

TARGETED PREVENTION AND CONTROL STRATEGIES FOR MSM AND IDU POPULATIONS CAN REDUCE STIGMA AND GLOBAL BURDEN OF HIV

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Introduction

HIV/AIDS is one of the deadliest epidemics in history. However, the global disease burden is not equally distributed. Intravenous drug users (IDU) and men who have sex with men (MSM) are among the most at risk populations for developing HIV/AIDS (UNAIDS, 2021). These groups face large amounts of HIV associated stigma; therefore, a focus on surveillance, preventative measures, and treatments for HIV within these two subpopulations will decrease the global burden of disease.

The HIV/AIDS epidemic is caused by the Human Immunodeficiency Virus. A diagnosis of HIV can progress into Acquired Immunodeficiency Syndrome (AIDS) as the virus attacks the immune system. Closely related to simian immunodeficiency virus (SIV), a virus found in Old World primates (Sharp & Hahn, 2011), HIV is thought to have emerged through repeated exposure to nonhuman viruses, namely SIV. Through these multiple transmission events, two genetically distinct HIV viral types emerged: HIV-1, and HIV-2. In addition to the genetic differences, the two HIV types have unique patterns of global distribution and pose different transmission risks. Globally distributed, HIV-1 has been shown to be more transmissible (Nyamweya et al., 2013).

Comparatively less transmissible, HIV-2 is also restricted geographically to individuals in western Africa (*Overview of HIV: Psychosomatic Medicine*, n.d.). The global distribution and high transmissibility of HIV-1 is what caused HIV/AIDS to reach epidemic levels (Sharp & Hahn, 2011), and will therefore be the focus of this review.

Since its discovery in 1981, the HIV/AIDS epidemic has been responsible for 25 million deaths globally (Simon et al., 2006; UNAIDS, n.d.). Fortunately, annual mortality has been decreasing in recent years due to medical advances, such as pre-exposure prophylaxes medications (Grant et al., 2010), new prevention strategies, such as needle exchange programs (Fernandes et al., 2017; Vlahov & Junge, 1998), an increase access to treatment, and by decreasing HIV stigma in the medical practice (Link & Phelan, 2001; Mahajan et al., 2008). Now, individuals are living with HIV long term and fewer cases are developing into AIDS, resulting in decreased AIDS-related deaths (Nizami et al., 2019; Weber et al., 2013). In 2013, the estimated count of people living with HIV continued to increase, but as more people received life-saving treatments, AIDS-related deaths decreased by 30%, further justifying additional research into HIV treatments (UNAIDS, n.d.).

Human to human transmission of HIV can occur both horizontally and vertically, through the exchange of, or contact with, infected bodily fluids (blood, breastmilk, pre-seminal fluid, semen,

rectal fluids, and vaginal secretions) (*HIV/AIDS*, 2021; Shaw & Hunter, 2012). Therefore, condomless sexual contact; sharing contaminated needles, syringes, or drug solutions; receiving unsafe blood transfusions or medical procedures; and experiencing accidental needle stick injuries (*HIV/AIDS*, 2021) are all factors known to increase the risk of contracting HIV. These factors heavily affect the MSM and IDU populations, increasing HIV risk substantially. A more thorough understanding of HIV in the MSM and IDU subpopulations would allow for more effective prevention and treatment methods to be implemented, resulting in lower HIV prevalence and decreased stigma.

Beyond the symptoms of the infectious disease, HIV+ individuals also face the intense pressure of living with their diagnosis, and the accompanying stigma this brings. Stigma is a social construct that can negatively impact an HIV+ patient. Building upon the work of Link and Phelan (2001), Mahajan and colleagues (2008) present a conceptual framework for HIV/AIDS related stigma that presents the social, political, and economic factors of power upon which stigmatization of a group can propagate. This framework can be used to explore the interrelatedness of the socio-cognitive and structural aspects of stigma within a defined population. Discrimination is a consequence of stigma, and is the result of inequitable power distribution in society (Parker & Aggleton, 2003). The effects of stigmatization, including discrimination, are compounded when the subpopulations of interest also experience pre-existing stigma, such as MSM and IDU.

Patterns of HIV within the Men Who Have Sex with Men Subpopulation

Historically, the MSM subpopulation has experienced a heavy HIV burden, seeing increased diagnoses, and facing more stigma and discrimination (Ekstrand et al., 2012; Herek, 1999). In 2018, men accounted for nearly 81% of all new HIV diagnosis in the United States, with 86% being MSM (gay, bisexual, and others) (CDC, n.d.). In addition to HIV case burden, the MSM community is still overcoming the stigma that developed when HIV was first reported in the United States in the early 1980s. The medical community named this new disease as GRID (Gay-Related Immune Deficiency) (Smith, 1998). The media portrayed this epidemic as a “gay plague” and as a result, a large amount of stigma against gay men and the MSM population occurred, with society placing blame on these men (Herek & Glunt, 1988).

The MSM population faces inter- and intrapersonal stigma from many levels of society, including the healthcare system, government, community (Link & Phelan, 2001; Mahajan et al., 2008). Stigma and discrimination create barriers to appropriate and necessary healthcare services (Beyer et al., 2011). For example, in the United States, HIV stigma has led to reluctance in Sexual Transmitted Infection (STI) testing, not disclosing HIV status to partners (thus aiding in the spread of the disease), and decrease in treatment of HIV/AIDS (Beyer et al., 2011). In predominantly Muslim countries, data on HIV incidence, prevalence and mortality is low because many government officials either do not report or under report HIV cases (Hasnain, 2005). Many individuals in the MSM population struggle with finding their place in society, preferring to keep their sexual orientations hidden. When they do reveal their sexual orientation, many lose respect and support from their friends and family (Feng et al., 2010).

A Review of Methods to Lower HIV in the MSM Populations

Prevention methods and treatment options are necessary to stop/slow the spread of HIV, especially in the MSM community. The stigma associated with being HIV positive in the MSM population has caused many men to fear disclosing their HIV status to medical professionals and researchers (Beyer et al., 2011; Rebe et al., 2019). As a result, the MSM population size appeared much smaller than it actually was and allotted funds for treatment and prevention research was decreased (Kaiser, 2015). To correct the unfair HIV burden in the MSM subpopulation, data-driven public health measures need to be implemented.

A critical measure for reducing HIV transmission is routine STI testing. In the United States alone, one in eight people are unaware of their HIV status (*HIV Testing* | NIH, n.d.), which contributes to increased transmission and decreased health outcomes for potential HIV+ individuals. In the United States, the CDC recommends all individuals 13 to 64 years of age be tested at least once during a routine health visit. For individuals belonging to high-risk populations, such as sexually active MSM, semi-annual testing is recommended (*HIV Testing* | NIH, n.d.). Once HIV status is confirmed, practices can be implemented to maintain a negative status, or treatments can be given to those who test positive.

Consistent and correct condom use and pre-exposure prophylaxis (PrEP) are two highly recommended public health methods that lower the transmission and acquisition risk of HIV. Consistent and correct condom use can lower HIV transmission via anal sexual contact between men by greater than 75% (Siegler et al., 2014). Condom use also lowers the chances of contracting other STIs, which can increase an individual's risk for both contracting and transmitting HIV to sexual partners (*HIV and Sexually Transmitted Diseases (STDs)* | NIH, n.d.). HIV negative individuals can take pre-exposure prophylaxis (PrEP), which reduces the risk of contracting HIV from a partner who is HIV positive, or from any other risky behavior that contributes to HIV, such as injecting drugs (Grant et al., 2010). Upon HIV diagnosis, antiretroviral therapy (ART) becomes a key strategy to decrease one's viral load to an undetectable level. Similar to condoms and PrEP, ART serves as both a preventive measure and a treatment, as if one's viral load is undetectable the risk of transmitting HIV to an HIV negative partner through sexual intercourse is lowered to almost zero percent (*The Basics of HIV Prevention* | NIH, n.d.).

Patterns of HIV Risk within the Intravenous Drug User Subpopulation

Despite known HIV risk, limited access to sterile needles and fear of arrest result in the use of shared needles in people who inject drugs (Fagher-Gangi et al., 2020). Increased HIV transmission can also occur within the IDU subpopulation due to delayed testing, which is commonly observed in this community (Paquette et al., 2018). IDUs can be found in 176 of the 206 established countries and territories (Cook et al., 2016) and more than one third of new HIV infections come from people who inject drugs in Eastern Europe, central Asia, the Middle East and North Africa (UNAIDS, 2018).

The societal stigma felt by marginalized populations, including IDU subpopulations, can further increase disease risk. Individuals who inject drugs are among the most marginalized population, often facing extreme prejudice in society and additional healthcare obstacles that continually increases HIV prevalence (Krüsi et al., 2010). A commonly held, stigmatized view is that drug users “got what they deserved” upon an HIV diagnosis (Ekstrand et al., 2012; Latkin et al., 2010). This societal pressure has been shown to decrease the healthcare seeking behavior within the IDU subpopulation (Muncan et al., 2020). Drug injectors who do seek treatment are typically met with varying forms of stigma in healthcare facilities, including a deprioritization in care (Paquette et al., 2018). Furthermore, 60% of European countries reported that health care professionals had negative and discriminatory attitudes towards people who inject drugs, which led to inadequate HIV prevention services (*The Status of the HIV Response in the European Union/European Economic Area*, 2016). Fear of incarceration can decrease participation in already limited public health initiatives, such as needle exchange programs. Even more so when police tend to target needle-distribution locations as places to make a drug arrest (UNAIDS, 2016a). Drug use or possession is a criminal offence in 67 countries worldwide (UNAIDS, 2013), resulting in almost 20% of incarcerated individuals being held on drug-related charges (*Harm Reduction: A Low-Cost, High-Impact Set of Interventions*, 2011). Incarcerated drug users face a different set of challenges with respect to HIV risk, namely a lack of access to clean needles (Levine, 2012). In 2015, only eight countries had clean needle or syringe exchange programs implemented in their prisons (UNAIDS, 2016b). Current legislation undermines harm reduction services in favor of punitive approaches (UNAIDS, 2018).

A Review of Methods to Lower HIV Prevalence in IDUs

Even though there are now groundbreaking treatments for people infected with HIV, the best strategy for ending the HIV epidemic is by implementing prevention methods. There are three main strategies for lowering the prevalence of HIV, specifically in people who inject drugs.

Decriminalizing drug use, a process that ends viewing drug use as a criminal offense, implementing needle and syringe programs, and increasing access to care.

Decriminalizing intravenous drug use has been shown to decrease HIV prevalence and transmission among drug users (UNAIDS, 2013). In 2000, when drug use was still illegal, Portugal had the second highest prevalence of HIV among people who inject drugs (Assuncao, 2019). In the ten years following the decriminalization of drug use in Portugal, HIV infections among IDUs fell by 50% (Assuncao, 2019). Without the inherent risk of penalty associated with intravenous drug use, it is likely that the IDU subpopulation will participate more freely in HIV prevention and treatment services (UNAIDS, 2016a). Decriminalizing drug use and possession will decrease the stigma and discrimination that many HIV+ drug users face, therefore increasing the perception of community support, and encouraging the IDU subpopulation to seek testing, treatment, and care (UNAIDS, 2019).

Needle sharing is a major driver of HIV transmission among IDUs. Needle-syringe exchange programs (NSP) are social services that provide sterile needles to injecting drug users for little to no cost (NICE, 2014). By providing sterile needles, individuals are less likely to share needles, therefore

lowing the risk of contracting or transmitting HIV. Following the success of the first NSP in the Amsterdam in the 1980's, programs have slowly been introduced into other countries (Fernandes et al., 2017). In 2016, NSPs were only available in 90 of the 158 countries that reported injecting drug use (UNAIDS, 2016a). Opponents of the programs believe implementation implies the encouragement of illicit drug use though this belief has little empirical evidence to support it (Vlahov & Junge, 1998). NSPs have actually been shown to lower both financial and health-related burdens (*Summary of Information on the Safety and Effectiveness of Syringe Services Programs (SSPs)*, 2021). For example, in addition to lowering the number of new HIV infections and preventing AIDS-related deaths (Vlahov & Junge, 1998), participants in NSPs are three times more likely to stop using drugs altogether (*Summary of Information on the Safety and Effectiveness of Syringe Services Programs (SSPs)*, 2021).

Access to care is an important aspect for combating disease outbreaks, especially in rural and low-income areas. The IDU population in North Carolina faced an HIV outbreak in 2017, prompting officials to identify primarily rural and low-income counties in the Appalachian region as facing exceptionally high transmission risk (Samoff et al., 2020). Rapid identification of the index cluster and subsequent contact tracing ensured that every person linked to the outbreak received medical care to achieve and maintain viral suppression (Samoff et al., 2020). Though successful, this monumental public health effort is anomalous, even in resource-rich areas of the world. In the United States, limited access to healthcare and low levels of insurance coverage have hindered HIV elimination efforts (Lewis et al., 2020). Increased access to care, not only in the United States, but also in other regions of the world is crucial to ending this epidemic.

Case Studies: Successful Strategies that Reduce HIV Burden in Vulnerable Subpopulations

Asian countries have recently seen a disproportionate amount of HIV cases related to IDUs. While most countries have stable or decreasing HIV incidence, Asian countries are seeing an increase in the number of new infections. In China, 42% of the cumulatively reported HIV/AIDS cases are directly related to injected drug use (Qian et al., 2006). Similarly, the sharing of contaminated needles and syringes has fueled an Indonesian epidemic. In 2006, Indonesia's IDU subpopulation accounted for less than 1/10th of 1 percent of the population but accounted for 63% of all HIV infections. Over 85% of the new infections resulted directly from injecting, with the remaining cases resulting from sexual contact with an HIV+ drug user (Morineau et al., 2012). The impact of the IDU subpopulation on HIV burden is apparent, making it crucial that public health measures and interventions are able to target the IDU subpopulation specifically.

The HIV burden of a single subpopulation can impact disease distribution for an entire country. Prior to 2011, the HIV epidemic was relatively stable in Greece. Following an economic recession, Greece experienced a significant outbreak of HIV infections among IDUs in Athens. (*Risk Assessment on HIV in Greece*, 2012). In 2012, IDUs became the most infected population of HIV infected individuals, accounting for 41% of all reported infections (Fotiou et al., 2012). The number of HIV infections for other routes of transmission (MSM, heterosexual contact, and undetermined) remained constant during this outbreak (*Risk Assessment on HIV in Greece*, 2012). This demonstrated

how a change in HIV trends for just one subpopulation can impact the entire country's disease distribution.

It has been shown that using a combined approach to HIV control and prevention is more effective in lowering HIV/AIDS burden than implementing a single strategy (Rebe et al., 2019). Although these combined approaches are effective across an entire population, targeted interventions are a necessary component to address the disproportionate burden held by the most at-risk subpopulations. A simulation study of the MSM population in South Africa explored one such implementation, looking at the potential impact of greater coverage of both ART and PrEP, improved counseling and condom promotion, and increased testing capacity (Brookmeyer et al., 2014). The study assessed efficacy of different combinations of the four strategies, and found that using all four strategies in tandem prevented over 34% of infections over 5 years in the MSM subpopulation (Brookmeyer et al., 2014).

Conclusion

HIV/AIDS is one of the worst epidemics in modern history, resulting in nearly 38 million deaths since the discovery of the disease in the 1980s (UNAIDS, 2021). Though uniformly devastating to anyone who develops symptoms, two subpopulations share the disproportionate burden of infection and disease: men who have sex with men and intravenous drug users. These populations have experienced stigma that has resulted in fear of getting tested, seeking medical care, and receiving treatment. Reducing and eliminating stigma faced by these two groups would reduce the transmission of HIV, thus lowering the global burden of disease. It is important to acknowledge that since the discovery of HIV in the 1980s, the global community has made great strides in its prevention, treatment, and overall knowledge of this disease, and because of these gains many lives have been saved. The World Health Organization aims to eliminate HIV in the United States and other countries by 2030 by continued emphasis on targeted public health efforts and funding for antiretroviral therapy and PrEP (*Overview | HIV.Gov*, n.d.). Recently, many countries have focused on improving access to treatment for HIV+ individuals, especially within the MSM and IDU communities (Assuncao, 2019; Brookmeyer et al., 2014; Siegler et al., 2014). While this is an important consideration, it is imperative for countries to also invest in data-supported prevention methods. The combination of proactive prevention strategies and reactive treatment options can collectively reduce the global HIV burden in the MSM and IDU population.

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