SYPHILIS AMONG GAY, BISEXUAL, TWO-SPIRIT AND OTHER MEN WHO HAVE SEX WITH MEN

A RESOURCE FOR POPULATION-SPECIFIC PREVENTION

PROTECTING CANADIANS FROM ILLNESS

Public Health Agency of Canada
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TO PROMOTE AND PROTECT THE HEALTH OF CANADIANS THROUGH LEADERSHIP, PARTNERSHIP, INNOVATION AND ACTION IN PUBLIC HEALTH.

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INTRODUCTION

Sexually transmitted and blood borne infections (STBBIs) continue to be a significant public health concern in Canada. Across Canada, infectious syphilis rates are on the rise. The majority of infections are among gay men and other men who have sex with men (MSM), a proportion of whom are co-infected with HIV. Individuals infected with syphilis are at an increased risk of acquiring HIV; in people living with HIV, syphilis can progress more quickly, be more difficult to treat, and increase the risk of onward HIV transmission.

This resource was developed to support public health professionals and community organizations in the development of evidence-based strategies for the prevention of syphilis among gay men and other MSM. A comprehensive review of the existing evidence on syphilis and other STBBI prevention interventions was conducted to inform the development of this resource.

The following sections provide a summary of key issues related to the prevention, diagnosis, treatment and management of syphilis. For detailed information and guidance on the natural history, transmission, prevention, screening, testing, and treatment of syphilis, consult the *Canadian Guidelines on Sexually Transmitted Infections*[1].

1. WHAT IS SYPHILIS?

1.1 NATURAL HISTORY

Syphilis is an infection caused by the bacterium *Treponema pallidum*. Syphilis is usually infectious for the first year, during the primary, secondary and early latent stages. Untreated syphilis may progress to a non-infectious late latent or tertiary stage of the infection that may lead to serious complications including damage to the central nervous system, cardiovascular system, eyes, skin and other internal organs. The progression of syphilis occurs over a period of 10–30 years, however the natural history of syphilis for gay men and other MSM who are infected with HIV can be very different, and syphilis infection can progress from stage to stage more rapidly.

1.2 TRANSMISSION

Syphilis is transmitted primarily through oral, vaginal or anal sex with someone with an active infection. It can be passed from person to person through direct contact with a chancre (primary stage) or rash (secondary stage). Chancres are painless and may not be visible while rashes do not usually itch and can also be difficult to detect. Symptoms for syphilis are generally mild to non-existent and will pass in time. It is possible for individuals to be infected and not be aware they have syphilis. Although less common, syphilis can also be transmitted through injection drug use, through broken skin on the body, and from mother to child during pregnancy.

Syphilis is infectious, or able to be passed from one person to another, in the first year after infection. After two years, it goes into a dormant or non-infectious state and is no longer able to be transmitted, but can still cause serious damage to the body tissues and organs[2].

1.3 DIAGNOSIS AND TREATMENT

Syphilis is diagnosed through a simple blood test. In some cases, a test may be done on the chancre. Infectious syphilis is reportable to local public health authorities in all provinces and territories. Men who are sexually active or have risk factors for syphilis infection should get tested regularly. Testing for other STBBIs, such as chlamydia, gonorrhea, and HIV should be done at the same time.

Syphilis can be treated with penicillin or other antibiotics. Recommended doses depend on the stage of syphilis infection and may differ for HIV-infected individuals. Among men who are HIV-positive, longer duration of treatment may be required. It is important that individuals follow up with a healthcare professional to make sure treatment has been successful[3].

1.4 SYPHILIS AND HIV CO-INFECTION

Gay men and other MSM infected with syphilis are at an increased risk of contracting and transmitting HIV due to the presence of sores which provide entry points for HIV to get inside the body. For example, for men who are HIV-negative, having syphilis can increase the chances of acquiring HIV by three to five times. For men who are HIV-positive, having syphilis can increase HIV viral load and therefore increase the risk of transmitting HIV to someone else[4].

Those who are HIV positive can develop more advanced stages (e.g. tertiary) of syphilis at any point during the course of infection and infection can be more difficult to treat[5]. As a result, in some cases, more rigorous therapy may be used for HIV-positive patients. Some of the complications experienced by gay men and other MSM co-infected with HIV include:

- weakened immune system and ability to treat syphilis
- multiple chancres, which may occur during the primary infectious stage, instead of one chancre as typically seen in people who are HIV-negative
- rapid progression to tertiary syphilis among those who are HIV-positive, which has been observed in some cases within a very short period of time (six months after infection with syphilis, as opposed to 10 to 30 years)
- higher risk of neurosyphilis during the infectious stages[6].

1.5 PREVENTION

Prevention and control of syphilis involves the same risk reduction strategies as many other STBBIs, including:

- consistent and correct use of condoms
- reducing the number of sexual partners
- avoiding sharing of injection equipment
- screening high risk populations
- treating infected individuals and ensuring that their partners are notified, tested and treated.

Correct and consistent condom use for all sexual activities including oral sex can reduce transmission of syphilis[7]. However, this may not eliminate the risk of transmission because a syphilis sore may be in an area not covered by a condom or dental dam[8].

While HIV prevention efforts among gay men and other MSM have been a public health priority for over three decades, there are challenges with applying HIV prevention strategies to syphilis prevention in the same population.

First, HIV and syphilis have different risk profiles for oral sex. HIV prevention messages have rarely focused on condom use for oral sex since this is considered a low risk activity for HIV transmission[9]. Condom use for anal sex is already relatively high among gay men and other MSM, and oral sex remains a common risk reduction strategy for many gay men and other MSM in the context of the ongoing HIV epidemic[10]. However, syphilis is readily transmitted through oral sex[11]. The low perceived risk of syphilis transmission and perception that oral sex is "safer" may contribute to gay men and other MSM's vulnerability to syphilis infection[12].

Second, while condom use can reduce the likelihood of syphilis transmission, the infection can still be transmitted through skin-to-skin contact[13]. Taken together, these caveats suggest that condom use is unlikely to offer the same magnitude of protection against syphilis as it does against HIV. Further, trying to achieve even higher rates of condom use than is currently the case, and adopting condom use for oral sex would be challenging as these strategies are unlikely to be acceptable to communities most at risk for syphilis[14].

Third, unlike HIV, syphilis can be cured. However, it is also possible to become re-infected with syphilis after treatment. Therefore, repeated testing is required even among those who have already been diagnosed (and treated and cured) in the past[15].

1.6 EPIDEMIOLOGY OF INFECTIOUS SYPHILIS IN CANADA

In Canada, infectious syphilis rates are on the rise. For years, there were fewer than 200 new cases of infectious syphilis reported each year (less than 1 per 100,000 people). Beginning in 2002, a sharp and steady increase in the number of new cases has been reported annually, with more than 1,750 cases in 2011 (5.1 per 100,000 people). This translates into a 232% increase compared to the number of reported cases in 2002[16].

The rate of infection is lower than for some other sexually transmitted and blood borne infections (STBBIs). For example, in 2010 the rate of reported cases of chlamydia was 277.6 per 100,000 people, and 33.4 per 100,000 people for gonorrhea[17]. However, reported rates of certain STBBIs are higher among certain populations. For example, chlamydia is highest among young, heterosexual women, which is a much larger population than gay men and other MSM. Therefore, the rate of infection of syphilis is a much higher burden for gay men and other MSM than chlamydia is for heterosexual women.

1.7 DYNAMICS OF SYPHILIS EPIDEMICS AMONG GAY MEN AND OTHER MSM

As is the case in many other industrialized countries, the syphilis epidemics that have emerged in urban centres in Canada since the early 2000s disproportionately affect men. The vast majority of those men are gay men or other MSM, and a proportion are HIV-positive.

Across Canada, the syphilis epidemics seem to be driven at least in part by a "core group" of gay men and other MSM that share certain characteristics[18]:

- Many of them are HIV-positive (up to half of syphilis cases in some urban centres).
- Many of them (both HIV-positive and HIV-negative men) have higher numbers of sexual partners.
- Many of these partners are anonymous (e.g. partners found through venues such as bathhouses) or "pseudonymous" partners (e.g. partners found through social media).

Some have argued that the rising rate of syphilis in the gay/MSM community in urban centres is caused by lower rates of condom use related to "prevention fatigue" or "condom fatigue", or the belief that HIV has become a manageable disease. However, in many contexts, including in Canadian urban centres, there has not yet been an increase in new HIV infections paralleling the increase in syphilis infections. Furthermore, reports show that rates of condom use in British Columbia have remained stable or even increased over the same period as the syphilis epidemic, meaning that other factors may be at play[19].

Certain risk-reduction strategies such as serosorting (the act of choosing a sexual partner with the same HIV-positive status) and strategic positioning (where the receptive partner is HIV-positive or has an unknown HIV status and his partner in the insertive role in anal sex is HIV-negative), which are often accompanied by condomless sex, may be driving syphilis infection among HIV-positive gay men. This could account for some of the cases of syphilis reinfection after successful treatment.

Reaching this "core group" of gay men and other MSM who are most at risk of syphilis infection presents clear challenges. They are often the most marginalized and their sexual partners are difficult to engage, since they may be "pseudonymous". Innovative and more intensive interventions may be required to reach these groups effectively.

2. RISK FACTORS AND DETERMINANTS OF HEALTH

There are many factors, beyond individual risk behaviour, that influence the vulnerability of gay men and other MSM to sexually transmitted and blood borne infections (STBBIs), including syphilis. This includes a range of social, economic and structural conditions that contribute to gay men and other MSMs' experiences of health and illness, choices available to them, and their ability to control and act on decisions to achieve positive health outcomes. An understanding of the underlying causes or determinants of health that impact the health of gay men and other MSM is important for effective syphilis intervention among this population.

For detailed information on the factors that impact resilience and vulnerability to STBBIs among gay men and other MSM, consult the *Population-specific HIV/AIDS Status Report: Gay, Bisexual, Two-Spirit and other Men who have sex with Men*[20].

2.1 HOMOPHOBIA, HETEROSEXISM, AND RELATED STIGMA AND DISCRIMINATION

Stigma and discrimination, including homophobia and heterosexism, are key drivers of vulnerability to syphilis among gay men and other MSM. Experiences of stigma and discrimination related to sexual orientation and internalized homophobia significantly contribute to poor mental health and mental illness among gay men and other MSM[21]. In particular, gay and bisexual men report higher rates of depression, anxiety, low self-esteem, loneliness, thoughts about and attempts at suicide than other men[22]. Poor mental health outcomes such as depression and anxiety have an impact on sexual risk behaviours such as condomless sex and substance use among gay men and other MSM, which can lead to infection with an STBBI such as syphilis[23]. Homophobia and heterosexism can create a social environment in which gay men and other MSM are less likely to self-identify or accept their sexuality, and can discourage them from accessing testing or treatment for STBBIs[24].

2.2 GENDER NORMS

Men are affected by gender expectations that may define their roles in relationships, encourage risk-taking behaviours or discourage them from seeking or accessing health services[25]. Furthermore, negative body image and pressures to conform to dominant body image ideals is associated with increased substance use, steroid use, extreme dieting, low self-esteem and depression[26]. Gender and sexual norms around masculinity also put transmen (individuals who were born biologically female but identify as male) who have sex with men at increased risk for STBBIs[27]. For example, sharing injection drug equipment such as needles to inject hormones or silicone places transmen at high risk for syphilis, hepatitis C virus and HIV transmission[28]. Transmen also have low perceptions of STBBI risk and face multiple barriers to accessing health services including physical exams and STBBI testing due to stigma and lack of awareness and knowledge of their unique health needs[29].

2.3 CULTURE

Culture is a key element of one's identity and can influence knowledge, skills and attitudes towards sexuality, individual sexual behaviour and health outcomes. Individuals who identify both with ethnocultural or racialized groups and as sexual minorities may experience multiple layers of stigma and discrimination that interact and increase their risk for poor physical and mental health[30]. For example, gay men and other MSM may experience racism from within the gay community and homophobia from within their ethnic community and the general public[31]. The multigenerational effects of colonization, discrimination and residential schools also have an impact on the health behaviours and experiences of homophobia and racism among two-spirit, gay and other Aboriginal MSM[32]. While culture can be a barrier to open discussions about sexuality and access to services, it can also be a source of strength and resilience[33].

2.4 SOCIAL SUPPORT NETWORKS

Social support from family, friends and communities has a large impact on an individual's sense of belonging and ability to cope with the stress and negative impact of stigma and discrimination[34]. For gay men and other MSM, it can play an important role in disclosure, medical adherence and retention in care[35]. For many gay men and other MSM, the Internet and social media are also important sources of social support, and have changed the way gay men access health information and meet their sexual partners[36]. At the same time, the Internet and social media can contribute to STBBI risk through facilitating anonymous and casual sex encounters and in some cases promoting condomless sex, which can increase opportunities for multiple partners and risk of contracting syphilis and other STBBIs.

2.5 SOCIAL AND PHYSICAL ENVIRONMENTS

Various social venues, including gay bars, the Internet, and bathhouses, offer opportunities for socializing and finding sexual partners within the gay community, which influence both social mixing patterns and vulnerability to STBBIs among gay men and other MSM[37]. Furthermore, social practices such as anonymous sex, alcohol and recreational drug use, and non-verbal communication that characterize sexual activities in gay bathhouses may be barriers to practising safer sex[38]. Access to supportive and safe environments where gay men and other MSM can socialize and access services free of homophobia or violence plays an important role in gay men's health.

2.6 ACCESS TO HEALTH SERVICES

Barriers to accessing health services, including homophobia, discrimination, geographical location and proximity of services, and lack of confidentiality or anonymity have an impact on the frequency and quality of care received by gay men and other MSM[39]. In particular, knowledge and attitudes of healthcare providers can pose a barrier to accessing sexual health services for gay men and other MSM[40]. Perceived stigma, discrimination and ignorance about the health needs of gay men and other MSM affect whether and how they access health information and services and the quality of services they receive.

3. THEORY OF STBBI PREVENTION

3.1 UPSTREAM, PRIMARY, SECONDARY AND TERTIARY STBBI PREVENTION

STBBI prevention activities can take many forms. Prevention activities are usually identified as upstream, primary, secondary or tertiary. A comprehensive STBBI prevention approach will address most or all four categories of prevention if it is to be effective in substantially reducing the burden of STBBIs.

Upstream prevention addresses the determinants of health (e.g., homophobia, discrimination, gender norms, socioeconomic status) that influence vulnerability to and resilience against sexually transmitted and blood borne infections (STBBIs). Primary prevention focuses on diminishing the spread of STBBIs by protecting uninfected persons from acquiring STBBIs through transmission routes such as condomless sexual intercourse or sharing drug use equipment. Secondary prevention refers to efforts to diagnose and treat STBBIs as early as possible in order to cure or slow the progression of each disease, prevent the progression to any latent co-infections, and reduce the likelihood of onward transmission. Tertiary prevention focuses on providing care and support to those living with STBBIs. The goal is to limit disease progression and improve the quality of life of those living with the diseases.

3.2 A MODEL TO GUIDE PRIMARY, SECONDARY AND TERTIARY SYPHILIS PREVENTION

One approach which has been proven to be effective for health professionals in modifying high risk sexual behaviour among multiple populations is the Information, Motivation, Behavioural Skills (IMB) model[41]. As its name suggests, the IMB model specifies that effective STBBI prevention interventions are based on three essential elements. Application of these three elements specifically to syphilis prevention is outlined below.

Information

The information component of an effective IMB-based syphilis prevention intervention provides participants with relevant knowledge and information regarding the transmission of syphilis and ways to prevent syphilis infection (e.g., condom use, reducing numbers of sexual partners) as prerequisites for reducing risk behaviours. It is important that the information provided is tailored to the age and literacy level of the recipients[42].

Motivation

Information by itself is not sufficient to achieve behaviour change. Intervention participants must also be motivated to act on the information they have learned. With respect to syphilis sexual risk reduction and testing, it is important that interventions take into account the specific needs and motivations of audiences and address barriers to prevention (e.g., low perceived risk, attitudes towards condom use, perceived social support) and intentions to engage in syphilis prevention behaviours (e.g. STBBI testing, partner notification)[43].

Behavioural skills

STBBI prevention programs are significantly less likely to reach their objectives without incorporating the necessary behavioural skills (e.g. perceived self-efficacy) to adopt the desired behaviour change[44]. The third essential component of an effective syphilis prevention intervention focuses on the behavioural skills necessary to reduce sexual risk behaviour and seek out testing and treatment. Effective syphilis prevention interventions not only identify and describe behavioural skills (e.g. condom use negotiation, risk communication), but also provide participants with the opportunity to rehearse them.

4. PROMISING PRACTICES IN SYPHILIS PREVENTION AMONG GAY MEN AND OTHER MSM

A key focus of HIV prevention efforts among gay men and other MSM has been the implementation of behavioural interventions that encourage consistent condom use for anal intercourse. Correct and consistent condom use for all sexual activities remains a primary means for preventing STBBIs including syphilis[45]. However, given that syphilis is easily transmitted through oral sex, and can be transmitted despite the use of condoms for anal sex, this approach alone may not be sufficient for syphilis prevention.

Developing new knowledge and expanding both the scope and understanding of emerging public health evidence and promising practices is important for an effective response to syphilis infection over the long term. This includes the systematic use of knowledge and rigorous program evaluation to identify knowledge gaps for researchers and to inform future cycles of program development to improve public health results.

4.1 INCREASING TESTING WITH A FOCUS ON PARTICULARLY HIGH RISK GROUPS

Canadian and international evidence demonstrate the need for enhanced testing for syphilis among the gay men and other MSM most at-risk. Based on the literature, this includes increased testing frequency (up to every three months) for HIV-negative gay men and other MSM at high risk, and adding syphilis testing as part of routine blood work for HIV-positive gay men and other MSM, given the significant rates of syphilis co-infection[46].

Public health and community partners have adopted strategies to increase testing in most jurisdictions facing a syphilis epidemic. Syphilis testing is generally available at sexual health clinics and through healthcare providers. Additional testing access points have been made available, including testing sites at venues frequented by gay men and other MSM (e.g., bars, bathhouses) and at community outreach sites (Box 1). Several jurisdictions have also recommended adding syphilis testing to routine blood work, as part of standard clinical care for HIV-positive gay men and other MSM[47].

BOX 1: Example of a community-based drop-in satellite testing clinic[48]

Hassle Free Clinic in Toronto offered a drop-in satellite testing clinic at AIDS Committee of Toronto (ACT) from 6:00–9:00pm each Thursday from February 14 through April 18, 2013. Rapid anonymous HIV testing and standard syphilis testing were offered. A total of 231 men accessed the clinic to undergo rapid HIV testing and, of these men, 60 men had a syphilis test. There was one confirmed HIV positive test, and four confirmed syphilis cases as a result of the clinic. The clinic attracted a wide diversity of men, and very positive comments about the clinic location, time, and the fact that it was a drop-in clinic, were noted in the evaluation forms. ACT agreed to undertake outreach and promotion for this special satellite clinic, with costs for promotional materials to be shared equally between ACT and Hassle Free Clinic. Outreach consisted of print, mobile app ads, social media outreach, postcards/posters and venue outreach.

However, even in situations where the "right" people (high risk HIV-negative and HIV-positive gay men and other MSM) get tested at the "right" frequency (up to every three months) through the "right" venues (during routine blood work for HIV-positive men; at either regular testing sites or at outreach sites for both HIV-negative and HIV-positive men), challenges remain in terms of testing and treatment. For example, diagnosing syphilis among these men, and subsequently treating and curing their infection means that they return to a susceptible state where re-infection can now occur. This can lead to a cycle of ongoing incidence within a pool of high risk men, a perverse effect of achieving frequent testing and treatment found in mathematical modelling. High rates of re-infection have been reported in several large urban centres[49]. This emphasizes the need for a comprehensive approach, including increased partner notification and increased awareness, to mitigate this effect.

4.2 INNOVATIVE APPROACHES TO PARTNER NOTIFICATION

Partner notification (PN) is a standard component of the public health response to STBBIs. Typically, this involves identifying the sexual partners of a person diagnosed with an STBBI (often referred to as the "index patient"). The sexual partners may be contacted by the index patient or by public health officials, with the goal of encouraging them to be tested and treated, if necessary[50].

However, due to the characteristics of recent syphilis epidemics, traditional PN strategies are challenging and may be unlikely to play a major role in addressing current syphilis epidemics among gay men and other MSM[51]. In this context, innovative strategies have been shown to be complementary to—and not meant as a replacement for—traditional public health approaches to PN. Internet-based partner notification (IPN) strategies use email and online outreach to notify potential sexual contacts of index patients. IPN has been shown to be effective in reaching a broader range of sexual contacts in a timelier and less resource-intense manner that is also more acceptable to the community. It has led to an increase in the number of sexual contacts identified and subsequently tested, who otherwise would not have been reached[52].

4.3 INCREASING AWARENESS THROUGH TARGETED SOCIAL MARKETING CAMPAIGNS

A number of jurisdictions across Canada and around the world have created social marketing campaigns aimed at raising syphilis awareness among gay men and other MSM. These have not always been evaluated. While some campaigns have had some measure of time-limited success, none have managed to achieve sustained decreases in rates of syphilis. However, there is clear evidence that the most effective campaigns share the following characteristics:

- they are carefully planned
- they adhere strictly to the principles of social marketing
- they are targeted to communities most at risk (i.e., gay men and other MSM, including a focus on HIV-positive members of the community)
- they are aimed at increasing syphilis testing among gay men and other MSM[53].

Some have suggested that the success of these campaigns is due to the simple, straightforward behavioural objective they have set for gay men and other MSM: getting tested for syphilis. They point out that successful campaigns have steered away from suggesting changes in sexual behaviour that gay men and other MSM are likely to find difficult and undesirable (e.g., adopting condoms for oral sex). Getting tested for syphilis is relatively easy, while modifying sexual behaviours through social marketing is relatively difficult. Instead of asking gay men to change their sexual behaviours, these campaigns encouraged them to adopt a new, easy health-seeking behaviour[54].

In Canada, there have been more than a dozen social marketing campaigns developed in collaboration with a range of partners, most of which have targeted gay men and other MSM:

- Syphilis is back (Ottawa/Toronto/Montreal 2004)
- Je suis Phil (Québec 2004–2005)
- Mieux vaut y voir (Québec 2007–2008)
- Attack of the Cursed Syphilis, in three iterations (Toronto 2010, and subsequently taken to the provincial (Ontario) level, and then national level)
- Look What's Back, a two-phase campaign (Calgary 2010)
- Don't you Get It/Plenty of Syph, a two-phase campaign (Alberta 2011)
- Respect Yourself (Northwest Territories 2011)
- Get on it (Toronto/Ottawa, 2011–2012)
- Syphilis—Who Knew? (Nova Scotia 2011–2013)
- Thehardfacts.ca (Nova Scotia 2013)
- What's Trending in Vancouver? (British Columbia 2013–2014)

Typically, campaigns have had some of the following objectives:

- reduce infectious syphilis incidence among gay men and other MSM
- raise awareness of the syphilis epidemic and other STBBIs
- raise awareness of transmission, symptoms, treatment, and complications
- raise awareness of impact of syphilis on HIV transmission and health implications for those who are HIV-positive
- raise awareness of where to get tested for syphilis
- promote regular syphilis testing
- encourage partner notification
- promote condom use

CASE STUDY 1: *Attack of the Cursed Syphilis* campaign (Toronto)[55]

The *Attack of the Cursed Syphilis* campaign was originally developed in 2010 by the AIDS Committee of Toronto (ACT) with additional elements by the Gay Men's Sexual Health Alliance (GMSH) and Due North Communications. The campaign was further developed and distributed provincially by the GMSH and nationally by CATIE.

GOAL

To raise awareness of continued high rates of syphilis infection amongst gay and bisexual men, increase knowledge about syphilis, syphilis testing, and the health impact of syphilis on HIV positive men and encourage men to seek testing for syphilis.

KEY COMPONENTS

The campaign creative was intended to use humour as a means of raising an uncomfortable topic for many gay men. It included print materials, a website (www.actoronto.org/syphilis), subway ads, condom packaging inserts and print and online advertising. Some materials were developed specifically for HIV-positive gay men. Visuals were purposely designed so as not to look like any current HIV/STI health advertising. The campaign ran from April to October 2010.

FINDINGS

Based on findings from pre- and post-campaign surveys, the campaign had an impact on increasing syphilis awareness and knowledge, including the ways in which it can be transmitted, its impact on those who have HIV, and where one can access testing. However, testing rates remained similar among survey respondents before and after the campaign, even though one-quarter of respondents said they got tested as a result of the campaign.

Social marketing generally can be defined as a research-informed, consumer-centred approach that promotes the benefits associated with a voluntary behaviour change rather than just promoting the behaviour itself. This is an approach that uses media, messages, and images in ways that have been used effectively in commercial advertising. Based on descriptions of previous campaigns, as well as social marketing literature, there is a nine-point guide for the development of an effective social marketing campaign designed to increase syphilis testing among highly sexually active gay men and other MSM (Box 2)[56].

BOX 2: Key components of successful social marketing campaigns to increase syphilis testing among highly sexually active gay men and other MSM[57]

1. **Objectives:** To increase testing and awareness. Objectives should be specific, measurable, attainable, realistic, and time limited.
2. **Market/formative research:** Key community informants and focus group testing should be conducted to prompt the target group's values, attitudes, and beliefs concerning syphilis risk and syphilis testing. Understand precisely the behaviour you want your audience to adopt and identify what barriers are preventing that behaviour from occurring. Market/formative research should occur prior to the development of messaging/materials and again prior to campaign implementation.
3. **Theoretical model:** Campaigns should be based on a theoretical model (e.g., the Information-Motivation-Behaviour model).
4. **Price:** Campaigns should take into account the "price" of the desired behaviour, or the psychosocial and physical consequences of enacting the desired behaviour. For most gay men and other MSM the "price" of being tested for syphilis is relatively low.
5. **Segmentation:** Break larger heterogeneous audiences (e.g., all MSM) into smaller segmented audiences (e.g., men who have never been tested) and develop campaign materials/messages that reflect each of the specific target groups' values, attitudes, and beliefs, focusing on current stage of behaviour change and the likelihood they will adopt the desired behaviour.
6. **Tag line/branding:** A basic, overarching theme focusing on the health behaviour in question. For example, tag line/branding such as "Stop the Sores" needs to appeal to the needs and values of the target audience.
7. **Materials/implementation:** In most cases, campaigns have used materials that included advertisements in gay and general public weekly newspapers, radio spots, banner ads and other online advertising, for example. In addition to raising syphilis awareness, the materials generally presented a logo, website, and phone number, as well as a statement encouraging syphilis testing.
8. **Placement:** Campaign materials were made available in venues and places where gay men and other MSM are most likely to access them (e.g., gay neighbourhoods, websites, phone apps, and commercial venues frequented by gay men such as bars, gyms, coffee shops).
9. **Evaluation:** Intercept survey techniques (e.g., respondents complete brief questionnaires at interviewer request in target neighbourhoods) have been the method of choice for evaluating syphilis testing social marketing campaigns. Campaign impact can be measured mid-course (e.g., six months after campaign has begun) and after the campaign has been completed (e.g., one to two years). The mid-course evaluation findings should result in adjustments to address any elements that are not working as anticipated. Campaign effectiveness can be evaluated by assessing respondent awareness of the campaign and self-reported syphilis testing in the previous six months.

5. LESSONS LEARNED

5.1 HIV AND STBBI PREVENTION: AN OVERVIEW OF THEIR RELEVANCE FOR SYPHILIS PREVENTION

A review of the existing evidence on the effectiveness of HIV and STBBI prevention interventions was conducted to inform the development of this resource. However, it is important to consider the challenges and limitations that remain when attempting to apply this evidence to syphilis prevention interventions among gay men and other MSM.

5.2 LESSONS LEARNED FROM INTERNATIONAL EXPERIENCES

International stakeholders have also undertaken a number of syphilis prevention efforts. As a result, there have been valuable lessons learned about what has and has not worked. Two case studies from Australia and the United States provide useful insights.

Australia

As part of efforts leading to the development of a National Gay Men's Syphilis Action Plan (NGMSAP), Australian researchers conducted complementary mathematical modelling and social research studies to explore the potential long-term impact of different interventions on syphilis prevalence among gay men and other MSM in the country. The mathematical modelling compared the impact of various interventions, including a short-term and long-term reduction in the number of gay men's sexual partners, as well as a short-term and long-term increase in condom use. They found that short-term reductions in number of partners and increases in condom use had a negligible impact in long-term syphilis trends. Only significant increases in condom use (80%) and decreases in number of partners, both sustained indefinitely, could have an impact on long-term syphilis rates[58].

However, the complementary social research indicated that such long-term changes in behaviour are unlikely to be adopted. This was especially true among the men who were deemed at greatest risk (those who had the highest number of sexual partners and the lowest rate of condom use). The idea of partner reduction in particular was not well received. According to this research, "many men, especially those at greatest risk, were resistant to, or saw as impractical, interventions which relied on substantial changes to gay men's sexual behaviour". They saw little incentive to further diminish their sexual pleasure beyond what they were already doing for HIV prevention, in order to avoid syphilis[59].

Research has shown that "unless condom use increases and the rate of partner change decreases at levels that are highly unlikely, there will be little impact on prevalence"[60]. The authors therefore suggest that other interventions should be pursued, including increased coverage and frequency of testing and treatment, improved partner notification, and chemoprophylaxis (use of medication to prevent infection) against syphilis, all of which was deemed more acceptable by participants in the social research study. Based on the findings of this research, Australia's NGMSAP has considered behaviour change as a lower priority and instead has begun to develop strategies to increase syphilis testing and to try chemoprophylaxis among gay men at high risk. The authors stress the need to reinforce current rates of condom use, in case the current syphilis epidemics escalate even further[61].

CASE STUDY 2: Australia's National Gay Men's Syphilis Action Plan (NGMSAP)[62]

The National Gay Men's Syphilis Action Plan (NGMSAP) was developed in 2009 in response to increases in testing and protective sexual behaviours but not in incidence of syphilis. In fact, the authors of the NGMSAP noted that "there is currently no evidence—nationally or internationally—of a sustained decline in notifications resulting from syphilis control measures undertaken in metropolitan communities of gay men in the last decade." They concluded that they were unlikely to control syphilis, even by bringing the current programmatic response to scale.

NGMSAP GOAL

To achieve a sustained reduction in the incidence of infectious syphilis in Australian gay men and other men who have sex with men by 2013.

NGMSAP TARGETS

- At least 90% of highly sexually active gay men (>20 partners per six months) are tested for syphilis/HIV at a minimum of once every six months by 2011.
- At least 90% of sexually active HIV-positive gay men are being routinely tested for syphilis with quarterly HIV monitoring by 2011.
- Dual syphilis/HIV testing is routine when undiagnosed gay men present for testing by 2011.
- Reduce the proportion of gay men who have never tested for STIs by 5% by 2011.
- Increase the number of sexual contacts tested and treated by 2011.

Priority #1: Screening/testing. Actions include revising current testing guidelines, identifying and removing barriers to more frequent testing, ensuring clinics have procedures to identify and test highly sexually active HIV-negative gay men and other MSM, and investigate the use of rapid syphilis tests.

Priority #2: Partner notification. Actions include incorporating Internet-based partner notification systems and focusing health promotion messages on improving partner notification rates.

Supportive priorities: Chemoprophylaxis (use of medication to prevent infection) and health promotion. Actions include starting a chemoprophylaxis trial as soon as possible, developing a nationally consistent approach to syphilis information and messaging for gay men and other MSM, and ensuring there is no erosion in current rates of condom use.

United States

In 1999, the Centers for Disease Control and Prevention (CDC) launched the *National Plan to Eliminate Syphilis from the United States*[63]. The plan identified key strategies including: expanded surveillance and outbreak response activities, rapid screening and treatment in and out of medical settings, expanded laboratory services, strengthened community involvement and agency partnerships, and enhanced health promotion. Since then, the CDC has released an updated plan to address and overcome emerging challenges.

CASE STUDY 3: Lessons learned from the National Plan to Eliminate Syphilis from the United States[64]

Although no overall evaluation of the 1999 National Plan was undertaken, the 2006 National Plan identified key lessons from the first five years of syphilis elimination efforts in the United States.

KEY LESSONS LEARNED INCLUDE:

- Integrate syphilis elimination with other STBBIs and HIV prevention and control programs, wherever possible.
- Apply locally available surveillance and research data to develop evidence-based strategies.
- Local syphilis elimination activities should be flexible enough to respond to rapidly evolving epidemics.
- Adopt a holistic approach to eliminating syphilis, which takes into consideration the social determinants of disease transmission.
- Provide high quality STBBI services.
- Engage and collaborate with communities and local private providers.
- Understand and develop strategies for the Internet.

CONCLUSION

A comprehensive approach to syphilis prevention takes into account the social, structural and economic factors that affect gay men and other MSMs' vulnerability to STBBIs and includes a combination of upstream, primary, secondary, and tertiary prevention interventions. Given the dynamics of syphilis epidemics among gay men and other MSM in many parts of Canada, and based on the available evidence, this would include:

- increasing testing frequency for sexually active gay men and other MSM, particularly for those most at risk (e.g., those with higher numbers of sexual partners, HIV-positive individuals)
- innovative approaches to partner notification to monitor the evolving epidemic
- increasing awareness about syphilis through targeted social marketing campaigns.

Elements of the Information, Motivation, Behavioural Skills (IMB) model can be applied to syphilis prevention programming among gay men and other MSM. Moreover, the systematic use of knowledge and rigorous program evaluation is important to identify knowledge gaps for researchers and to inform future cycles of program development to improve public health results.

ENDNOTES

(1) Public Health Agency of Canada. (2010). Canadian Guidelines on Sexually Transmitted Infections. Syphilis. Retrieved from www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/section-5-10-eng.php

(2) Public Health Agency of Canada. (2006). Frequently Asked Questions about Syphilis.

(3) Public Health Agency of Canada, 2010.

(4) Public Health Agency of Canada. (2008). Report on Sexually Transmitted Infections in Canada: 2008; Sheth, P., and Thorndycraft, B. (2009). Sexually Transmitted Infections and HIV Transmission. Retrieved from www.catie.ca/en/fact-sheets/epidemiology/sexually-transmitted-infections-and-hiv-transmission

(5) Public Health Agency of Canada, 2008.

(6) Zetola, N.M., and Klausner, J.D. (2007). Syphilis and HIV Infection: An Update. *Clinical Infectious Diseases, 44,* 1222–28.

(7) Koss, C.A., Dunne, E.F., and Warner, L. (2009). A systematic review of epidemiological studies assessing condom use and risk of syphilis. *Sexually Transmitted Diseases, 36*(7), 401–405.

(8) Hosein, S.R. (2014). Syphilis (factsheet). Retrieved from www.catie.ca/fact-sheets/infections/syphilis

(9) Public Health Agency of Canada. (2013a). HIV transmission risk: A summary of the evidence.

(10) Hottes, T.W., Lindegger, M., Consolacion, T., Wong, S., Lester, R., Montgomery, C., et al. (2013). Infectious Syphilis among gay, bisexual and other men who have sex with men in British Columbia, 2003 to 2012. British Columbia Centre for Disease Control.

(11) Public Health Agency of Canada. (2006). Frequently Asked Questions about Syphilis.

(12) Drummond, F., Guy, R., Kaldor, J.M., and Donovan, B. (2010). The Intersection Between HIV and Syphilis in Men Who Have Sex with Men: Some Fresh Perspectives. *HIV Therapy, 4*(6), 661–673; Fenton et al. 2008; Katz, K.A., Raymond, H.F., Bernstein, K.T., and Klausner, J.D. (2013). Knowledge, Attitudes, and Practices Regarding Syphilis Screening Among Men Who Have Sex With Men in San Francisco. *Sexually Transmitted Diseases, 40*(4), 318–322; Marcus, U., Bremer, V., Hamouda, O., Kramer, M.H., Freiwald, M., Jessen, H., et al. (2006). Understanding recent increases in the incidence of sexually transmitted infections in men having sex with men: changes in risk behavior from risk avoidance to risk reduction. *Sexually Transmitted Diseases*, *33*(1), 11–17; Page-Shafer, K., Shiboski, C.H., Osmond, D.H., Dilley, J., McFarland, W., Shiboski, S.C., et al. (2002). Risk of HIV infection attributable to oral sex among men who have sex with men and in the population of men who have sex with men. *AIDS, 16*, 2350–2; Zetola & Klausner 2007.

(13) Koss et al. 2009; Public Health Agency of Canada, 2006.

(14) McCann, P.D., Gray, R.T., Hoare, A., Bradley, J., Down, I., Donovan, B., et al. (2011). Would gay men change their sexual behavior to reduce syphilis rates? *Sexually Transmitted Diseases, 38*, 1145–1150.

(15) Hottes et al. 2013; Public Health Agency of Canada, 2006.

(16) Public Health Agency of Canada. (2014) *Report on Sexually Transmitted Infections in Canada: 2011.* Centre for Communicable Diseases and Infection Control.

(17) Ibid.

(18) Bellis, M.A., Cook, P., Clark, P., Syed, Q., and Hoskins, A. (2002). Re-emerging syphilis in gay men: a case-control study of behavioural risk factors and HIV status. *Journal of Epidemiology and Community Health*, *56,* 235–235; Wong, W., Chaw, J.K., Kent, C.K., and Klausner, J.D. (2005). Risk factors for early syphilis among gay and bisexual men seen in an STD clinic: San Francisco, 2002–2003. *Sexually Transmitted Diseases, 32*, 458–463.

(19) Fenton & Wasserheit 2007; Hottes et al. 2013; Mckay, A. (2010). Strategies To Reduce The Incidence Of Infectious Syphilis Among Men Who Have Sex With Men: A Literature Review And Analysis. Sex Information and Education Council of Canada (SIECCAN). Submitted to Toronto Public Health Planning and Policy. [unpublished].

(20) Public Health Agency of Canada. (2013b). Population-specific HIV/AIDS Status Report: Gay, Bisexual, Two-Spirit and other Men who have sex with Men.

(21) Burchell, A.N., Calzavara, L.M., Myers, T., Remis, R.S., Raboud, J., Corey, P., et al. (2010). Stress and increased HIV infection among gay and bisexual men. *AIDS, 24*(11), 1757–64; Public Health Agency of Canada 2013b; Ross, L.E., Dobinson, C., and Eady, A. (2010). Perceived determinants of mental health for bisexual people: A qualitative examination. *American Journal of Public Health, 100*(3), 496–502.

(22) Brennan, D.J., Ross, L.E., Dobinson, C., Veldhuizen, S., and Steele, L.S. (2010). Men's Sexual Health Orientation and Health in Canada. *Canadian Journal of Public Health, 101*(3), 255–58; Halkitis, P.N., Wolitski, R.J., and Millett, G.A. (2013). A Holistic Approach to Addressing HIV Infection Disparities in Gay, Bisexual, and Other Men Who Have Sex With Men. *American Psychologist, 68*(4), 261–273; Russell, S.T., Ryan, C., Toomey, R.B., Diaz, R.M., and Sanchez, J. (2011). Lesbian, gay, bisexual, and transgender adolescent school victimization: Implications for young adult health and adjustment. *Journal of School Health, 81*, 223–230.

(23) Calzavara L.M., Burchell, A.N., Lebovic, G., Myers, T., Remis, R.S., Raboud, J., et al. (2012). The impact of stressful life events on unprotected anal intercourse among gay and bisexual men. *AIDS and Behaviour, 16*(3), 633–643; Nakamura, N., and Zea, M.C. (2010). Experiences of homonegativity and sexual risk behaviour in a sample of Latino gay and bisexual men. *Culture Health and Sexuality, 12*(1), 73–85; Wong, C.F., Kipke, M.D., Weiss, G., and McDavitt, B. (2010) The impact of recent stressful experiences on HIV-risk related behaviors. *Journal of Adolescence, 33,* 463–75.

(24) Canadian AIDS Society. (2006). Gay Men's Health Fact Sheet Series: Gay Men and Health. Retrieved from www.cdnaids.ca/gaymenandmsm; Ryan, B., Brotman, S., and Rowe B. (2001). Access to care: exploring the health and well-being of gay, lesbian, bisexual and two-spirit people in Canada. In: Health Canada, editor. "Certain circumstances": Issues in equity and responsiveness in access to health care in Canada. Ottawa: Health Canada, 145–60.

(25) PEPFAR. (2013). *Addressing Gender and HIV/AIDS. U.S. President's Emergency Plan for AIDS Relief*. Retrieved from www.pepfar.gov/documents/organization/206633.pdf; Pulerwitz, J., Michaelis, A., Verma, R., and Weiss E. (2010). Addressing gender dynamics and engaging men in HIV programs: Lessons learned from Horizons Research. *Public Health Report, 125*(1), 282–292.

(26) Brennan, D.J., Craig, S.L., and Thompson, D.E. (2012). Factors associated with a drive for muscularity among gay and bisexual men. *Culture, Health and Society, 14(1),* 1–15; Brennan, D.J., Souleymanov, R., Asakura, K., and Members of the Imagine Men's Health Research Team. (2013). Body Image, Racism, and Well-being among Gay and Bisexual Men of Colour in Toronto: A Report of the Imagine Men's Health Study.

(27) Rowniak, S., Chesla, C., Rose, C.D., and Holzemer, W.L. (2012). Transmen: The HIV risk of gay identity. *AIDS Education & Prevention*, *23*, 508–520; Sevelius, J. (2009). "There's no pamphlet for the kind of sex I have": HIV-related risk factors and protective behaviors among transgender men who have sex with non transgender men. *Journal of the Association of Nurses in AIDS Care*, *20*, 398–410.

(28) Ontario HIV Treatment Network. (2010). Rapid Response Service. Rapid Review: Transgender Men's Sexual Health and HIV Risk. Ontario HIV Treatment Network, Toronto, ON.

(29) Kenagy, G.P. (2002). HIV among transgendered people. *AIDS Care—Psychological and Socio-Medical Aspects of AIDS/HIV, 14*(1), 127–134; Namaste, V.K. (1999). HIV/AIDS and female to male transsexuals and transvestites: results from a needs assessment in Quebec. *International Journal of Transgenderism, 31*(1–2).

(30) Ryan, B., Brotman, S., Baradaran, A., and Lee, E. (2008). The colour of queer health care: Experiences of multiple oppression in the lives of queer people of colour in Canada. In Brotman, S., and Levy, J.J. (Eds.), Intersections : cultures, sexualités et genres (pp. 307–336). Quebec: Presses de l'Université du Québec; George, C., Alary, M., Hogg, R.S., Otis, J., Remis, R.S., Mâsse, B., et al. (2007). HIV and ethnicity in Canada : Is the HIV risk-taking behaviour of young foreign-born MSM similar to Canadian born MSM? *AIDS Care—Psychological and Socio-Medical Aspects of AIDS/HIV, 19*(1), 9–16; Halkitis et al. 2013.

(31) Public Health Agency of Canada, 2013b.

(32) Balsam, K.F., Huang, B., Fieland, K.C., Simoni, J.M., and Walters, K.L. (2004). Culture, trauma, and wellness: a comparison of heterosexual and lesbian, gay, bisexual, and two-spirit Native Americans. *Cultural Diversity and Ethnic Minority Psychology, 10*(3), 287–301; Canadian Aboriginal AIDS Network. (2005). Addressing homophobia in relation to HIV/AIDS in Aboriginal communities: Final Report of the Environmental Scan 2004–2005. Ottawa: Author; Evans-Campbell, T., Walters, K.L., Pearson, C.R., and Campbell, C.D. (2012). Indian boarding school experience, substance use, and mental health among urban two-spirit American Indian/Alaska Natives. *The American Journal of Drug and Alcohol Abuse, 38*(5), 421–7.

(33) Brennan et al. 2013.

(34) Public Health Agency of Canada, 2013b.

(35) Ontario HIV Treatment Network. (2013). Rapid Response Service. Rapid Response: HIV Services in Rural and Remote Communities. Toronto, ON: Ontario HIV Treatment Network; Public Health Agency of Canada, 2013b.

(36) Chiasson, M.A., Hirshfield, S., Remien, R.H., Humberstone, M., Wong, T., and Wolitski, R.J. (2007). A comparison of on-line and off-line sexual risk in men who have sex with men: an event-based on-line survey. *Journal of Acquired Immune Deficiency Syndromes, 44*(2), 235–43; Ogilvie, G.S., Taylor, D.L., Trussler, T., Marchand, R., Gilbert, M., Moniruzzaman, A., et al. (2008). Seeking sexual partners on the internet: A marker for risky sexual behaviour in men who have sex with men. *Canadian Journal of Public Health, 99*(3), 185–188.

(37) Fenton, K.A., Breban, R., Vardavas, R., Okano, J.T., Martin, T., Aral, S., et al. (2008). Infectious syphilis in high-income settings in the 21st century. *Lancet Infectious Diseases, 8*(4), 244–253; Public Health Agency of Canada, 2013b.

(38) Haubrich, D., Ryder, K., Medved, W., Calzavara, L., and Myers, T. (2004). Gay and bisexual men's experience of bathhouse culture and sex: 'looking for love in all the wrong places'. *Culture Health and Sexuality, 6(1),* 19–29.

(39) Ontario HIV Treatment Network, 2013; Public Health Agency of Canada, 2013b.

(40) Ontario HIV Treatment Network. (2014). Rapid Response Service. Rapid Response: Facilitators and barriers to health care for lesbian, gay and bisexual (LGB) people. Toronto, ON: Ontario HIV Treatment Network.

(41) Anderson, E.S., Wagstaff, D.A., Heckman, T.G., Winett, R.A., Roffman, R.A., Solomon, L.J., et al. (2006). Information-motivation-behavioural skills (IMB) model: testing direct and mediated treatment effects on condom use among women in low-income housing. *Annals of Behavioural Medicine*, *31*(1), 70–79; Belcher, L., Kalichman, S., Topping, M., Smith, S., Emshoff, J., Norris, F., et al. (1998). A randomized trial of a brief HIV risk. *Journal of Consulting and Clinical Psychology, 66*(5), 856–861; Fisher, J.D., Fisher, W.A., Bryan, A.D. and Misovich, S.J. (2002). Information-motivation-behavioural skills model-based HIV risk behavior change intervention for inner-city high school youth. *Health Psychology*, *21*, 177–186; Jaworski, B.C., and Carey, M.P. (2001). Effects of a brief, theory-based STD prevention program for female college students. *Journal of Adolescent Health, 29*(6), 417–425; Kalichman, S.C., Cain, D., Weinhardt, L., Benotsch, E., Presser, K., Zweben, A., et al. (2005). Experimental components analysis of brief theory-based HIV/AIDS risk-reduction counseling for sexually transmitted infection patients. *Health Psychology, 24*(2), 198–208; Kiene, S.M., and Barta, W.D. (2006). A brief individualized computer delivered sexual risk reduction intervention increases HIV/AIDS preventive behavior. *Journal of Adolescent Health, 39*(3), 404–410.

(42) Public Health Agency of Canada. (2008). *Canadian Guidelines for Sexual Health Education* (3rd Ed.).

(43) Ibid.

(44) Ibid.

(45) Koss et al. 2009.

(46) Bissessor, M., Fairley, C.K., Leslie, D., Howley, K., and Chen, M.Y. (2010). Frequent screening for syphilis as part of HIV monitoring increases the detection of early asymptomatic syphilis among HIV-positive homosexual men. *Journal of Acquired Immune Deficiency Syndrome, 55*(2), 211–6; Branger, J., van der Meer, J.T., van Ketel, R.J., Jurriaans, S., and Prins, J.M. (2009). High incidence of asymptomatic syphilis in HIV-infected MSM justifies routine screening. *Sexually Transmitted Diseases, 36*(2), 84–85; Burchell, A.N., Allen, V.G., Moravan, V., Gardner, S., Raboud, J., Tan, D.H.S., et al. (2013) Patterns of syphilis testing in a large cohort of HIV patients in Ontario, Canada, 2000–2009. *BMC Infectious Diseases, 13,* 246; Cohen, C.E., Winston, A., Asboe, D., Boag, F., Mandalia, S., Azadian, B., et al. (2005). Increasing detection of asymptomatic syphilis in HIV patients. *Sexually Transmitted Infections, 81*(3), 217–219; Gray, R.T., Hoare, A., Prestage, G.P., Donovan, B., Kaldor, J.M., and Wilson, D.P. (2010). Frequent testing of highly sexually active gay men is required to control syphilis. *Sexually Transmitted Diseases, 37*(5), 298–305; Guy, R., Wand, H., Holt, M., Mao, L., Wilson, D.P., Bourne, C., et al. (2012). High annual syphilis testing rates among gay men in Australia, but insufficient retesting. *Sexually Transmitted Diseases,* 39(4), 268–275; Hottes et al. 2013; Leber et al. 2008; McKay 2010; Ogilvie et al. 2009; Tuite, A.R., Fisman, D.N., and Mishra, S. (2013). Screen more or screen more often? Using mathematical models to inform syphilis control strategies. *BMC Public Health, 13,* 606.

(47) Arumainayagam, J., Pallan, M.J., Buckley, E., Pugh, R.N., White, D.G., Morrall, I.A., et al. (2007). Syphilis outbreak in Walsall, UK: lessons for control and prevention. *International Journal of STD and AIDS, 18*(1), 55–57; Ciesielski, C., Khan, R.H., Taylor, M., Gallagher, K., Prescott, L.J., and Arrowsmith, S. (2005). Control of Syphilis Outbreaks in Men Who Have Sex With Men: The Role of Screening in Nonmedical Settings. *Sexually Transmitted Diseases*, 32(10), S37-S42; Hottes et al. 2013; Kerani, R.P., Handsfield, H.H., Stenger, M.S., Shafii, T., Zick, E., Brewer, D., et al. (2007). Rising rates of syphilis in the era of syphilis elimination. *Sexually Transmitted Diseases, 34*(3), 154–161; Lambert, N.L., Fisher, M., Imrie, J., Watson, R., Mercer, C.H., Parry, J.V., et al. (2005). Community based syphilis screening: feasibility, acceptability, and effectiveness in case finding. *Sexually Transmitted Infections, 81,* 213–216.

(48) Maxwell, J. (2013). Hassle Free Clinic @ ACT: Satellite HIV and Syphilis testing Clinic at ACT Evaluation Report.

(49) Garnett, G.P., Aral, S.O., Hoyle, D.V., Cates, W. Jr., and Anderson, R.M. (1997). The Natural History of Syphilis: Implications for the Transmission Dynamics and Control of Infection. *Sexually Transmitted Diseases*, 24(4), 185–200; Hottes et al. 2013; Ogilvie et al. 2009; Tuite et al. 2013; Whelan, M., and Raju, S. (2012). Epidemiology of Syphilis in Ontario, Presentation to the 2012 Guelph Sexuality Conference. Surveillance Services, Public Health Ontario.

(50) Hogben, M., Paffel, J., Broussard, D., Wolf, W., Kenney, K., Rubin, S., et al. (2005). Syphilis partner notification with men who have sex with men: a review and commentary. *Sexually Transmitted Diseases*, 32(10 Suppl), S43-S47.

(51) Arumainayagam et al. 2007; Ehlman, D.C., Jackson, M., Saenz, G., Novak, D.S., Kachur, R., Heath, J.T., et al. (2010). Evaluation of an innovative internet-based partner notification program for early syphilis case management, Washington, DC, January 2007–June 2008. *Sexually Transmitted Diseases*, 37(8), 478–485; Hottes et al. 2013; Hogben et al. 2005; Kerani et al. 2007.

(52) Ehlman et al. 2010.

(53) Hottes et al. 2013; McKay, 2010.

(54) McKay 2010; Plant, A., Montoya, J.A., Rotblatt, H., Kerndt, P.R., Mall, K.L., Pappas, L.G., et al. (2010). Stop the sores: the making and evaluation of a successful social marketing campaign. *Health Promotion Practice*, 11(1), 23–33.

(55) AIDS Committee of Toronto (ACT). (2011). Attack of the Cursed Syphilis: Syphilis awareness campaign targeting gay men in Toronto. Final Report. Retrieved from www.actoronto.org/research.nsf/pages/act.research.0379/$file/Syphilis%20campaign%20Report_March%202011.pdf

(56) McKay, 2010.

(57) Ibid.

(58) Gray, R.T., Hoare, A., Prestage, G.P., Donovan, B., Kaldor, J.M., and Wilson, D.P. (2011). Frequent testing of highly sexually active gay men is required to control syphilis. *Sexually Transmitted Diseases*, 37(5), 298–305.

(59) McCann et al. 2011.

(60) Wohlfeiler, D. (2011). What Difference Can We Make in Reducing Syphilis Among Gay Men? And How? *Sexually Transmitted Diseases*, 38(12), 1159–1160.

(61) Gray et al. 2011; McCann et al. 2011; Wohlfeiler, 2011.

(62) Australasian Society for HIV Medicine (ASHM). (2009). Australia's National Gay Men's Syphilis Action Plan (NGMSAP). Retrieved from www.ashm.org.au/images/pdfs/email_alerts/national_gay_mens_syphilis_action_plan.pdf

(63) Centers for Disease Control and Prevention. (1999). The national plan to eliminate syphilis from the United States. Atlanta, Georgia: U.S. Department of Health and Human Services, CDC, National Center for HIV, STD, and TB Prevention, 1–84.

(64) Centers for Disease Control and Prevention (2006). Together We Can: Syphilis Elimination Effort (SEE). The National Plan to Eliminate Syphilis from the United States.