A Review of Risk and Protective Factors in Men who have sex with Men and Transgender Women who Inject Drugs

by

Casey Madden

Bachelor of Science in Information Science, University of Pittsburgh, 2016

Submitted to the Graduate Faculty of the

Department of Behavioral and Community Health Sciences

Graduate School of Public Health in partial fulfillment

of the requirements for the degree of

Master of Public Health

University of Pittsburgh

2022

UNIVERSITY OF PITTSBURGH

GRADUATE SCHOOL OF PUBLIC HEALTH

This essay is submitted

by

Casey Madden

on

May 17, 2022

and approved by

Essay Advisor: James Egan, PhD, MPH, Associate Professor, Behavioral and Community Health Sciences, Graduate School of Public Health, University of Pittsburgh

Mary Hawk, DrPH, LSW, Associate Professor & Vice Chair for Research, Behavioral and Community Health Sciences, Infectious Disease and Microbiology, Graduate School of Public Health, University of Pittsburgh

A Review of Risk and Protective Factors in Men who have sex with Men and Transgender Women who Inject Drugs

Casey Madden, MPH

University of Pittsburgh, 2022

Abstract

Men who have sex with men (MSM) and transgender women (TGW) have higher rates of intravenous drug use (IVDU) than their cisgender, heterosexual peers. The intersection of MSM/TGW identity and IVDU is of public health relevance because IVDU is associated with higher risk of acquiring HIV and Hepatitis B and C, higher risk of being the victim of violence, higher risk of mortality, and more. Although literature focused on the intersection of MSM/TGW IVDU is limited, research on MSM/TGW and research on IVDU as separate subgroups is plentiful. This research can be synthesized to predict what risk factors and protective factors MSM/TGW IVDU encounter. By synthesizing current research and identifying where the largest gaps in research exist, interventions can be designed to help improve health outcomes amongst men who have sex with men and transgender women who inject drugs (MTID).

Table of Contents

List of Tables

1.0 Introduction

There is a large body of literature demonstrating that, for a variety of reasons, people who identify as lesbian, gay, bisexual, and/or transgender (LGBT) generally experience poorer physical and mental health outcomes than heterosexual, cisgender people.[1,2] A separate but equally vast body of literature demonstrates that people who inject drugs (PWID) experience poor health outcomes.[3,4] It is essential that vulnerable key populations (KPs) be identified so that interventions may be designed and implemented to reduce the health inequities leading to poor health outcomes in these KPs.

Equally important to identifying individual KPs is the task of identifying the intersections of vulnerable KPs and evaluating how a person's intersecting identities inform the risks they face and the protective factors they benefit from.[5] Research shows that people who identify as MSM/TGW are more likely to use drugs intravenously than heterosexual, cisgender people.[6–8] With a clear intersection of these KPs identified, further research can be done to analyze risks and resiliencies in MTID so that targeted and effective interventions may be designed for this intersectional KP.

2.0 Risks Faced by LGBT PWID

2.1 HIV Related Risk

The CDC has labeled MSM and PWID as populations with a high risk of contracting HIV.[9] The CDC came to this conclusion based upon the number of HIV risk taking behaviors observed in each of these KPs. These behaviors include activities such as: having unprotected intercourse or unprotected anal intercourse, having multiple sexual partners within the last 6 months, binge drinking, injecting drugs, and having experienced an STI in the last 12 months. Raymond et al found that "high risk" heterosexual, cisgender people exhibit significantly more HIV risk taking behaviors than MSM and PWID, but still have a lower prevalence of HIV. This finding is significant because it implies that the behaviors MSM and PWID such as unprotected anal intercourse and sharing needles carry a significantly higher risk of HIV infection than behaviors that high risk heterosexuals engage in such as unprotected vaginal intercourse, having many sexual partners, having partnerships with large age gaps, and high cocaine and methamphetamine use. In other words, MSM who inject drugs are taking part in two of the activities most likely to result in an HIV infection.

Transgender women are some of the people most likely to contract HIV in the world. One systematic review of HIV in TGW found that worldwide, nearly 1 in 5 transgender women has HIV.[10] Some research has been done to explain how transgender women are becoming infected with HIV.[11] Truong et al examined and mapped out the social networks of transgender women who contracted HIV. Their research found that two common risk factors for TGW contracting HIV are injecting drugs, and having PWID in their social networks. Additional research has shown that

people who report having transgender sexual partners are more likely to be PWID.[12] These findings all indicate that transgender women are more likely to inject drugs, and more likely to associate with people who inject drugs, both of which contribute to their high prevalence of HIV infection.

2.2 Mortality

Some research has indicated that MTID have higher mortality rates than PWID who are not MSM or TGW.[13] Davis et al examined various risk factors and how they affected the mortality rate of PWID. The study concluded that there is an increased risk of mortality for PWID who identify as lesbian or gay. There are a number of things that could contribute to this higher mortality rate including: PWID who identify as LGBT having a higher risk for suicide attempts, a high likelihood of smoking tobacco, and frequent incidences of binge drinking. The study goes on to say that another possible factor in the heighted mortality rate is the compounded social marginalization experienced by people who are both homosexual and use intravenous drugs.

Another study that analyzed predictors of accidental fatal drug overdoses among PWID found that identifying as bisexual significantly increased one's risk of experiencing a fatal overdose.[14] The study also found that daily use of amyl nitrate (also known as "poppers"), a drug that is popularly used by MSM, was a predictive factor in fatal overdoses. Both of these conclusions offer potential evidence as to why MSM PWID experience a higher mortality rate than cisgender, heterosexual PWID. Both studies note that although their findings are foundational and significant, little research has been done on the mortality among MSM PWID and more research needs to be conducted.

One of the few studies that examined the potential of transgender identity to be a factor in the predictor of overdoses found that transgender heroin users were nearly twice as likely to report a recent overdose than cisgender men and women.[15] Seal's study additionally supports the work of Davis and O'Driscoll. They found that identifying as bisexual was "significantly associated with increased odds of recent overdose." The study additionally found that identifying as gay or lesbian correlated to increased odds of a recent overdose in recruited heroin users, but the increase in risk was not as significant as it was in bisexual identified individuals.

This research supports the idea that MTID face significantly higher risk of mortality than cisgender, heterosexual PWID. Unfortunately, the research also limited in several key ways. These studies on LGBT IVDU mortality were conducted in the San Francisco Bay Area, King County in Washington State, and Denver, Colorado. The Bay Area and Denver are both very urban, metropolitan areas. King County is the most populous county in Washington and contains the city of Seattle. Rural MSM/TGW who inject drugs are virtually unexamined in this body of research. Additionally, Seal and O'Driscoll collected their data in the 90s. Since 1999, the number of opioid overdose deaths have increased significantly in America.[16] The lack of more recent research on this topic may be obscuring an even higher level of risk of mortality associated with MTID.

2.3 Risk of Experiencing Violence

IVDU and people who identify as LGBT are at a significantly higher risk of experiencing physical and sexual violence than the population at large.[17–20] One study on the topic observed that, "dramatically heightened rates of violence have been observed among injection drug users."[19] The study went on to examine how gender, drug use behaviors, and environmental factors affected

risk of violence and type of violence experienced by participants. Men in the study cohort were "more likely to be attacked by strangers and police" while women were more likely to experience violence from "acquaintances, partners, and individuals involved in the sex trade." The researchers suggested that women who inject drugs experience violence from people they know more often than men, because men typically occupy a greater position of power in the hierarchy of the drug world. They frame this hierarchical violence as a result of social, economic, and structural gender inequalities. They conclude their research by arguing that recent evidence further supports their conclusion that women are at a higher risk of violence and death because of their lower position of power in the drug world hierarchy.[21]

Another study that examined prevalence of sexual violence in a cohort of PWID found that PWID are at a higher risk than someone who has never injected drugs to have experienced sexual violence.[20] This study too found a disparity between the experiences of men and women. Women who inject drugs were almost 4 times as likely to report having experienced sexual violence than men who inject drugs. The framing offered earlier to understand the disparity between violence faced by PWID of different genders offers an explanation for why female PWID experience sexual violence at such a higher rate than male PWID. The social, economic, and structural hierarchies present in the drug world and in society as a whole make woman more vulnerable to violence. It is also important to keep in mind that women and men who inject drugs both experience sexual violence at a rate higher than the general public.

Similarly to PWID, people who identify as MSM/TGW also experience physical and sexual violence at a higher rate than the general public.[17,18] Flores et al was one of the first studies to compare the rate at which LGBT identified people experience violence to that of cisgender, heterosexual people. Their analysis found that LGBT identified people are over 3.5 times more

likely to be the victim of violence than people who do not identify as LGBT. Additionally, LGBT people reported experiencing higher rates of what the U.S. Bureau of Justice Statistics defines as "serious violence." Serious violence includes acts of violence such as rape, robbery, and aggravated assault. They also found that LGBT people were more likely to experience violence involving a weapon, and violence that results in serious injury. Similar to the female participants in Marshall et al, results also indicated that anyone identifying as MSM/TGW is significantly more likely to experience violence from someone they report knowing "very well" as compared to cisgender, heterosexual people. The authors state in their discussion that they have described the disparities between LGBT and cisgender, heterosexual experiences of violence, but they have not explained why this disparity exists. They offer anti-LGBT prejudice as a potential explanation for these high rates of violence.

More research needs to be done to identify the root causes of the high rate of violence experienced by PWID and MSM/TGW. The above research suggests further studies on structural inequities and prejudice may offer explanation as to why PWID and MSM/TGW experience higher rates of violence. The findings on risk of experiencing violence among each subgroup offer insight into where intervention is needed, and also raise the question of whether MTID experience an even higher rate of violence than the PWID and MSM/TGW as individual subgroups. If the plausible explanation of increased violence amongst women PWID due to structural inequities and prejudice is correct, this model may apply to MSM/TGW as well. MSM/TGW face many similar structural inequities to women such as being economically and socially disadvantaged.[22] These economic and social disadvantages place MSM/TGW on a lower position of power in the hierarchy of the drug world, potentially leading to higher risk of violence and mortality. More research must be

conducted in this area to determine if specialized interventions targeting MTID would be an efficacious strategy in reducing the risk of violence that MTID experience.

2.4 Barriers to Accessing Healthcare

Delaying access to healthcare is associated with higher mortality.[23] A myriad of barriers to healthcare exist for MSM/TGW and PWID.[24–26] This may be another area where the intersection of marginalized identities compounds and increases the odds of negative health outcomes in MTID.

Current research shows that both self-reported and perceived physician bias is a barrier to adequate care for MSM/TGW and PWID. One study[27] examined whether physician bias about MSM/TGW affected the quality of care they delivered. It found that physicians self-reported constraints in the taking of a patient's history, embarrassment, and a lower perceived capacity to influence the risky behaviors that MSM/TGW patients report engaging in. Over one quarter of physicians who participated in the study indicated that they "felt uncomfortable" in dealing with MSM patients. Physicians were additionally asked about their comfort levels with PWID, which yielded similar results. The study ultimately concluded that "discomfort is clearly associated with the type of care that is delivered." One limitation of this study is that the researchers were specifically looking at outcomes related to people who presented for STI testing and treatment. Findings may not be generalizable to other forms of care administered by physicians, and more research must be done in what effect bias has on the care MSM/TGW and PWID receive.

Even in the case of unbiased physicians, perceived biases present one of the largest barriers to accessing healthcare for PWID.[25] A study on the barriers to accessing healthcare experienced

by PWID found that 48% of the cohort believed they did not receive necessary care when they visited a physician and 71% reported not getting medical care when they thought they might need it. Presented with a list of barriers to rank from most influential to least, 22% of participants selected "judgment by clinicians" as their most influential barrier. Judgment by clinicians was selected twice as often as any other barrier listed. As noted above, these perceived biases are not unfounded. The idea that clinicians are uncomfortable working with PWID is supported by the findings of a 2018 study that showed over half of emergency physicians surveyed admitted to a preference against working with patients who use substances and have pain.[28] A 2016 study also found that primary care physicians perceived people who use opiates more negatively than people who don't.[29] The existence and perception of biases and prejudices in healthcare leads to PWID and MSM/TGW delaying access to care, and may result in poorer care when they do seek it.

In addition to cultural and stigma-based barriers, logistical barriers also prevent MTID from accessing care. LGBT individuals are less likely than cisgender, heterosexual people to have adequate healthcare coverage.[30] This leads to a higher rate of reported unmet medical needs among MSM/TGW. Circling back to the Miller-Lloyd study on PWID and their barriers to accessing care, 59% of PWID respondents reported not seeking medical care due to not having insurance. Fifty-eight percent reported not seeking care due to overall cost.[25] One possible explanation for the lack of adequate coverage amongst MSM/TGW people and PWID is workplace and hiring discrimination. Higher rates of unemployment are correlated with lower rates of insurance coverage.[31] This is yet another area where the intersection of marginalized identities and the resultant compounded stigma may be resulting in a higher level of risk. In this case, an even higher percentage of unemployment among those at the intersection of MTID than those who do not identify both as MSM/TGW and PWID.

3.0 Potential Protective factors Among LGBT IVDU

3.1 HIV Related Protective Factors

MTID may exhibit some protective factors in regards to the detection and treatment of HIV as compared to cisgender, heterosexual PWID. A study that compared rates of late HIV diagnoses among MSM and PWID found that MSM are significantly more likely to learn they acquired HIV within 12 months of their exposure than PWID.[32] One proposed reason for this is that MSM get tested for HIV more often than non-MSM PWID. This is a crucial finding because, as the study states, "understanding trends in recent HIV infections is increasingly important in order to inform efforts to more effectively and completely monitor the epidemic, allocate resources, and plan and implement programs to prevent the spread of HIV." In other words, because MSM are more visible to current HIV surveillance programs, they may be more likely to benefit from the development of interventions directly tailored to their community. Additionally, earlier detection of HIV is associated with better health outcomes than late detection.[33–35] It stands to reason then, that MSM PWID will get tested for HIV earlier, receive a positive diagnosis earlier, and will be able to begin antiretroviral treatment earlier, leading to improved long term health outcomes as compared to non-MSM PWID.

One limitation of Wand et al is that the study was conducted in Australia, and the study claims that "Australia's HIV/AIDS surveillance system is considered to be one of the best in the world." Countries with different HIV surveillance, detection, and treatment infrastructure may not be seeing the same disparities in testing that Australia is.

The hypothesis that MSM are getting HIV testing more frequently than PWID is supported by a 2017 study that examined the average interval between HIV tests in high risk populations in the United States.[36] The study found that average time between HIV tests decreased amongst all high-risk populations between 2008 and 2015. In 2008 MSM were testing with an average of 12.5 months between tests, and PWID were testing with an average of 13.1 months between tests. By 2015, MSM cut their inter-test interval in half, with an average of 5.8 months between tests, while PWID only reduced their inter-test interval by 4 months, putting them at an average of 9 months between tests. Also, important to note for the sake of identifying resiliency is that high risk heterosexuals examined in the study began with 26.7 months between tests and ended at 15.3 months between tests. So, in terms of the surveillance data available to public health workers, most of it is coming from MSM and PWID, which leads to research and interventions that specifically target those demographics. This may be a protective factor that MTID have vs. cisgender, heterosexual people.

One potential, but very controversial, proposed protective factor was noted in a 2021 qualitative study that sought to identify factors that foster resiliency to living with HIV/AIDS.[37] Through semi-structured interviews with older MSM living with HIV, researchers identified various coping mechanisms, relationships to people and institutions, and behavioral practices that study participants believed to have contributed to their HIV/AIDS resiliency. The common factors were categorized as established protective factors, behavioral protective factors, and controversial protective factors. Noted as one of the "more polemic" factors that researchers identified, many of the MSM interviewed claimed that "their use of illicit drugs was a coping mechanism that definitely helped them get through harrowing experiences such as family rejection, job loss, isolation, depression, housing and income insecurity, stigma, discrimination, and condemnation."

Although only some participants reported using specifically IV drugs as a coping mechanism, the participants who used intravenous drugs argued that "many years of using stronger, more dangerous substances was necessary to get them through the darkest, most difficult days of their lives." Participants went on to acknowledge that there are many other healthier coping mechanisms that they could have turned to, but "insisted that at that point in their lives, using drugs was their best or only available resource to cope."

The study goes on to conclude that despite the academic controversy that was sparked by describing "managed" substance use (MSU) as a protective factor, interventions must consider and value MSU in the development and implementation of interventions that aim to cultivate resiliencies in MSM living with HIV/AIDS.[37] Although shocking at first glance, the medically sanctioned usage of IV drugs as a treatment for mental and emotional trauma is the subject of scholarly debate. In particular, intravenous use of ketamine in a clinical environment has boasted promising results as a potential treatment for depression and PTSD.[38,39]

Through the current literature it is impossible to definitively say that injection drug use (IVDU) in MSM/TGW is a protective factor for those who acquire HIV. More research must be performed to determine outcomes in MTID living with HIV and whether or not MDU could be either a protective factor, or a behavior that can be targeted for intervention development.

Another protective factor for MTID is awareness and uptake of preexposure prophylaxis (PrEP). PrEP is an antiretroviral treatment that helps prevent a person from acquiring HIV. It has been demonstrated in numerous clinical trials that PrEP is highly effective in preventing the spread of HIV.[40] The CDC recommends PrEP for MSM, TGW, and PWID. One study that examined clinician practices surrounding PrEP found that most physicians reported that the vast majority of their patients prescribed PrEP were MSM.[41] A smaller number of providers reported prescribing

PrEP to transgender individuals, but physicians still prescribed PrEP to transgender people at a higher rate than heterosexuals. Zero to one quarter of physician's patients on PrEP identified as heterosexual. Research corroborates the finding that MSM are prescribed PrEP more often than transgender individuals, but a study on HIV testing and PrEP use in sexually active transgender people in the United States found that 72% of respondents had favorable attitudes towards PrEP, suggesting that knowledge and acceptance of PrEP among TGW is generally pretty high.[42] Conversely, a weekly morbidity and mortality report released by the CDC in November of 2021 reported that only 32.3% of heterosexual adults in America knew what PrEP was, and less than 1% were using it.[43]

This raises the possibility that being MSM/TGW can act as a preventative factor in acquiring HIV through IVDU. Due to the significantly higher portions of the MSM/TGW who are aware of and/or using PrEP, it is possible that the average MTID is less likely to contract HIV by sharing needles than the average cisgender, heterosexual PWID. More research is required to determine if there is merit to this hypothesis, but based on the available research, PrEP awareness and uptake is a plausible protective factor in MTID.

3.2 Willingness to Access Testing and Treatment

According to some estimates, 70% to 90% of PWID for 10 or more years are infected with Hepatitis C (HCV).[44] Other studies estimate that anywhere from 50% to 86% of all PWID are infected with HCV. Despite these staggering numbers, one study that assessed testing prevalence from 2010 to 2017 in PWID found that only 7.7% had been tested for HCV.[45] The low prevalence of testing leads to status naivety. This study additionally found that an estimated 45% of people

with HCV do not know they are positive. Low rate of testing and high rate of infection is a plausible cause for the low rate of treatment among PWID; HCV treatment rates are reported as low as 3%.[46]

MSM and TGW are populations at high risk for HCV infection.[46,47] In stark contrast to the literature on PWID, one study of a cohort of MSM reported 41.3% of participants had been screened for HCV within the past year.[48] Martin et al found that over 40% of MSM living with HIV who experienced HCV co-infection had been treated for their HCV, suggesting that MSM are accessing testing and treatment for HCV more regularly than PWID. There is some evidence to suggest that TGW also access testing and treatment at higher rates than the overall population of PWID. A 2017 study on viral hepatitis screenings in transgender patients found that 27% of respondents had been screened for HCV.[47]

TGW also demonstrated an interesting potential protective factor. A study on TGW living in San Fransisco reported that 89% of respondents (including TGW who engaged in IVDU) had accessed trans-specific healthcare that year. One possible reason for such a high number of TGW accessing healthcare is that their access to gender affirming therapies like hormone replacement therapy or gender confirmation surgery are dependent on their attendance at appointments. Approximately 13% of transgender patients in one study were screened for HCV at their initial consultation for gender affirming therapy,[47] and TGW who were on a PrEP regiment were over 20% more likely to test negative for HCV than TGW who were not on PrEP.[49]

The body of literature on MSM/TGW and HCV is limited, and more research must be done. The literature referenced above points to many potential protective factors for MSM/TGW including a greater willingness to access testing and treatment, and points of intervention in clinical settings that MSM/TGW are already attending. Performing additional research to determine why MSM/TGW have higher testing and treatment prevalence could inform intervention development

that highlights the existing resiliencies within these populations and reinforces and cultivates these resiliencies.

Evidence suggests that MSM/TGW don't only have a relatively high prevalence of HCV testing, but also of HIV and Hepatitis B (HBV) testing.[50] In one study on acceptability of offering rapid HIV, HCV, and HBV tests at a community center in Paris, 98.5% of MSM agreed to be screened. Only 14.9% of TGW agreed to be screened, but 83% of TGW reported that they were declining screenings because they had already been tested and knew their status. In addition to testing, participants were offered the HBV vaccine on site. Only 17.9% of MSM (who were not already vaccinated) agreed to receive the first dose of the vaccine. TGW accepted the first dose at a rate of 53.3%, and PWID accepted the first dose at 66.7%. More research is necessary to determine why, in the case of vaccines, MSM/TGW were significantly less willing to engage in care. One possible explanation is that MSM/TGW access healthcare more often than PWID, so those MSM/TGW who declined the vaccine were people who held biases against vaccination, whereas this may have been the first time the PWID were offered the HBV vaccine. If that explanation has merit, the lower rates of vaccination acceptability may reinforce the argument that MSM/TGW more frequent access to care acts as a protective factor.

Another study both supports the idea that MSM are more likely to access care, and also to continue accessing care.[51] The study examined the "HIV care cascade" in MSM, PWID, and sex workers. The care cascade is a model for conceptualizing HIV care that outlines a series of HIV related services that are proven to lead to better health outcomes and a greater chance of achieving an undetectable viral load. These steps include: testing/diagnosis, linkage/enrollment, retention in care, treatment, and finally, viral suppression.[52] The study found that PWID had worse HIV care cascade outcomes than MSM. PWID were less likely to achieve viral suppression than MSM, and

PWID were found to have initiated care later after diagnosis, and were less likely to be retained in care.[51]

3.3 Limitations

This analysis on protective factors in MTID is supported only by a small body of literature. As has been established, much more research needs to be performed to confirm any of the above hypotheses. Much research on MSM/TGW does not collect data on whether the participant uses intravenous drugs or not, and much research on IVDU does not collect data on participant sexuality and gender expression. Although many studies contain cohorts of IVDU and MSM/TGW, the two populations are presented as mutually exclusive. Many of the arguments this literature review presents regarding MSM/TGW identified IVDU assume that MSM/TGW IVDU will exhibit similar behavior patterns to MSM/TGW who do not use IV drugs. It is entirely possible that this premise is false, and that these potential protective factors are actually risks. It is of the utmost importance that researchers work to determine whether these protective factors are indeed protective factors, or if MTID are experiencing greater risk and worse health outcomes than previously believed.

4.0 Interventions

4.1 Identity-Based Implications for Treatment

Understanding the unique risks faced by MTID and the potentially protective factors exhibited by MTID is essential to the development and implementation of interventions that successfully reduce rates of mortality and improve health outcomes amongst this subgroup. MTID have unique health and cultural needs that interventions must take into consideration, or they risk failure. A study on sexual identity and substance abuse treatment utilization concluded that "many sexual minority women and men who need treatment do not receive it, and even among those who get treatment, the quality of the treatment may be inadequate."[53] Many MSM/TGW individuals in treatment report experiencing discrimination, and that providers lack knowledge about how to care for MSM/TGW.

These findings are supported by multiple other studies.[54–56] According to one study on social worker and service provider preparedness to work with LGBT clients, students and alumni of a graduate level certified drug and alcohol counselor program reported that they "did not feel adequately prepared through the coursework to practice with LGBT populations affected by substance use."[56] The respondents also generally agreed that they felt significantly less prepared to counsel TGW clients than they did to counsel people who identify as MSM. The study asserts that this lack of preparedness arises from gaps in the program curriculum and a lack of necessary resources.

A small body of research confirms that this lack of preparedness leads to worse outcomes for MSM/TGW seeking treatment for addiction. Compared to cisgender, heterosexual people

accessing the same programming, LGBT people report lower levels of satisfaction, report more unfavorable attitudes of their substance abuse counselors, report many counselors exhibiting negative biases towards LGBT people. LGBT people also have lower completion rates of the same drug and alcohol treatment programs than cisgender, heterosexual people are attending.[54] On the other hand, LGBT people who attend treatment programs that are designed for LGBT people actually boast higher treatment completion rates, lower rates of people relapsing, and they report feeling more connected to their treatment programs than heterosexuals.

This clearly indicates that there is a need for specialized LGBT treatment programs to improve the outcomes of MTID. Only 20% of substance use treatment facilities in the United States offer specialized programming for LGBT users.[54] Most facilities offering these programs are private, for-profit or federally funded institutions. Facilities funded by community, local, or state governments were the least likely institutions to offer specialized LGBT treatment. This may indicate an inequity in access to these programs, and further research must be done to determine if an inequity exists and what the root causes of the inequity are.

It stands to reason that development of treatment programs for MSM/TGW audiences is an efficacious point for intervention. Some research has been done on the proper methodology for adapting traditional treatment programs for MSM/TGW. One qualitative study followed LGBT identified youth as they iterated through a substance abuse prevention curriculum and re-designed it for an audience of LGBT youth.[55] Researchers emphasized the importance of understanding the "constellation of factors that influence a youth's decision to use substances," and through semi-structured interviews with the study participants, researchers concluded that there is a high likelihood of greater success in programming such as this if the programming is culturally relevant. By allowing members of the LGBT community to re-design their own curriculum, researchers

assured that the intervention would be culturally relevant and would account for common minority stresses in the lives of LGBT people. Future use of models such as this could increase the availability of and access to specialized programming for MTID.

4.2 The Importance of Understanding Context: Chemsex as a Point of Intervention

Identity does not only present implications for treatment, but it also can determine the context in which IVDU takes place. Chemsex is defined as "the use of drugs before or during planned sexual events to facilitate, enhance, prolong and sustain the experience."[57] Research shows that chemsex is more common amongst MSM/TGW than heterosexual men and women.[58,59] This presents a unique context for designing interventions aimed at improving outcomes amongst MITD.

Research gives us an idea of what unique risk factors may be presented by MTID engaging in chemsex. One study found that MSM who engaged in chemsex were at high risk for developing an addiction to methamphetamine,[60] while other studies found potential evidence of a higher risk of sharing injecting equipment,[57] and further studies note that engaging in unprotected chemsex carries a high risk of acquiring HIV.[61] This formative research is excellent for guiding intervention development, but one study concluded that researchers need to continue drilling down into the subcultures within MTID engaging in chemsex.[62] The study identified 4 different kinds of chemsex that their participants were engaging in: "anonymous sessions", "chill-sex", "semi closed parties among networks of friends", and "chemsex in saunas or other sex on premise venues." The paper concludes by stressing that all of these 4 practices carry their own unique risk factors and protective factors and that more research must be done to better understand the contexts in which

chemsex takes place and what strategies public health workers can use to improve outcomes amongst MTID engaging in chemsex.

There are also social and material power dynamics influencing the behaviors and risk profiles associated with different types of chemsex. One 2022 study of MSM IVDU in Australia found that many MSM think of IVDU as a communal practice that is affected by sexual capital, social capital, access to substances, and competency working with substances.[63] Chemsex used to facilitate sex work is a good example of how context can shift these social and material power dynamics. A report on sexualized drug use among MSM/TGW in Asia found that for the majority of MSM/TGW, chemsex was a way to enhance sexual pleasure, prolong sexual activity, reduce inhibitions for the facilitation of sexual fantasies, and increase social status.[64] Sex workers however, reported that their primary motivations for chemsex were reducing pain experienced during anal sex, increased income from clients, and to lower inhibitions so that the sex workers can more easily have sex with people they would prefer not to. All of the factors the research has thus far identified are potential areas for intervention, and more research must be done to determine which areas are the most efficacious in improving outcomes amongst MTID.

Some promising interventions surrounding chemsex are beginning to be evaluated. Capitalizing on the established protective factor in MSM/TGW of PrEP uptake, researchers have explored whether engaging in chemsex has an effect on PrEP adherence. One quantitative study of PrEP patients at a sexual health clinic in Montreal found that chemsex did not have a detrimental effect on PrEP adherence, and that PrEP was a good way to offer a service addressing the intersection of sexual health and substance use for MTID.[65] A qualitative study on PrEP adherence in the United Kingdom found that many MSM reported recognizing their chemsex as increasing their risk for contracting HIV and as a result, beginning PrEP in order to reduce risk.[61] The study

also found no evidence of negative impact on PrEP adherence. The high PrEP uptake related to reducing risk and the lack of adherence issues indicates that PrEP based interventions may be highly effective in improving outcomes amongst MTID.

Another intervention identified MSM as avid users of technology, and sought to turn that into a protective factor.[66] Platteau et al outlines the design of an experimental app that delivers digital support and care to MSM engaging in chemsex. The application is informed by the idea of "just in time adaptive interventions" that allow users to access support and care when they need/desire it, and tailor their experience to receive as much or as little support as they need at the moment. This intervention represents not just a single promising intervention, but a look at the framework for future interventions that are more adaptable for a population that is engaging in IVDU for many different reasons in many different contexts.

4.3 A Potential Avenue for Early Intervention: Polysubstance Use in MSMTW Youth

`A large body of research supports the conclusion that MSM/TGW are more likely to be polysubstance users in their youth. One longitudinal study followed a cohort of nearly 17,000 American adolescents from ages 12-29.[67] The study examined self-reported sexual orientation and its relation to past-year polysubstance use. The results of the study showed that people who self-identified as a sexual minority were at a higher risk of polysubstance abuse across all ages. Based on age and specific sexual minority identity, participants were anywhere from 60% to 100% more likely to be polysubstance users than their heterosexual peers. These findings are corroborated by a much larger study examining data from the 2015 Youth Risk Behavior Survey.[68] That study examined data from over 119,000 adolescents from 19 states and also concluded that sexual

minority adolescents were at a higher risk of engaging in polysubstance use. This study found that across all categories of polysubstance use, sexual minority adolescents were more likely to engage than heterosexual adolescents.

Similar studies carried out examined polysubstance use in transgender youth. One study analyzed a cross-sectional sample of California school students from 2013 to 2015.[69] Results showed that transgender youth used substances at 4.8 times the rate of their cisgender peers, and that transgender youth were more likely to begin using substances at a younger age. Polysubstance use among transgender youth was found to be 4 times more common than among cisgender study participants. Additionally, the study examined lifetime prevalence of substance use and substance use in the past 30 days. Transgender youth were more likely to have both a higher lifetime prevalence and past month prevalence of substance use. These findings are supported by a 2020 analysis of the Teen Health and Technology Study.[70] Results showed that, "substance use was significantly more common for gender minority youth relative to cisgender youth in this large, national study of 13- to 18-year-olds" and went on to propose models that may be used to conceptualize where these disparities are originating.

All of these findings are of significant importance to public health workers who are attempting to prevent MSM/TGW engaging in IVDU. Research shows that early polysubstance use is a significant predictive factor in IVDU.[71] Potential interventions could use identified protective factors to proactively inform intervention design. One example of what this might look like are campaigns to educate younger MSM/TGW audiences about PrEP with materials that explicitly name PrEP as a protective factor for substance use. Other examples include health clinics that specialize in LGBT care screening for polysubstance use and providing educational on harm reduction. An additional promising example would be training physicians who prescribe gender

affirming hormone replacement therapy how to counsel adolescent transgender polysubstance users and where to refer them for gender affirming substance abuse treatment.

5.0 Conclusion

Although some formative research has been done about the intersection of MSM/TGW identity and IVDU, the body of literature that examines that specific population is woefully small. There are much larger bodies of research on MSM individuals and IVDU, which does allow for researchers to make educated guesses about how the marginalization of both communities combine to form unique risks. Additionally, resiliency research surrounding MSM/TGW and IVDU can be analyzed and synthesized in an attempt to identify what protective factors are contributing to MTID outcomes. More research needs to be done that explicitly examines the intersection of these communities. Until that research is done and researchers have a better idea of how exactly IVDU functions within the MSM and TGW populations, there are promising avenues of intervention to consider. These include creating affirming spaces for MSM/TGW identified people seeking treatment for substance use issues, targeting chemsex as a context in which IVDU is likely to occur and ensuring that interventions are designed to be flexible and scalable to an appropriate and desired level of support, and attempting to prevent MSM/TGW from ever engaging in IVDU through education and treatment programs geared towards sexual and gender minority youth.

Transgender women represented a large gap in the overall body of research. Where MSM were the focus of many studies, TGW were featured in comparatively few. Table 1 contains a breakdown of the number of studies heavily cited in each section that included MSM and TGW.

Table 1: Research Breakdown

	Research on MSM	Research on TGW
Risks	9	4
Potential Protective Factors	6	3
Implications for Intervention	17	9
Total	32	16

As is demonstrated in Table 1, there are 2 MSM studies for every TGW study. This is a significant gap in research that must be addressed because the research indicates that TGW are at higher risk of becoming IVDU than MSM, and that they are at a higher risk of detrimental outcomes (e.g.: HIV infection) if they begin to use IV drugs than MSM. This research gap is complicated by the erasure of intersectional identities observed in much of the literature reviewed. Many articles discussed MSM, TGW, sex workers, and PWID as though they were all neatly stratified groups. Conclusions were drawn about MSM compared to PWID without accounting for the possibility that someone can be both. One study compared MSM, PWID, and sex workers without ever recognizing that a participant could have been all 3. This erasure of intersecting identities could have been alleviated by researchers explicitly noting how they handled cases of intersecting identities, or being explicit if they did not recruit people of intersecting identities, but

not one study examined in this literature review indicated that they took intersecting identities in their participants into account.

If these gaps in research are addressed, efforts to support an extremely vulnerable population would be more data driven, more targeted, and more successful at improving health outcomes. The models created to understand the intersection of these high-risk populations could potentially inform future research on the intersection of other forms of marginalization and IVDU, or inform future research on what protective factors interventions should target to cultivate in TGW.

Bibliography

1. Hafeez H, Zeshan M, Tahir MA, Jahan N, Naveed S. Health Care Disparities Among Lesbian , Gay , Bisexual , and Transgender Youth : A Literature Review Depression and suicidal risk among discriminated LGBT youth. 2017;9(4). doi:10.7759/cureus.1184

2. Gates GJ. Demographics and LGBT Health. Published online 2013. doi:10.1177/0022146512474429

3. Degenhardt L, Peacock A, Colledge S, et al. Global prevalence of injecting drug use and sociodemographic characteristics and prevalence of HIV , HBV , and HCV in people who inject drugs : a multistage systematic review. *Lancet Glob Heal*. 2017;5(12):e1192-e1207. doi:10.1016/S2214-109X(17)30375-3

4. Larney S, Peacock A, Mathers BM, Hickman M, Degenhardt L. A systematic review of injecting-related injury and disease among people who inject drugs. *Drug Alcohol Depend*. 2017;171:39-49. doi:10.1016/j.drugalcdep.2016.11.029

5. Alvidrez J, Greenwood GL, Johnson TL, Parker KL. Intersectionality in Public Health Research : A View From the National Institutes of Health. :95-97.

6. Cochran SD, Ackerman D, Mays VM, Ross MW. Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. Published online 2004:989-999.

7. McCabe SE, Hughes TL, Bostwick WB, West BT, Boyd CJ. Sexual orientation, substance use behaviors and substance dependence in the United States. *Addiction*. 2009;104(8):1333-1345. doi:10.1111/j.1360-0443.2009.02596.x

8. Hughes TL, Eliason M. Substance Use and Abuse in Lesbian , Gay , Bisexual and Transgender Populations. 2002;22(3):263-298.

9. Raymond HF, Ick TO, Chen YH. A Comparison of Men Who Have Sex with Men, People Who Inject Drugs and High-Risk Heterosexuals' Risk for HIV Infection, San Francisco. *AIDS Behav*. 2016;20(2):417-422. doi:10.1007/s10461-015-1181-0

10. Baral SD, Poteat T, Strömdahl S, Wirtz AL, Guadamuz TE, Beyrer C. Worldwide burden of HIV in transgender women : a systematic review and meta-analysis. *Lancet Infect Dis*. 2022;13(3):214-222. doi:10.1016/S1473-3099(12)70315-8

11. Truong HHM, O'Keefe KJ, Pipkin S, et al. How are transgender women acquiring HIV? Insights from phylogenetic transmission clusters in San Francisco. *Aids*. 2019;33(13):2073-2079. doi:10.1097/QAD.0000000000002318

12. Wilson EC, Chen Y, Raad N, Raymond HF, Dowling T, Mcfarland W. Who are the sexual partners of transgender individuals ? Differences in demographic characteristics and risk behaviours of San Francisco HIV testing clients with transgender sexual partners compared with overall testers. Published online 2014:319-323.

13. Davis JM, Suleta K, Corsi KF, Booth RE. A Hazard Analysis of Risk Factors of Mortality in Individuals Who Inject Drugs in Denver CO. *AIDS Behav*. 2017;21(4):1044-1053. doi:10.1007/s10461-016-1660-y

14. O'Driscoll PT, McGough J, Hagan H, Thiede H, Critchlow C, Alexander ER. Predictors of accidental fatal drug overdose among a cohort of injection drug users. *Am J Public Health*. 2001;91(6):984-987. doi:10.2105/AJPH.91.6.984

15. Seal KH, Kral AH, Gee L, et al. Predictors and Prevention of Nonfatal Overdose Among Street-Recruited Injection Heroin Users in the San Francisco Bay Area , 1998 – 1999. 2001;91(11):1998-1999.

16. Centers for Disease Control and Prevention. Opioid Data Analysis and Resources. Published 2021. https://www.cdc.gov/opioids/data/analysis-resources.html

17. Prevention V, Control D. NISVS : An Overview of 2010 Findings on Victimization by Sexual Orientation. Published online 2010:0-1.

18. Flores AR, Langton L, Meyer IH, Romero AP. Victimization rates and traits of sexual and gender minorities in the United States : Results from the National Crime Victimization Survey , 2017. 2020;(October).

19. Marshall BDL, Fairbairn N, Li K, Wood E, Kerr T. Physical violence among a prospective cohort of injection drug users : A gender-focused approach. 2022;97(2008):237-246. doi:10.1016/j.drugalcdep.2008.03.028

20. Braitstein P, Li K, Tyndall M, et al. Sexual violence among a cohort of injection drug users. 2003;57:561-569.

21. Miller CL, Kerr T, Strathdee SA, Li K, Wood E. Factors associated with premature mortality among young injection drug users in Vancouver. 2007;7:1-7. doi:10.1186/1477-7517-4-1

22. Emlet CA, Study G. Social, Economic, and Health Disparities Among LGBT Older Adults. 2017;40(2):16-22.

23. Prentice JC, Pizer SD. Delayed Access to Health Care and Mortality. Published online 2006:644-662. doi:10.1111/j.1475-6773.2006.00626.x

24. Flentje A, Livingston NA, Sorensen JL. Meeting the Needs of Lesbian, Gay, and Bisexual Clients in Substance Abuse Treatment. 2017;17(3):54-59.

25. Miller-Lloyd L, Landry J, Macmadu A, Allard I, Waxman M. Barriers to Healthcare for People Who Inject Drugs: A Survey at a Syringe Exchange Program. *Subst Use Misuse*. 2020;55(6):896-899. doi:10.1080/10826084.2019.1710207

26. Kates J, Ranji U, Beamesderfer A, Salganicoff A, Dawson L. Health and Access to Care and Coverage for Lesbian , Gay , Bisexual , and Transgender Individuals in the U . S . 2018;(May).

27. Khan A, Plummer D, Hussain R, Minichiello V. Does physician bias affect the quality of care they deliver? Evidence in the care of sexually transmitted infections. *Sex Transm Infect*. 2008;84(2):150-151. doi:10.1136/sti.2007.028050

28. Mendiola CK, Galetto G, Fingerhood M. An Exploration of Emergency Physicians ' Attitudes Toward Patients With Substance Use Disorder. 2018;12(2). doi:10.1097/ADM.0000000000000377

29. Kennedy-hendricks A, Busch SH, Mcginty EE, et al. Primary care physicians ' perspectives on the prescription opioid epidemic. *Drug Alcohol Depend*. 2022;165(2016):61-70. doi:10.1016/j.drugalcdep.2016.05.010

30. Buchmueller T, Carpenter CS. Disparities in Health Insurance Coverage , Access , and Outcomes for Individuals in Same-Sex Versus. 2010;100(3):489-495. doi:10.2105/AJPH.2009.160804

31. Cawley J, Simon KI, Cawley J, Hall MVR. THE IMPACT OF THE MACROECONOMY ON HEALTH INSURANCE COVERAGE : Published online 2011.

32. Wand H, Guy R, Law M, Wilson DP, Maher L. High rates of late HIV diagnosis among people who inject drugs compared to men who have sex with men and heterosexual men and women in Australia. *AIDS Behav*. 2013;17(1):235-241. doi:10.1007/s10461-011-0117-6

33. Coffey S, Bacchetti P, Sachdev D, et al. RAPID antiretroviral therapy : high virologic suppression rates with immediate antiretroviral therapy initiation in a vulnerable urban clinic population. 2019;(December 2018). doi:10.1097/QAD.0000000000002124

34. Lifson AR, Grund B, Gardner EM, et al. Improved quality of life with immediate versus deferred initiation of antiretroviral therapy in early asymptomatic HIV infection. 2017;(December 2016). doi:10.1097/QAD.0000000000001417

35. Connor JO, Vjecha MJ, Phillips AN, et al. Effect of immediate initiation of antiretroviral therapy on risk of severe bacterial infections in HIV-positive people with CD4 cell counts of more than 500 cells per μL : secondary outcome results from a randomised controlled trial. *Lancet HIV*. 2022;4(3):e105-e112. doi:10.1016/S2352-3018(16)30216-8

36. An Q, Song R, Finlayson TJ, Wejnert C, Paz-Bailey G. Estimated HIV Inter-test Interval

Among People at High Risk for HIV Infection in the U.S. *Am J Prev Med*. 2017;53(3):355-362. doi:10.1016/j.amepre.2017.02.009

37. Liboro RM, Yates TC, Bell S, et al. Protective factors that foster resilience to hiv/aids: Insights and lived experiences of older gay, bisexual, and other men who have sex with men. *Int J Environ Res Public Health*. 2021;18(16). doi:10.3390/ijerph18168548

38. Brien BO, Lijffijt M, Lee J, et al. Distinct trajectories of antidepressant response to intravenous ketamine ☆. *J Affect Disord*. 2021;286(January):320-329. doi:10.1016/j.jad.2021.03.006

39. Feder A, Parides MK, Murrough JW, et al. Efficacy of Intravenous Ketamine for Treatment of Chronic Posttraumatic Stress Disorder A Randomized Clinical Trial. 2022;10029(6):681-688. doi:10.1001/jamapsychiatry.2014.62

40. Centers for Disease Control and Prevention. *Preexposure Prophylaxis for the Prevention of HIV Infection in the United States - 2021 Update*.; 2021.

41. Adams LM, Balderson BH, Brown K, Bush SE, Packett BJ. Who Starts the Conversation and Who Receives Preexposure Prophylaxis (PrEP)? A Brief Online Survey of Medical Providers' PrEP Practices. *Heal Educ Behav*. 2018;45(5):723-729. doi:10.1177/1090198117752789

42. Sevelius JM, Poteat T, Luhur WE, Reisner SL, Meyer IH. HIV Testing and PrEP Use in a National Probability Sample of Sexually Active Transgender People in the United States. 2020;84(5):437-442.

43. Baugher AR, Trujillo L, Kanny D, et al. Racial , Ethnic , and Gender Disparities in Awareness of Preexposure Prophylaxis Among HIV-Negative Heterosexually Active Adults at Increased Risk for HIV Infection — 23 Urban Areas , United States , 2019. 2021;70(47):1635-1639.

44. Edlin BR, Carden MR, Ferrando SJ. Managing Hepatitis C in Users of Illicit Drugs. 2013;6(2):60-67.

45. Bull-otterson L, Huang YA, Zhu W, King H, Edlin BR, Hoover KW. Human Immunodeficiency Virus and Hepatitis C Virus Infection Testing Among Commercially Insured Persons Who Inject Drugs , United States , 2010 – 2017. 2020;222:2010-2017. doi:10.1093/infdis/jiaa017

46. Martin NK, Vickerman P, Dore GJ, Hickman M. The hepatitis C virus epidemics in key populations (including people who inject drugs, prisoners and MSM): The use of direct-acting antivirals as treatment for prevention. *Curr Opin HIV AIDS*. 2015;10(5):374-380. doi:10.1097/COH.0000000000000179

47. Mangla N, Mamun R, Weisberg IS. Viral hepatitis screening in transgender patients

undergoing gender identity hormonal therapy. Published online 2017:1215-1218. doi:10.1097/MEG.0000000000000950

48. Vaux S, Chevaliez S, Saboni L, et al. Prevalence of hepatitis C infection , screening and associated factors among men who have sex with men attending gay venues : a cross-sectional survey. Published online 2019:1-14.

49. Id CJH, Trujillo D, Sicro S, et al. High hepatitis C virus seropositivity , viremia , and associated risk factors among trans women living in San Francisco , California. Published online 2021:1-11. doi:10.1371/journal.pone.0249219

50. Calin R, Massari V, Pialoux G, et al. Acceptability of on-site rapid HIV/HBV/HCV testing and HBV vaccination among three at-risk populations in distinct community-healthcare outreach centres: the ANRS-SHS 154 CUBE study. *BMC Infect Dis*. 2020;20(1):1-14. doi:10.1186/s12879-020-05601-7

51. Risher K, Mayer KH, Beyrer C. HIV treatment cascade in MSM, people who inject drugs, and sex workers. *Curr Opin HIV AIDS*. 2015;10(6):420-429. doi:10.1097/COH.0000000000000200

52. Maccarthy S, Hoffmann M, Ferguson L, et al. The HIV care cascade : models , measures and moving forward. Published online 2015:2-6. doi:10.7448/IAS.18.1.19395

53. Mccabe SE, Ph D, West BT, et al. Sexual orientation and substance abuse treatment utilization in the United States : Results from a national survey. *J Subst Abuse Treat*. 2022;44(1):4-12. doi:10.1016/j.jsat.2012.01.007

54. Qeadan F, Akofua Mensah N, Gu LY, et al. Factors associated with the availability of tailored programs for LGBT clients in substance use disorder treatment facilities in the U.S. from 2008 to 2018. *J Gay Lesbian Soc Serv*. 2021;0(0):1-22. doi:10.1080/10538720.2021.1954125

55. Goldbach JT, Steiker LKH. An examination of cultural adaptations performed by LGBT-identified youths to a culturally grounded, evidence-based substance abuse intervention. *J Gay Lesbian Soc Serv*. 2011;23(2):188-203. doi:10.1080/10538720.2011.560135

56. Dentato MP, Kelly BL, Lloyd MR, Busch N. Preparing social workers for practice with LGBT populations affected by substance use: perceptions from students, alumni, and service providers. *Soc Work Educ*. 2018;37(3):294-314. doi:10.1080/02615479.2017.1406467

57. Maxwell S, Shahmanesh M, Gafos M. Chemsex behaviours among men who have sex with men : A systematic review of the literature. *Int J Drug Policy*. 2022;63(2019):74-89. doi:10.1016/j.drugpo.2018.11.014

58. Heinsbroek E, Glass R, Edmundson C, Hope V, Desai M. Patterns of injecting and non-

injecting drug use by sexual behaviour in people who inject drugs attending services in England, Wales and Northern Ireland, 2013–2016. *Int J Drug Policy*. 2018;55(September 2017):215-221. doi:10.1016/j.drugpo.2018.02.017

59. Jalil EM, Torres TS, Pereira CCDA, et al. High Rates of Sexualized Drug Use or Chemsex among Brazilian Transgender Women and Young Sexual and Gender Minorities. Published online 2022:1-11.

60. Li C, Ku SW, Huang P, et al. Factors associated with methamphetamine dependency among men who have sex with men engaging in chemsex : Findings from the COMeT study in Taiwan. *Int J Drug Policy*. 2022;93(2021):103119. doi:10.1016/j.drugpo.2021.103119

61. Maxwell S, Shahmanesh M, Gafos M. Pre-exposure prophylaxis (PrEP) uptake and adherence experiences of gay and bisexual men who engage in chemsex : A qualitative study. *Int J Drug Policy*. 2022;103:103630. doi:10.1016/j.drugpo.2022.103630

62. Santoro P, Rodríguez R, Morales P, Morano A, Morán M. International Journal of Drug Policy One " chemsex " or many ? Types of chemsex sessions among gay and other men who have sex with men in Madrid , Spain : fi ndings from a qualitative study. *Int J Drug Policy*. 2022;82(2020):102790. doi:10.1016/j.drugpo.2020.102790

63. Schroeder SE, Bourne A, Doyle J, Stoove M, Hellard M, Pedrana A. "It's not just the hit itself": the social practice of injecting drug use among gay and bisexual men in Australia. *Int J Drug Policy*. 2022;103:103642. doi:10.1016/j.drugpo.2022.103642

64. Newland J, Kelly-Hanku A. *A Qualitative Scoping Review of Sexualised Drug Use (Including Chemsex)*.; 2021.

65. Luis J, Anato F, Panagiotoglou D, et al. Chemsex practices and pre-exposure prophylaxis (PrEP) trajectories among individuals consulting for PrEP at a large sexual health clinic in Montr ´. 2021;226(February):1-8. doi:10.1016/j.drugalcdep.2021.108875

66. Platteau T, Herrijgers C, Wit J De. Digital chemsex support and care : The potential of just-in-time adaptive interventions. *Int J Drug Policy*. 2022;85(September 2020):102927. doi:10.1016/j.drugpo.2020.102927

67. Kecojevic A, Jun HJ, Reisner SL, Corliss HL. Concurrent polysubstance use in a longitudinal study of US youth: associations with sexual orientation. *Addiction*. 2017;112(4):614-624. doi:10.1111/add.13681

68. Coulter RWS, Ware D, Fish JN, Plankey MW. Latent Classes of Polysubstance Use Among Adolescents in the United States: Intersections of Sexual Identity with Sex, Age, and Race/Ethnicity. *LGBT Heal*. 2019;6(3):116-125. doi:10.1089/lgbt.2018.0149

69. Day JK, Ph D, Fish JN, et al. Transgender Youth Substance Use Disparities : Results

From a Population Based Sample. *J Adolesc Heal*. 2022;61(6):729-735. doi:10.1016/j.jadohealth.2017.06.024

70. Reisner SL, Greytak EA, Parsons JT, Ybarra ML. Gender Minority Social Stress in Adolescence : Disparities in Adolescent Bullying and Substance Use by Gender Identity. 2020;52(3):243-256. doi:10.1080/00224499.2014.886321

71. Trenz RC, Scherer M, Harrell P, Zur J, Sinha A, Latimer W. Early onset of drug and polysubstance use as predictors of injection drug use among adult drug users. *Addict Behav*. 2012;37(4):367-372. doi:10.1016/j.addbeh.2011.11.011