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Young men who have sex with men – sexual health risks and potential public health interventions using smartphone applications

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Introduction

“Men who have sex with men” (MSM) is the term used to describe any man, irrespective of gender at birth, who engages in sexual intercourse with other men. There are an estimated 107,800 HIV-positive (HIV+) people living in the UK, with only 81,510 of those receiving HIV healthcare¹. Among them, 44,980 identify as MSM, with 17% being unaware of their HIV status¹. When comparing with men who identify as heterosexual (24,000), MSM have almost double the prevalence of HIV. 25% of newly diagnosed HIV+ MSM also have active sexually transmitted infections (STIs), such as chlamydia, gonorrhoea or syphilis¹. Young MSM (YMSM), between the ages of 15 and 24, represent a group that is at particular risk for new HIV infections. With the advent of anti-retroviral therapy (ART), HIV is considered by some to be a manageable and insignificant health burden to the individual, creating apathy surrounding infection. There is a steady, if not increasing, rate of condomless anal intercourse (CAI) among MSM in the UK, whose self-reported condom use in the last 6 months was 55% in 2010, this is obviously ineffective alone to reduce the incidence of HIV¹. This is reflected in the number of newly diagnosed YMSM in the UK within the last decade, which doubled from 8.7% in 2004 to 16% in 2013¹. Highlighting the need for new interventions to reduce the incidence and prevalence of HIV in YMSM. Although new biomedical interventions, such as pre-exposure prophylaxis (PrEP), represent effective methods, the NHS has yet to provide this service to MSM living in the UK. More effective public health strategies are therefore required to better address many aspects of HIV prevention, particularly in YMSM.

In this essay I will discuss YMSM as an at-risk population and how advances in technology such as smartphone dating applications (apps) have impacted their risk for contracting HIV. I will explore the evidence that supports the use of apps as public health

interventions, and highlight potential areas through which future efforts could be made to better service YMSM.

YMSM and risk of HIV

A study of high school students in the USA during 2005-2013, with an average annual sample size of 14,675, found that only 22% of all students who were sexually active had a HIV test, with only 17% of male students undergoing testing to date². YMSM engage in high-risk sexual behaviour, even when unaware of their HIV status. A survey of 3,492 YMSM in the USA revealed that 41% engaged in CAI in the last 6 months³. Another American survey of 991 HIV+ YMSM aged 12 to 26, provides some interesting insights into the behaviours of HIV+ YMSM⁴. Only 352 participants were 21 years of age or older, indicating a significant number of HIV+ YMSM between the ages of 12 and 20. Only 52% of participants were prescribed ART, 18% using ART for over 6 months, and 688 had a detectable viral load. This highlights the level of non-adherence to ART among YMSM. At least 45% of participants engaged in CAI, irrespective of their viral load being detectable or not. Substance abuse was associated with an increase risk in engaging in CAI (adjusted OR 1.14, 95% CI 1.04-1.25). YMSM with a detectable viral load, were more likely to have higher scores on depression and anxiety assessment scales and were less likely to be employed or to have high school level education. This is indicative of the psycho-social effects of HIV+ status and the impact it has on life outlook and opportunities. One limitation of this study is that it only surveyed HIV+ YMSM that are known to a healthcare clinic, thus it does not detail the general population or those that are unaware of their HIV status.

App use and sexual health risks

Part of the difficulty in engaging YMSM in public health interventions that they adhere to is due to cultural and behavioural differences from heterosexuals. MSM are increasingly using online methods, such as gay websites and apps to establish contact and meet sexual partners. Gay apps are among the most highly downloaded, with one app having at least 10 million downloads. This is of particular relevance in YMSM as they can contact a near limitless number of potential sexual contacts with great ease using a handheld-device. Some apps exist to promote CAI, encouraging group sex and substance abuse. In people who have poorly managed HIV and detectable viral loads, this creates the perfect storm for propagation of resistant HIV. On the other hand, more responsible apps allow users to add the date and result of their last HIV test that is viewable by members, highlighting its importance.

The use of apps for engaging in sexual contact is known to increase one's risk of contracting STIs. A study in the USA of 7,184 HIV-negative MSM assessed different methods of meeting sexual contacts, apps or internet sites, compared to "traditional" in-person social networking⁵. This study found that the use of apps increased the risk of contracting STIs such as chlamydia (OR 1.37, 95% CI 1.13-1.65) or gonorrhoea (OR 1.25, 95% CI 1.06-1.48), as compared to in-person meeting. However, there was no significant difference between either method when assessing HIV incidence ($P=0.10$). YMSM, aged <24 used apps as their preferred method for establishing sexual contacts and may be at particular risk for HIV infection when compared to older MSM (OR 0.57, 95% CI 0.35-0.92, $P=0.02$). Although this study did not report the rates of CAI, this can be inferred from the incidence of STIs. A systematic review of studies analysing 39,602 sexual encounters of MSM revealed that online sourcing had an increased rate of CAI (OR 1.24, 95% CI 1.01–1.52) when compared to offline methods, which was elevated in HIV+ MSM (OR 1.75, 95% CI 1.26–2.43)⁶.

Opportunity in risk – exploiting apps

Although meeting sexual contacts through gay websites and apps increases the risk of contracting STIs, apps also represent a new platform for public health interventions to specifically target a vast number of individuals who are most at risk.

Cooperation from app developers allows for messages, banners and other methods of advertising of sexual health information to be delivered. As these apps rely on geolocation technology, the information provided to the user can be tailored to their location. Providing details of their local sexual health clinic and access to sexual health resources, such as testing, treatment or advice. This information can be present at critical times during decision making in arranging new sexual contacts, such as planning to engage in CAI, while allowing individuals to express their autonomy with their sexual preferences. A Cochrane review of 15 randomised controlled trials of sexual health promotion using interactive computer-based interventions found that when compared to minimal interventions, that are used in standard practice, computer-based promotion significantly increased sexual health knowledge (Standardised Mean Difference 0.72, 95% CI 0.27-1.18), and had a positive effect on sexual behaviour (OR 1.75, 95% CI 1.18-2.59)⁷. These data demonstrate the effectiveness of such interventions, although further data need to be gathered with respect to biological outcomes, such as STI infection rates, to truly estimate the cost effectiveness. There is scarce but growing evidence for the effectiveness of using apps as a public-health intervention. Recent work by the Terrence Higgins Trust, who are spearheading the use of apps as an outreach method for YMSM in the UK, found that only 50% of HIV prevention organisations performing online prevention targeted apps. The use of apps is clearly a recognised, but so far under-exploited, resource for implementing public health interventions.

Apps can be used for delivery of sexual health information, but also to estimate knowledge of such information and attitudes towards it. PrEP awareness in HIV-negative MSM in the British Isles was assessed using an online and app-based survey⁸. 34.5% (132/386) were aware of PrEP, and 58.5% (226/365) were willing to use it if it was available. Interestingly, MSM who underwent STI testing every 6 months were more likely to be aware of PrEP (adjusted OR 2.89, 95% CI 1.54-5.42), indicating that engagement and exposure to sexual health interventions do play a role in education. The Adolescent Medicine Trials Network for HIV/AIDS interventions conduct PrEP clinical trials in 15-17 year old YMSM, recruiting participants to the trial using internet and app-based delivery methods⁹. This trial allows YMSM below the age of 18 to consent themselves for PrEP in order to reduce their risk of HIV infection. This rather controversial set of trials has met resistance to ethical approval in some sites due to the absence of parental consent. The rationale is that many YMSM that engage in high-risk sexual behaviour do so with their parents unaware of their sexual orientation, or they are homeless due to their sexual orientation. These situations make parental consent extremely difficult, and more importantly will distance potential participants from engaging in the trial or other public health interventions due to fear of parent involvement.

The utility of the app-based interventions can be further expanded upon whereby local sexual health clinics can use them as a platform for dissemination of information of services. The new digital sexual health service, Sexual Health 24 (SH:24), aims to improve access to sexual health services for 16-30 year olds in areas of London. Using the SH:24 website people can request free home-testing kits for STIs and receive the results via text message. In the case of positive test results, people are contacted by a healthcare professional. There are platforms to chat online with healthcare professionals to ask specific questions in an anonymous manner. This approach provides sexual health services and information at the finger-tips of the user, an effective strategy to target people in the modern age. This could be expanded to all of the UK

using a dedicated app, and even specifically target YMSM. A study investigating if personalised text message reminders for high-risk individuals – those who had a STI, were prostitutes, and/or MSM – could improve attendance to regular STI testing, 6 weeks after presentation to clinic, as compared to a control generic text message¹⁰. Personalised reminders increased re-attendance from 33% (90/273) in the control group to 56% (149/266; $P=0.0001$). This effect was marked for MSM, significantly increasing from 16% (3/18) in control to 58% (26/45; $P=0.006$). One obvious limitation of this study is the small number of MSM, particularly in the control group. Despite this, it does demonstrate that targeted electronic interventions can alter health-seeking behaviours in STI clinics and increase awareness of risk. Combining this with information of sexual preferences present within in apps, it could become a powerful tool to increase responsibility for one's sexual health, prompting testing and in-person interaction with healthcare professionals.

Summary

In the UK in 2013, 90% of people, irrespective of ethnicity and gender, diagnosed with HIV were being treated with ART, and of those 90% had achieved viral load suppression¹. Despite this there is still a steady rate of new HIV infections, particularly in YMSM. The use of smartphone apps as a method of public health engagement represents an important strategy to allow for far-reaching and yet more targeted information related to an individual's self-identified gender and sexual orientation to be disseminated. Accurate and relevant sexual health information can be specifically delivered to an individual in a confidential and private manner, increasing the likelihood of them reading such literature, and potentially changing sexual behaviours. I am unaware of any national effort to provide digital interventions for sexual health aimed specifically at high-risk populations such as YMSM.

In this essay I have reviewed the relevant literature on the risks associated with app use in YMSM, how this impacts HIV infection rates, and what sexual health outreach activities exist utilising apps. By exploiting the high use of apps among YMSM, we could better target and provide access to sexual health services to this high-risk population. I believe that app-based public health interventions represent the future of public health engagement and are powerful tools to be used to reduce the incidence of STIs, such as HIV.

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