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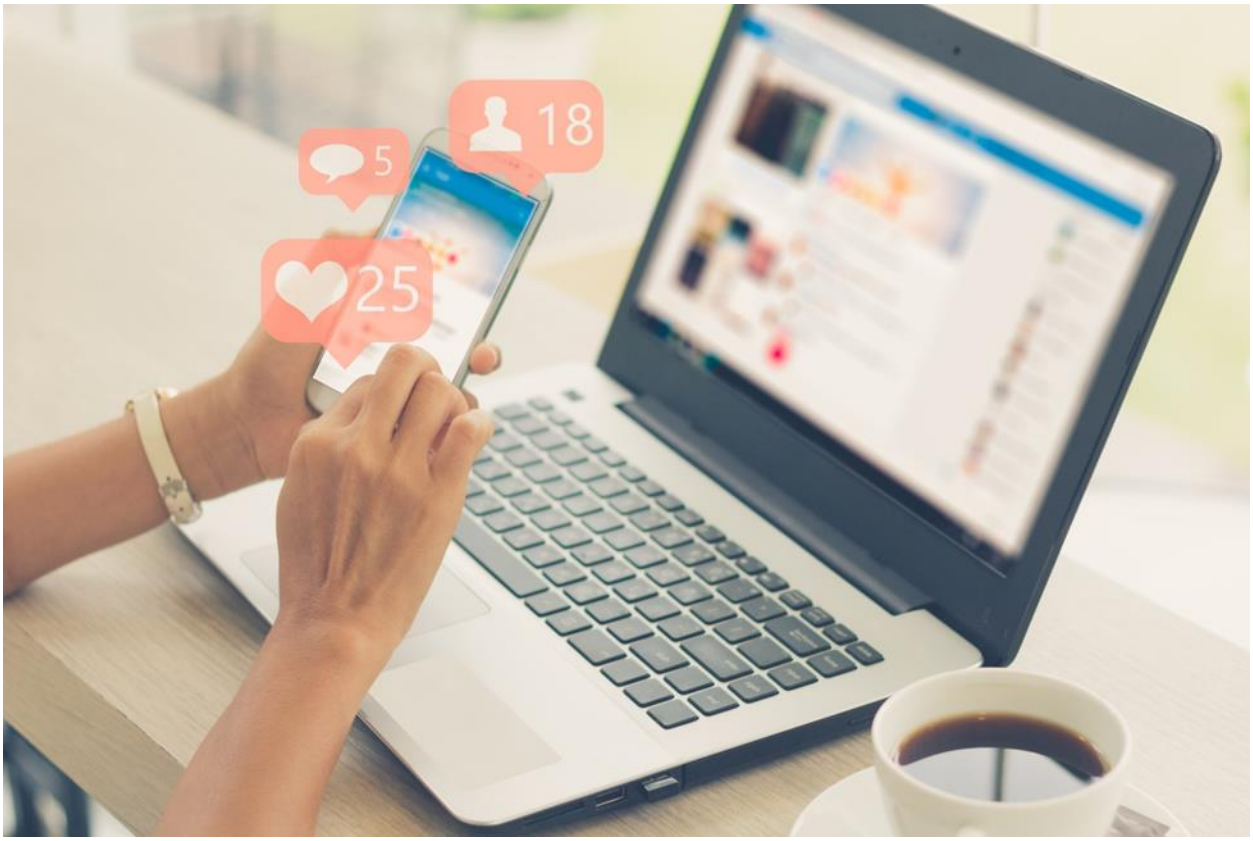
EVIDENCE BRIEF

Case and Contact Management for STIs: Internet-Based Contact Tracing



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Key Messages

- Internet-based contact tracing (ICT) for sexually transmitted infections (STIs) is being used successfully in several jurisdictions to notify sexual contacts and identify new cases, leading to increased screening and treatment for STIs.[1-17]
- ICT is valuable for both public health-led and client-led contact notification.
- Although there are risks and challenges to implementing ICT, there are clear benefits when there is no other way of notifying partners of a potential exposure and ICT could also complement standard notification methods, including in the event of an outbreak.

Issue and Research Question

Sexual contact tracing (also known as partner notification) refers to the practice of informing the sexual contacts of a case about their potential exposure and providing information about STI screening. The goals of contact tracing are to identify undiagnosed infections and reduce further transmission. When sexual contacts meet and communicate exclusively online, the information traditionally used to reach a contact of an STI, such as telephone number or address, is rarely known.[11,17-20] As a result, either the partner must be contacted through the internet using their online screen name or they will not be notified of the potential exposure at all. There is evidence to suggest that cases with online partners tend to have multiple partners.[21,22] Because those multiple partners are more likely to be casual, they may be more difficult to contact and the encounter may be higher risk for STI transmission;[21-29] however, there is some disagreement on the impact of higher risk behaviours on STI rates in people who use the internet for sexual partnerning.[21,23,25,27-32] The rise of digital technologies for sexual partnering presents a challenge for public health-led partner notification. Many public health practitioners want to be equipped to contact partners online while mitigating the risks and challenges of electronic communication (e.g., privacy concerns).

Our objective was to conduct a literature search in order to identify and summarize the evidence for use of social networking sites (SNS) and personal email for STI partner notification, as well as strategies to mitigate potential challenges. This document breaks down ICT into two categories: 1) the use of messaging on SNS and 2) the use of personal email. It provides a summary of the evidence on how these technologies have been used for contact tracing. Digital technologies will continue to evolve at a rapid rate and the platforms that are used will change. At the time of writing, examples of digital technology for sexual-partnering included various forms of SNS, such as internet chat rooms, dating and 'hook up' websites and mobile phone applications (apps), social media websites/apps and email systems. Mobile phone text messaging is another current digital technology, but given that it uses a traditional mode of contact tracing, i.e., phone number, it will not be addressed here.

Methods

On January 12, 2018 and December 19, 2018, Public Health Ontario (PHO) Library Services conducted a literature search in relevant databases (MEDLINE, Embase, PsychINFO, CINAHL, SocINDEX) using a combination of search terms related to STI contact tracing, the internet and social media. A total of 821 unique records were returned and titles and abstracts were screened for relevance. 159 full-text articles were reviewed and 25 were critically appraised using the Meta Quality Appraisal Tool (MetaQAT) and included in the final results.[33] The MetaQAT was used to help identify strengths and weaknesses in internal and external validity and whether the study should be included in our evidence summary. The detailed search strategy and complete results are available upon request.

Main Findings

Evidence for Use of Social Networking Sites (SNS)

SNS can be an effective tool for public health-led ICT and can potentially increase the number of sexual contacts notified. The first report of public health-led ICT was published in 2000 and describes the public health response to an outbreak of syphilis among men who have sex with men (MSM).[17] From seven cases, 97 sexual contacts were named and 42% of them were notified over the internet and tested for

syphilis.[17] Subsequent studies have also reported the successful contact of both confirmed cases and potential cases using SNS.[2-4,14-17] Two studies of MSM populations found that public health having a generic profile on SNS apps was acceptable to participants.[17,34] How SNS were used to notify contacts varied slightly. In most instances, public health created a generic profile on the SNS and then used the SNS messaging system to send messages directly to the individual profile names provided by the index case.

There are benefits to augmenting traditional contact tracing with ICT via SNS. These include being able to connect with sexual contacts faster than by phone, thereby reducing time to testing and treatment; being able to connect with contacts who might not have a stable address or phone number, but maintain their SNS profiles whenever they have internet access; and being able to visually identify the contacts if the online profile includes a clear headshot.[4,35] There is also evidence that supports using ICT in conjunction with a social network analysis approach to identify high risk sexual networks.[3,4] Documenting contacts' screen/profile names in the case file could provide useful information for this. Challenges to ICT are summarized in Table 1.

Evidence for Personal Email Notification

In addition to SNS, the internet has also been used to create websites that facilitate anonymous email contact notification (e.g., inSPOT, Let Them Know, CheckHimOut, WhyTest's Tell Them feature and Suggest A Test). InSPOT was a US-based website that cases could use to contact their partners anonymously via e-post cards sent using the recipient's email address. After its development in 2004, the tool was made available to public health in Canada and Romania and was translated into French and Spanish; however, at the time of publishing, this website is no longer available.[36,37] In 2008, Australia developed Let Them Know, which allows cases to anonymously notify their sexual contacts of potential STI exposure using a text message, email or a letter.[38,39] The Health Initiative for Men in British Columbia (BC) also has their own website called CheckHimOut, which allows for anonymous contact notification through email or text message and provides information about local sexual health clinics in BC for testing.[40] WhyTest, an Australian website, added a feature called Tell Them in 2006, which offered MSM the option to send anonymous e-post cards and text messages to exposed sexual contacts;[41] however, this platform was no longer active at the time this document was published. Suggest A Test is a Dutch online service developed in the Netherlands and piloted in 2012; it includes options to reach out to sexual partners anonymously through text message, personal message on a gay dating website, as well as sending an email or a letter.[42,43]

There is evidence that clients think sending and receiving email is an acceptable method of ICT; however, this is based on studies largely conducted before the widespread use of SNS. In one study, participants indicated that a service with the option to send anonymous emails would be useful and would facilitate communication with more contacts;[44] however, client-led email notification was seen as less personal and deemed most suitable when the relationship with the contact was brief and/or casual, if the relationship did not end on good terms or if the relationship involved violence.[44-46] Studies consistently revealed that given the option to send a text message or email, most cases preferred text messaging, likely due to convenience and perceived reliability.[35,38,42,47-50] In practice, actual usage of email for ICT was low in these studies. Multiple studies indicated low awareness of tools like InSPOT and Let Them Know, despite advertising campaigns to support their uptake in larger urban areas.[35,51] Though considered to be highly acceptable, the use of email for contact tracing is less preferred when other options, such as an in-person meeting or phone call, were available.[44,45,52] In one study, MSM participants, who have shown broad acceptance toward using email and e-cards as a form of ICT, demonstrated lower actual use of notification in comparison to heterosexual males.[44]

There are several examples in the literature of public health-led contact notification using email.[11,14,15,16] While few studies have examined the effectiveness of email ICT in getting contacts tested and treated for STIs, two studies have demonstrated that email ICT accounted for 21% and 40% of contacts being examined and, if necessary, treated.[2,5] The advantages to public health-led ICT using email include its passive nature compared to chat rooms, which require public health to be present at the same time as the contacts and existing familiarity with email technology;[14,15] however, email may not be as effective as SNS messaging and text messages.[14] Because of the increasing popularity of SNS to identify and communicate with sexual contacts, index cases may not even have an email address for their contacts.

Challenges may arise for public health professionals when implementing ICT. Table 1 provides some strategies and considerations that address these challenges that were identified in the literature.[8,20,53,55-61] The list is not exhaustive and the details of how these strategies could be operationalized may be influenced by local context.

Table 1: Summary strategies to mitigate potential challenges of implementing ICT

Potential Challenge	Considerations/Strategies
Possible personal health information privacy breach. Personal health information may be read or received by other individuals, such as in scenarios where an email account or computer is shared. Electronic notification could become documented evidence of the index case having an STI if using client-led ICT.	• Consider working with website/app owners to optimize public health use of the app and consider privacy concerns. Send private messages to each contact, instead of a group message. • Some of these risks may not be unique to ICT and can be shared with conventional contact tracing methods. • If a website is being used to notify a case of a potential exposure to an STI, consider ensuring the website is password-protected, with a non-searchable link that is valid for a limited number of logins. Set up the website to delete the history or provide instructions to delete the browser history. • Indicate importance, but do not include specific information about the potential STI exposure. Examples of message headers include “Important Health Matter” or “Please Call Me.” Consider marking the email as ‘confidential’ if your email provider allows it.
Email or other online communication could be perceived as ‘junk-mail’ or spam and not read by the recipient.	• Use a professional email address and include details about the sender that can be validated. • Indicate importance, but do not include specific information about the potential STI exposure. Examples of message headers include “Important Health Matter” or “Please Call Me.” Consider marking the email as ‘confidential’ if your email provider allows it.
Pseudonyms are often used in SNS profiles, which makes it difficult to confirm the identity of the contact	• Client-led ICT may mitigate some of the challenges of public health-led ICT, in particular the challenge of confirming the correct contact was identified. • If safe and appropriate, cases may notify their sexual

Potential Challenge	Considerations/Strategies
during public health follow up.	contacts themselves and have them contact public health. Risks, such as the potential for negative reactions or violence, should be discussed if the case is doing the contact notification.
Unlike the real-time engagement that occurs with in-person or telephone communication, messaging via SNS or email might be one-way or subject to a delayed response if a contact and public health professional access the app/email at different times. Therefore, there is limited opportunity for counseling and ensuring linkage to care.	• Communicate by SNS to request the contact provide a phone number. • If possible, reach out to the individual using online communication, but provide specific information about the potential STI exposure by phone/in person. • If safe and appropriate, cases may notify their sexual contacts themselves and have them contact public health. Risks, such as the potential for negative reactions or violence, should be discussed if the case is doing the contact notification.

Discussion and Conclusions

Internet-based contact tracing for STIs is being used successfully in several jurisdictions to notify sexual contacts and identify new cases, leading to increased screening and treatment for STIs.[1-17] ICT could also complement standard notification methods and it may be particularly beneficial in the event of an outbreak in which sexual contacts used SNS to identify partners. ICT is valuable for both public health-led and client-led contact notification. Several jurisdictions have implemented ICT protocols and have reported success; however, the level of use of ICT and the types of internet partner services available to staff, e.g., Public Health SNS profiles, email etc., varies by jurisdiction.[1,2,53-55] Although there are risks and challenges to implementing ICT, the literature provides some strategies to mitigate risks (see Table 1). ICT has clear benefits when there is no other way of notifying partners of a potential exposure.

There are several limitations to the evidence we reviewed. It is difficult to compare the effectiveness of ICT to traditional contact tracing methods due to ICT's use in situations where there is no other way to contact the partner. The metrics for effectiveness vary across studies, if they report effectiveness at all. In general, there is a lack of high quality studies evaluating ICT using SNS and open email. The generalizability of the SNS studies is limited due to several of the study samples reflecting the concentrated epidemics of HIV and syphilis in MSM and specifically black MSM in the United States.[2-4,15] In terms of acceptability, the trends and preferences in digital technology change rapidly, making it difficult to gauge current acceptability; where one technology may be acceptable today, it may be less acceptable in the near future. Lastly, most of the evidence considered here is from outside of Canada and therefore may be less generalizable to the Canadian context. Local research is needed.

Implications for Practice

- Public health may benefit from collaborating with stakeholders e.g., Boards of Health, community physicians, STI/CD Program Managers, front-line staff, community groups, website/app owners to develop and implement ICT policies, procedures and evaluations.

- Public health staff using SNS for contact tracing require: training on the technology; access to websites with sexual content, which might normally be restricted at work; and access to smartphones with data to use SNS apps.
- Local ICT activities should be evaluated.
- Public health should anticipate additional expenses for smartphones with data, training, technical support and evaluations related to ICT.

Specifications and Limitations of Evidence Brief

The purpose of this Evidence Brief is to investigate a research question in a timely manner to help inform decision making. The Evidence Brief presents key findings, based on a systematic search of the best available evidence near the time of publication, as well as systematic screening and extraction of the data from that evidence. It does not report the same level of detail as a full systematic review. Every attempt has been made to incorporate the highest level of evidence on the topic. There may be relevant individual studies that are not included; however, it is important to consider at the time of use of this brief whether individual studies would alter the conclusions drawn from the document.

Additional Resources

- The CDC has created a toolkit for internet partner services, which includes ICT.

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