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# Exploring pharmacy and home-based sexually transmissible infection testing

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**Abstract.** ***Background*:** This study assessed the feasibility and acceptability of pharmacy and home-based sexually transmissible infection (STI) screening as alternate testing venues among emergency contraception (EC) users. ***Methods*:** The study included two phases in February 2011–July 2012. In Phase I, customers purchasing EC from eight pharmacies in Manhattan received vouchers for free STI testing at onsite medical clinics. In Phase II, three Facebook ads targeted EC users to connect them with free home-based STI test kits ordered online. Participants completed a self-administered survey. ***Results*:** Only 38 participants enrolled in Phase I: 90% female, ≤29 years (74%), 45% White non-Hispanic and 75% college graduates; 71% were not tested for STIs in the past year and 68% reported a new partner in the past 3 months. None tested positive for STIs. In Phase II, ads led to >45 000 click-throughs, 382 completed the survey and 290 requested kits; 28% were returned. Phase II participants were younger and less educated than Phase I participants; six tested positive for STIs. Challenges included recruitment, pharmacy staff participation, advertising with discretion and cost. ***Conclusions*:** This study found low uptake of pharmacy and home-based testing among EC users; however, STI testing in these settings is feasible and the acceptability findings indicate an appeal among younger women for testing in non-traditional settings. Collaborating with and training pharmacy and medical staff are key elements of service provision. Future research should explore how different permutations of expanding screening in non-traditional settings could improve testing uptake and detect additional STI cases.

**Additional keywords:** emergency contraception, Internet, point-of-care testing, social media, United States.

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## Introduction

There are ~20 million new cases of sexually transmissible infections (STIs) in the US each year, half occurring among 15- to 24-year-olds, with females bearing a disproportionate burden of disease.[1,2] Many infections go undiagnosed.[3] Barriers such as stigma, privacy and confidentiality, as well as cost, transportation and inconvenient clinic hours, have been linked to delays in seeking care and treatment, thus perpetuating the 'hidden epidemic' of STIs.[4,5] Non-traditional STI testing settings, such as pharmacy retail clinics and home-based testing, may serve as a safety net for individuals struggling with these challenges and barriers.

STI clinic client satisfaction has been mixed, with some finding them convenient, efficient and affordable,[6–8] and others feeling embarrassed and stigmatised by having to seek care in a clinic specifically dedicated to diagnosis and treatment of STIs (with minimal privacy).[9,10] Previous research suggests that STI clientele perceive clinics to be in inconvenient, low-income neighbourhoods, serving 'lower class people'.[9,11] Clients have reported concerns about confidential billing and complained of long wait times, inconvenient hours and judgmental staff.[8,9,12–13]

Retail pharmacies are becoming omnipresent; ~90% of urban and suburban consumers live 2–5 miles from their local pharmacy and 70% of rural consumers live within 15 min of one.[14] As of 2009, it was estimated that a third of the US population lived within a 10-min driving distance of a retail clinic (a walk-in medical clinic located inside a retail store (e.g. a pharmacy) that can treat minor illnesses and provide preventative health care services) and, on average, has access to 21 competing pharmacies in close proximity to their current pharmacy.[14,15] Many are open 24 h a day, 7 days a week to allow convenient access to services. As more pharmacies have expanded their business models to include public health services, there has been a call to 'embrace

 

the intersectoral nature of public health and work to achieve our public health mission through the dynamic arena of pharmacy practice (p. 142).'[16] Retail clinics have the potential to offer greater access and anonymity in a much less stigmatised setting to those seeking STI testing. Some demonstration work has already been performed exploring the feasibility and acceptability of HIV testing in pharmacies,[17–21] but published literature exploring US-based introduction of STI testing into the pharmacy-setting is nearly non-existent.

Similarly, home-based self-administered vaginal swabs offer users the ability to administer a STI test in the privacy of their own home. The ability to order a self-collection kit through the Internet adds an additional layer of privacy in which individuals have a confidential space for STI information-seeking and test kit ordering. Self-administered vaginal swabs have demonstrated success in some parts of the country, and have exhibited high usage and acceptability among the women using them for home collection with a mail service directly to a laboratory.[22,23] Home self-collection can also be cost effective, since a clinic visit is eliminated. Presumably, even self-collection in a pharmacy may also be cost-saving.[24] Additional research exploring the normalisation of chlamydia (*Chlamydia trachomatis*) testing has indicated that home testing is generally favoured by women.[25,26] Other developed countries have afforded individuals the option of pharmacy and home-based chlamydia testing for some time.[27,28]

## Objectives

Given the lack of demonstration studies in the US exploring pharmacy-based STI testing and the need to consider alternate settings and methods to facilitate STI testing,[4,29] this pilot study sought to assess: (1) the acceptability of retail clinic testing and purchasing home-based STI kits in pharmacies among emergency contraception (EC) users, (2) the feasibility of targeting EC users online for home-based STI testing and (3) whether EC users represented a missed opportunity for STI screening.

EC users were targeted for STI testing in these alternate settings because they are considered to be at risk for STI transmission. Most EC users report not having used a birth control method at last sex or worry that their birth control method had not worked, potentially putting them at risk for STIs.[30] Various studies have found EC users to be younger and inconsistent condom users, and to report higher numbers of sex partners.[31–35] Previous research indicates that EC users are less likely to have visited a gynaecologist in the past year and are more likely to report ever having an STI compared with non-users.[31,33–37] Since the introduction of EC dispensing in the pharmacy setting, many women bypass the former required interaction with a health care provider. In studies outside the US, chlamydia prevalence has been as high as 14% for individuals accepting screening in the pharmacy setting.[38,39] Heightened feelings of shame around EC use may cause users to avoid seeking STI testing.[40] The pilot took part in two phases. Phase I explored the feasibility and acceptability of testing in a pharmacy-based setting, and Phase II expanded the study into a partnership with 'I Want the Kit' (IWTK) (www.iwantthekit.org, accessed 7 August 2015), where recent EC users were targeted online through Facebook ads and STI testing was offered for free through a mail-order kit so that testing could be done in the privacy of one's home.

## Methods

### *Phase I: pharmacy retail clinic-based testing*

From February 2011 to June 2012, researchers partnered with retail clinics co-located within eight retail pharmacies in Manhattan to pilot a program providing free chlamydia and gonorrhoea (*Neisseria gonorrhoeae*) testing. Clinics were typically located by the pharmacy check-out and run by licenced doctors and nurse practitioners. Pharmacy and clinic personnel were trained by the project coordinator and research assistant in study protocols. Eligibility criteria included purchasing EC in the pharmacy where the retail clinic was located and being at least 18 years old. Vouchers advertising free STI testing were provided directly to the retail pharmacists to be attached to the boxes of EC. Pharmacists and pharmacy staff were responsible for promoting the STI testing to the consumer. After purchasing EC, anyone (male or female), could go to the clinic within the store, either at that time or at a later time, to request STI testing. Express testing was implemented, meaning participants did not have to wait to be tested.

Prior to testing, the participant provided informed consent and took a brief, confidential survey about their sexual and reproductive health (questions about recent use of contraceptives, EC, and previous STI testing), including demographics, before providing a urine sample to be tested for chlamydia and gonorrhoea. Participants were given a $20 USD Amazon gift card for their participation before providing the specimen. Urine specimens for testing were collected by participants in the clinic bathroom. At the beginning of the study, an attempt was made to survey participants opting out but, ultimately, this was discontinued due to lack of participation. During the course of the study, 38 participants were tested, and the clinic and the medical director reported all results to researchers at Public Health Solutions (PHS). Participants were notified of their results within 3–5 days.

### *Phase II: home-based testing*

In order to provide chlamydia and gonorrhoea sample collection kits through the mail, we partnered with IWTK, an online website which, since 2004, has offered collection kits for self-collected samples (vaginal and rectal) with mailing to a laboratory at Johns Hopkins University for chlamydia, gonorrhoea and trichomonas testing. Over 6000 women have used the IWTK program in Maryland, Washington DC and Alaska.

The home collection kits were advertised on Facebook from September 2011 until August 2012 by creating banner advertisements that appeared on the pages of our target audience; over the course of the study, we created 12 separate ads. The ad targeting criteria were: women aged 18–35 years in New York City (expanded to New York State in December 2011); eligibility criteria included EC use in the past 30 days. Facebook approved all ads according to its guidelines. Each ad included a headline and a link to the study survey's website (e.g. 'Used Emergency Contraception? You may have avoided pregnancy but

might still be at risk for STDs. Click here for free STD testing.'). Facebook charged, on average, a fee of $1.10 USD for each click a user made on one of our advertisements.

### *Study procedures*

When a prospective participant clicked on the banner ad, they were directed to the study site. At the site, they took an eligibility screener to verify that they were women between 18 and 35 years of age, in New York City (subsequently New York State) who had taken EC in the past 30 days. If they were eligible, they saw an online consent form, clicked to indicate consent and proceeded to the survey. The survey included almost identical questions to those in the Phase I survey. After finishing the survey, the participant completed a form requesting a kit. The online form with the participant's name and address went directly to project partners at IWTK; researchers at PHS did not have access to any personally identifying information.

Kits were sent out the same day or 2 days later, depending on when the request came in (e.g. on the weekend). On average, kits were returned by participants within 1–5 days of receipt, with an additional 1–5 days added on for laboratory processing (result time: median, 14 days; average, 22 days, including mailing times). All results were reported anonymously to PHS researchers. IWTK was responsible for notifying individuals of negative results. Positive results were reported to the medical director at PHS, who then notified the local health department of positive cases. Contacting and treatment were the responsibility of the local health department. The total cost for a kit, which included testing for chlamydia, gonorrhoea, trichomonas, and the cost of shipping kits out and back, was $55 but was free to participants.

This project underwent ethical review by the Centers For Disease Control and Prevention (CDC), as required by the CDC's institutional review board and PHS' institutional review board approved study procedures for both arms of this study. Informed consent was obtained online before the IWTK survey and at the clinic for those in the pharmacy study.

## Results

### *Sample and demographics*

Between February 2011 and July 2012, 38 participants enrolled in the Phase I of the study. Pharmacy participants were mostly female (90%), in their mid- to late 20s (45%), White non-Hispanic (45%) and college graduates (75%). Overall, 73% had purchased EC before; 61% purchased EC because they did not use birth control at their last encounter and 29% were

**Table 1. Demographics of the study participants**
IWTK, I Want The Kit

| *n* (%) | Pharmacy participants *n* = 38 | IWTK participants *n* = 81 | IWTK (no kit return) *n* = 209 |
|---|---|---|---|
| Pharmacy site | | | |
| 1 | 3 (7.9) | – | – |
| 2 | 4 (10.5) | – | – |
| 3 | 3 (7.9) | – | – |
| 4 | 17 (44.7) | – | – |
| 6 | 3 (7.9) | – | – |
| 7 | 4 (10.5) | – | – |
| 8 | 4 (10.5) | – | – |
| Age (years) | | | |
| 17–19[A] | 2 (5.3) | 32 (39.5) | 72 (34.4) |
| 20–24 | 9 (23.7) | 24 (29.6) | 82 (39.2) |
| 25–29 | 17 (44.7) | 17 (21.0) | 39 (18.7) |
| 30–34 | 7 (18.4) | 8 (9.9) | 16 (7.7) |
| 35+ | 3 (7.9) | – | – |
| Gender | | | |
| Male[B] | 4 (10.5) | – | – |
| Female | 34 (89.5) | 81 (100.00) | 209 (100.00) |
| Ethnicity[C] | | | |
| White non-Hispanic | 17 (44.7) | 41 (50.6) | 100 (47.8) |
| African-American or Black | 7 (18.4) | 18 (22.2) | 50 (23.9) |
| Hispanic or Latino(a) | 8 (21.1) | 13 (16.0) | 45 (21.5) |
| Asian or Pacific Islander | 4 (10.5) | 6 (7.4) | 16 (7.7) |
| Other | 1 (2.6) | 6 (7.4) | 6 (2.9) |
| Prefer not to answer | 1 (2.6) | 3 (3.7) | 7 (3.3) |
| Education | | | |
| High school or less | 0 | 12 (14.8) | 39 (18.7) |
| Some college | 9 (25.0) | 45 (55.6) | 125 (59.8) |
| College grad | 27 (75.0) | 22 (27.2) | 40 (19.1) |
| Prefer not to answer | 0 | 2 (2.5) | 5 (2.4) |

[A]IWTK was restricted to women aged ≥18+ years.
[B]Only women were eligible for the IWTK portion of the study.
[C]Participants were able to select multiple responses for IWTK.

worried that their birth control method did not work (see Table 1).

### *I Want The Kit*

Approximately $50 000 USD was spent on Facebook advertising, which resulted in 45 766 clicks to our ads; 6% (2738) of those took the eligibility screener. Of those, 804 (29%) were eligible to participate in Phase II of the study; 382 (48%) completed the entire survey of which 290 (76%) requested a kit and 81 kits were returned (28%) (see Fig. 1). Most participants were in their late teens (18–19 years, 40%) or early 20s (30%), white non-Hispanic (51%) and had some college education (56%). Overall, 62% had purchased EC before and over half (57%) had used EC because they did not use birth control at their last encounter; 31% were worried that their birth control method had not worked at last sex.

### *Recent sexual behaviour and STI testing results*

Phase I. Sixty-eight percent of pharmacy retail clinic participants reported a new partner in the past 3 months. Over three-quarters used condoms as their primary birth control method (76%); however, almost half (49%) had not used a condom at last sex. Only 11% had been tested for STIs in the past year. None tested positive for chlamydia or gonorrhoea (see Table 2).

Phase II. Similarly, 63% of participants who participated in the IWTK screening reported a new partner in the past 3 months; 80% had had two or more partners the last 12 months. Most used condoms as their primary birth control method (64%); however, over half (59%) had not used a condom at last sex. Very few IWTK participants (15%) reported being tested for STIs in the past year. Positive cases were detected among the IWTK cohort: four were positive for chlamydia; two were positive for trichomonas.

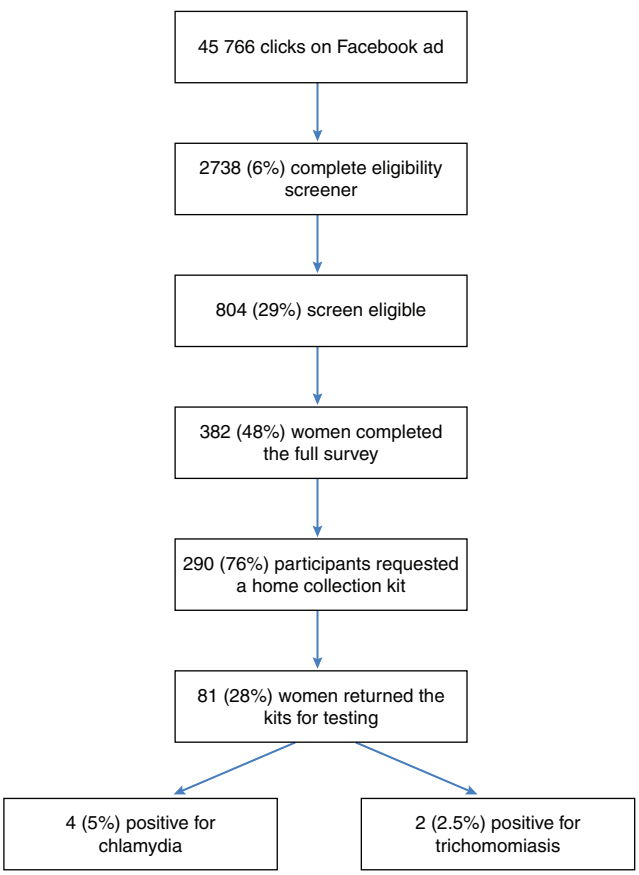


**Fig. 1.** I Want The Kit (IWTK) recruitment and participation flow chart.

In Phase II, few differences existed between those who returned kits and those who did not. Participants returning kits more frequently reported a recent sex partner in the past 3 months (63% *vs.* 55%) and two or more sex partners in the past 12 months (80% *vs.* 66%), but these differences were not statistically significant. Non-returners, however, were no more likely than returners to have been tested for STIs in the past 12 months. Overall, home-based participants were younger than pharmacy retail clinic participants (40% *vs.* 5%, under the age of 20) and less likely to have finished college. Pharmacy retail clinic participants were more likely to report only having one sex partner in the past year (35% *vs.* 15%), and none tested positive for STIs.

### *Acceptability of pharmacy-based testing and home kits*

Almost all pharmacy clinic participants ($n = 37$) agreed that pharmacies should offer STI testing. Most pharmacy participants (60%) were happy with testing they received at the clinics located within the retail pharmacies. Only one participant was not happy; 13 were unsure. Most pharmacy clinic participants reported that they would be willing to purchase a take-home STI testing kit ($25 USD) at the pharmacy clinic (83%) or online (70%); 92% were willing if it was free. Among IWTK participants, 93% thought that pharmacies should offer STI testing, 74% reported that they would be willing to purchase ($25 USD) a take-home STI kit at the pharmacy and 99% were willing if it was free (see Table 3).

## Discussion

This study found that STI testing at pharmacy retail clinics was logistically feasible, but low uptake suggests that it may not be well accepted among EC users; 38 participants represent a small fraction of the thousands of EC prescriptions that were dispensed during the study period. Similarly, offering home-based STI testing through an online order system was feasible, but advertising comes at a high price tag, with small participatory numbers and low numbers of kit returns. Inconsistent with the testing behaviours we observed, our survey data revealed high acceptability among participants for pharmacy-based testing and home kit offering. Overall, we spent almost $10 000 USD to detect each new case, which would not be sustainable in a programmatic setting. As we anticipate and prepare for the introduction of point-of-care testing for HIV and for STIs in the pharmacy setting, many lessons can be learned from this pilot study.

Challenges for Phase I of the study involved recruitment, advertising with discretion, location and pharmacy staff participation. Despite a $20 USD incentive and a voucher to return at a more convenient time, few participants enrolled. Clients unwilling to participate would not share why as we attempted to survey those opting out (ultimately, discontinued).

**Table 2. Characteristics, sexual and testing behaviours of emergency contraceptive (EC) users**
IWTK, I Want The Kit; STI, sexually transmissible infection

| *n* (%) | Pharmacy participants *n* = 38 | IWTK participants *n* = 81 | IWTK (no kit return) *n* = 209 |
|---|---|---|---|
| Purchased EC today | | | |
| Yes | 17 (45.9) | – | – |
| No | 20 (54.1) | – | – |
| Reasons for EC purchase[A] | | | |
| Birth control method failed | 11 (28.9) | 25 (30.9) | 64 (30.6) |
| Did not use birth control | 23 (60.5) | 46 (56.8) | 131 (62.7) |
| Some other reason | 4 (10.5) | 12 (14.8) | 18 (8.6) |
| Ever purchased EC before | | | |
| Yes | 27 (73.0) | 50 (61.7) | 140 (67.0) |
| No | 10 (27.0) | 31 (38.3) | 69 (33.0) |
| New sex partner in last 3 months | | | |
| Yes | 25 (67.6) | 51 (63.0) | 114 (54.5) |
| No | 9 (24.3) | 27 (33.3) | 83 (39.7) |
| Not sure | 0 (0) | 1 (1.2) | 2 (1.0) |
| Prefer not to answer | 3 (8.1) | 2 (2.5) | 10 (4.8) |
| ≥2 sex partners in the last 12 months | | | |
| Yes | 21 (56.8) | 65 (80.2) | 137 (65.6) |
| No | 13 (35.1) | 13 (16.0) | 58 (27.8) |
| Not sure | 0 (0) | 1 (1.2) | 1 (0.5) |
| Prefer not to answer | 3 (8.1) | 2 (2.5) | 13 (6.2) |
| Condom use at last sex | | | |
| Yes | 15 (40.5) | 29 (35.8) | 63 (30.1) |
| No | 18 (48.6) | 48 (59.3) | 135 (64.6) |
| Not sure | 1 (2.7) | 0 (0) | 6 (2.9) |
| Prefer not to answer | 3 (8.1) | 4 (4.9) | 5 (2.4) |
| Type of birth control[B] | | | |
| None | 4 (10.5) | 16 (19.8) | 34 (16.3) |
| Condoms | 29 (76.3) | 52 (64.2) | 143 (68.4) |
| Birth control pills | 10 (26.3) | 12 (14.8) | 52 (24.9) |
| Other hormonal methods | 1 (2.6) | 5 (6.2) | 10 (4.8) |
| Don't know | 0 (0) | 1 (1.2) | 1 (0.5) |
| Other | 2 (5.3) | 7 (8.6) | 6 (2.9) |
| STI test in past 12 months | | | |
| Yes | 4 (10.8) | 12 (14.8) | 26 (12.4) |
| No | 25 (67.6) | 49 (60.5) | 146 (69.9) |
| Not sure | 8 (21.6) | 18 (22.2) | 31 (14.8) |
| Prefer not to answer | 0 (0) | 2 (2.5) | 6 (2.9) |
| STI positivity | | | |
| Positive for gonorrhoea | 0 (0) | 0 (0) | – |
| Positive for chlamydia | 0 (0) | 4 (4.9) | – |
| Positive for trichomoniasis | 0 (0) | 2 (2.5) | – |

[A]Multiple response options were allowed for IWTK.
[B]Multiple response options were allowed.

Moreover, it was difficult to promote the study without stigmatising EC users. Unable to display posters in the pharmacy, we had to rely on attaching the flyer to the EC box itself. Participants may not have seen or read the voucher until after they left the premises if they were not told about the study by the pharmacist or a member of the pharmacy staff. Brabin *et al*. faced similar challenges and speculated that uptake in the pharmacy setting would have been more successful had more been done to raise awareness of screening and its availability.[41] Certain pharmacies were more enthusiastic about helping to promote our study; 45% of the participants came from one pharmacy where the pharmacists were very proactive. Early on, we sent a secret shopper to each participating pharmacy, but the shopper was only told about the study at three of the eight pharmacies, suggesting that recruitment for a research study was a low priority in some high-volume pharmacies. Brabin *et al*. and Emmerton *et al*.[41,42] experienced similar challenges, reporting that pharmacy staff were not proactive in offering screening, did not consistently offer chlamydia screening (i.e. selection bias) and did not accurately record uptake rates. An Australian-based study tried incentivising pharmacies rather than participants. Gudka *et al*. gave each participating pharmacy $A1000, along with $A15 for every chlamydia test issued that was returned for testing. In return, their pharmacists played a more active role in counselling EC users and getting participant consent.[43] Given our low uptake and challenges with pharmacy staff, we should have considered incentivising pharmacists instead of participants[29,41] and focussed on initial partnerships only with

**Table 3. Acceptability of pharmacy and home-based testing**
IWTK, I Want The Kit; STI, sexually transmissible infection

| *n* (%) | Pharmacy participants *n* = 38 | IWTK participants *n* = 81 | IWTK (no kit return) *n* = 209 |
|---|---|---|---|
| Happy with STI testing experience received in the pharmacy | | | |
| Yes | 22 (59.5) | – | – |
| No | 1 (2.7) | – | – |
| Not sure | 13 (35.1) | – | – |
| Prefer not to answer | 1 (2.7) | – | – |
| Pharmacies should offer STI testing | | | |
| Yes | 37 (97.3) | 75 (92.6) | 190 (90.9) |
| No | 0 (0) | 2 (2.5) | 5 (2.4) |
| Not sure | 0 (0) | 4 (4.9) | 13 (6.2) |
| Prefer not to answer | 1 (2.7) | 0 (0) | 1 (0.5) |
| Likelihood of using a STI home testing kit from pharmacy (if free or covered by insurance)? | | | |
| Very likely | 31 (81.6) | 65 (80.2) | 161 (77.0) |
| Likely | 4 (10.5) | 15 (18.5) | 40 (19.1) |
| Unlikely | 2 (5.3) | 0 (0) | 5 (2.4) |
| Very unlikely | 1 (2.6) | 1 (1.2) | 3 (1.4) |
| If it cost $25 USD | | | |
| Very likely | 13 (37.1) | 29 (35.8) | 64 (30.6) |
| Likely | 16 (45.7) | 31 (38.3) | 77 (36.8) |
| Unlikely | 5 (14.3) | 15 (18.5) | 43 (20.6) |
| Very unlikely | 1 (2.9) | 6 (7.4) | 25 (12.0) |
| Likelihood of ordering an STI home testing kit online (if free or covered by insurance)? | | | |
| Very likely | 24 (63.2) | – | – |
| Likely | 8 (21.1) | – | – |
| Unlikely | 5 (13.2) | – | – |
| Very unlikely | 1 (2.6) | – | – |
| If it cost $25 USD | | | |
| Very likely | 10 (27.8) | – | – |
| Likely | 15 (41.7) | – | – |
| Unlikely | 6 (16.7) | – | – |
| Very unlikely | 5 (13.9) | – | – |

enthusiastic pharmacies. Pharmacies interested in offering STI testing without a built-in medical clinic (or a public restroom or private space) may face greater logistical challenges than those discussed here.

In Phase II of the study, we learned that detecting infections came with a high price tag. The hefty Facebook advertising budget used to recruit the sample could potentially have been more impactful as part of a larger regional or national STI testing campaign.[44] Similar to other studies exploring STI testing in non-traditional settings, effective marketing and outreach is critical to getting people to use services.[22,41,44–46] However, the number of click-through rates for the online survey indicates some level of interest or acceptability among participants and 382 survey responses were obtained with the money spent. Getting participants to return the kit was challenging, with only a 28% return rate; however, the return rate was similar to that of other comparable studies (12–28%).[27,41–43] Return rates can improve over time when more women become familiar with such programs. Recently, IWTK return rates have averaged 67% (C. Gaydos, pers. comm., 12 December, 2014). Again, we did not know why participants chose not to return kits. Previous research suggests it may have something to do with relationship status, perceived low risk or misunderstanding around the importance of testing.[41] Removal of the consent form could potentially improve the return rate, as has happened with IWTK. Another approach could be to include the kit with the EC packet[43] or make it available for a small price. A moderate fee for a kit may improve the return rate, as some participants in previous research were willing to pay,[43] as were participants from this study.

The participating pharmacy chain would not share the denominator of monthly EC purchases, making it difficult to calculate the actual study participation rate. We were also unable to determine if participants were truly at high risk for STIs or had a failure in birth control within their monogamous relationship. Given these issues, along with low uptake among EC users, we were unable to ascertain whether EC users represented a missed opportunity for STI screening. Future demonstration projects could target adolescents and young adults for general STI testing, since EC users represent a small subpopulation of those using pharmacy services and those at risk for STI. IWTK was more successful at reaching younger women, suggesting that home-based testing may be more appealing to a younger demographic; the ‘free’ price tag, ease and anonymity

may make online ordering of home collection kits especially attractive. A positive experience with home collection kits may empower young women to test more in the future. Likewise, treatment may have prevented infections in their future partners. However, we suspect that in the US, widespread pharmacy-based STI testing will come first and home collection will follow, given the challenges with laboratory waivers for home tests. Implementation of the study in high morbidity areas could potentially increase the number of cases detected and improve the outcome expenditure. Our IWTK survey results indicate support for pharmacy retail clinic-based STI testing; however, the low uptake of retail clinic pharmacy testing in Phase I indicates that more research is needed on how to market pharmacies as acceptable, reputable and confidential venues for testing.[4]

HIV home test kits are already on pharmacy shelves and HIV testing is being investigated in the pharmacy setting. Much can be learned from the HIV community's experience, as well as other experienced countries, on how to fund laboratory support, connect testers with their results and link those testing positive with treatment and care.[17] US programs that have been successful with the distribution of home collection kits, such as IWTK and California's 'I Know' campaign, should be considered as models for adaptation or expansion on a national level.[47] In the meantime, greater availability of rapid point-of-care tests, and collaborations such as practice agreements between physicians and pharmacists (as well as between local health departments, providers and pharmacies) could maximise connection to treatment.[16] Formative research is needed on how working with pharmacies to offer STI testing fits into pharmacies' overall business model, as the findings from this study may not apply to independent and community pharmacies, or any pharmacy without a built-in medical clinic.

## Conclusion

Our study found low uptake of pharmacy and home-based testing among EC users; however, STI testing in these settings is logistically feasible and the acceptability findings indicate that there is an appeal among younger women for testing in non-traditional settings. Collaborating with and training pharmacy and medical staff are key elements of service provision.[41] Future research should explore how different permutations of expanding screening in non-traditional settings like these could improve testing uptake and detect additional STI cases. The cost of detecting new infections was steep, but with the changes and improvements discussed above, it is possible for this type of prevention work to become more than just logistically feasible. It has the potential to become practice.

## Conflicts of interests

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The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.

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