard and rapid HIV testing in a San Francisco gay bathhouse (Huebner et al, in press). 492 men had standard tests and 528 had rapid tests during the study period. The HIV prevalence was similar for both standard (3.7%) and rapid testing (2.5%) in the bathhouse. Significantly more men received their

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results from rapid testing compared with standard testing e.g. of those testing positive, 85% of those who had rapid tests received their confirmatory results compared with 50% of those having a standard test. 108 of the standard testers and 161 of the rapid testers were interviewed 3 months after testing. The two groups were demographically similar and reported similar sexual practices and risk behaviours. The study found that both standard and rapid testers reported increased communication about HIV status with sexual partners, more discussion of condoms and fewer incidents of unprotected anal intercourse 3 months after testing. The only difference between standard and rapid testers was that rapid testers reported an increase in the frequency of sex acts while intoxicated, compared with a reduction among standard testers. Reasons for this difference were unclear. The authors conclude that offering rapid testing within a gay sex venue attracts similar clients to those who would undertake standard testing, that more clients receive their results, and that some positive behavioural effects of testing can be seen. However, the authors comment that the shorter period of counselling associated with RHT may not be as effective in prompting behaviour change as in standard testing (although we should note that the assumption that voluntary counselling and testing has straightforward effects on behaviour is perhaps simplistic).

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