

## **Slamsex in The Netherlands among men who have sex with men (MSM):**

### **Use patterns, motives, and adverse effects**

Leon Knoops<sup>1</sup>, Jan van Amsterdam<sup>2</sup>, Thijs Albers<sup>3</sup>, Tibor Markus Brunt<sup>2</sup>,

Wim van den Brink<sup>1,2</sup>

<sup>1</sup> Mainline, P.O. Box 58303, 1040 HH Amsterdam

<sup>2</sup> Amsterdam UMC, location University of Amsterdam, Department of Psychiatry, Meibergdreef 9, Amsterdam, Netherlands; Amsterdam Neuroscience, Research Program Compulsivity, Impulsivity & Attention, Amsterdam, The Netherlands.

P.O. Box 22660, 1100 DD Amsterdam, The Netherlands

<sup>3</sup> Interdisciplinary Social Science, Social policy and public health, University of Utrecht, Heidelberglaan 8, 3584 CS Utrecht, The Netherlands

Correspondence:

Leon Knoops, Mainline, Postbus 58303, 1040 HH Amsterdam. [l.knoops@mainline.nl](mailto:l.knoops@mainline.nl)

### **Summary text for the Table of Contents.**

About 0.5-3.1% of men who have sex with men (MSM) self-inject drugs before or during sex ('slamming').

Our survey among 175 Dutch MSM, who had practised slamsex, reported various adverse health effects associated with slamsex (skin problems, collapsed veins, infections, and psychological symptoms, like insomnia, sadness, depressed mood, anxiety, suicidal tendencies and loss of control).

The current information of slamsex by MSM may contribute to the reinforcement of accessible, non-judgmental and well-informed prevention and harm reduction activities.

### **Abstract**

**Background:** This paper describes the results of an online survey of men who have sex with men (MSM) and use drugs before or during sex ('chemsex') via injection ('slamming' or 'practicing slamsex'). Depending on the definition of chemsex and the population studied, 15-30% of the MSM population in the Netherlands seems to have practiced chemsex at some point, and 0.5-3.1% of them ever had 'slamsex'. This study investigates which substances are used in the Netherlands during slamsex, the motives for slamming and the health risks involved in slamsex.

**Method:** In this cross-sectional study, 175 MSM from the Netherlands, who had used substances before or during sex via injection, were surveyed via an ad-hoc online questionnaire specially designed for this study.

**Results:** The mean age of the respondents was 47.8 years (range: 19-78 years). During chemsex, almost any conceivable substance was used, while the most common substances that were injected (slammed) were 3-methylmethcathinone (3-MMC), methamphetamine, ketamine, 4-methylethcathinone (4-MEC) and mephedrone (4-MMC). Reasons for slamming were mainly the experience of a more intense rush and longer sex. Virtually none of the respondents used a condom during slamsex, but needles were almost never shared and usually used only once. Slammers reported many health problems associated with injecting drugs (skin problems, collapsed veins and infections). Perhaps more worryingly were the psychological symptoms reported by about three-quarters of respondents, including insomnia, sadness, depressed mood, anxiety and suicidal tendencies. About half of the respondents reported some degree of loss of control or concerns about their slamming behaviour.

**Conclusion:** This study shows that slamsex among MSM in the Netherlands is associated with consciously chosen sexual risk behaviours, but also with conscious risk-avoidance slam behaviours. Slamsex seems to be associated with many physical and psychological problems. This detailed description of slamsex among MSM may contribute to the reinforcement of accessible, non-judgmental and well-informed prevention and harm reduction activities and to the support MSM practicing slamsex.

**Key words:** slamsex, chemsex, methamphetamine, cathinones, slamming, MSM

## **Introduction**

Sexualized substance use or 'chemsex' - the use of illegal substances during sex to increase pleasure and facilitating sexual sessions that last several hours or days<sup>1</sup> - has become more common in the past decade among gay, bisexual and other men who have sex with men (MSM). 'Slamsex', a subcategory of chemsex, involves injecting ('slamming' or 'practicing slamsex') drugs before or during sexual encounters.<sup>2,3</sup> By now, chemsex is a widespread practice across MSM in high income countries world-wide.<sup>4-10</sup> Among the most commonly used chemsex drugs are mephedrone, crystal methamphetamine (meth), and GHB/GBL,<sup>11-13</sup> which are taken orally or anally ('booty bumping'). Unlike the current study, most studies from the UK and the US, include the use of poppers, cannabis, alcohol, and nitrous oxide during sex in their definition of chemsex.

So far, research has mainly been focussed on chemsex. Slamsex, practiced by a (small) subgroup of people practicing chemsex, has been much less studied. Existing studies were recently reviewed by Scheinbein et al.<sup>14</sup> who in their review explained the reasons to practice slamsex and described the implications for health care and policy of MSM and sexualized injecting drug use ("SIDU"), including being on antiretroviral treatment. The authors further addressed challenging social taboos, ill-equipped traditional services to address "SIDU", such as lack of knowledge of practices and lack of associated vocabulary and a failure to integrate sexual health with drug services. For instance, among 1,589 MSM attending HIV services in four European countries, 24.0% and 6.5% reported chemsex and slamsex in the last year, respectively.<sup>15</sup> A survey among clients of 30 HIV clinics in England and Wales showed that 29% of MSM

reported engaging in chemsex in the past year and about ten percent reported slamming.<sup>16</sup> Prevalence rates of both chemsex and slamming highly depend on the definition of chemsex and sample selection. As such, a recent overview of the prevalence of slamming world-wide reported extremely variable slam prevalence rates among MSM, ranging from 2 to 91%, whereas the rates ranged from 7 to 14% in other sexually active subjects.<sup>17</sup> Methamphetamine, mephedrone and other synthetic cathinones appeared to be the most popular slamsex drugs; more rarely ketamine, MDMA, speed and cocaine.<sup>15, 18-22</sup>

In the Netherlands, slamsex is an under-studied and under-reported phenomenon. Since 2017, Dutch prevention and harm reduction professionals noticed an increase in slamsex among MSM, but also among male sex workers, transsexual people and bisexual men and women. On dating apps and websites, communication about slamsex is becoming more frequent and (usually) open, and from 2016 the chemsex team of the Mainline foundation, a Dutch non-profit organization dedicated to harm reduction related to drug use, received more and more acute requests for help regarding problems related to slamsex. This mainly concerned users of methamphetamine and/or 3-MMC who were looking for low-threshold support or professional help. Recent studies showed that the prevalence of slamming among MSM who practice chemsex in The Netherlands was (still) low: 0.5% to 3.1%.<sup>23, 24</sup> However, very little is known about the motives, the practice, and the adverse effects of slamsex. The aim of this study is, therefore, to have a better description of the motives for slamsex, the nature of the slamming behaviour, and the problems and needs of a group of Dutch MSM who regularly practice slamsex.

## **Methods**

### **Survey**

A cross-sectional, quantitative study about slamming among 175 MSM who used drugs intravenously before or during sexual activities was performed using an online survey consisting of 60 questions, divided over five thematic blocks: Personal data, Drugs used, Sexual experiences, Complaints and Information and assistance. Since no standard (validated) questionnaire was available we developed a new “ad-hoc” self-report questionnaire based on professional knowledge and discussions with persons with lived slamsex experiences. From March to July 2020, the survey was entered into SurveyMonkey, tested, and modified several times. From July 2020 to January 2021, this ad hoc questionnaire could be completed by gay and bisexual men and by trans and non-binary persons aged eighteen and older who had had sex with men and had at least three experiences with slamsex. Completing the questionnaire took about 20-30 minutes.

### **Definitions**

In the current study, the following definition is used for slamming: 'the use of (a combination of) substances - except for poppers, cannabis, alcohol and nitrous oxide - during sex by men who have sex with men'. Of course, participants practicing chemsex could have used all kinds of drugs (also outside the context of chemsex) and, therefore, in the questionnaire all drugs were recorded. In this report, slamming

stands for 'injecting drugs intravenously (into the veins), intramuscularly (into the muscles: 'muscling') or subcutaneously (under the skin: 'skin popping') during sex. Note that alcohol, poppers, nitrous oxide or cannabis are not injected and thus not considered in our description of slamsex. In most cases, this involved intravenous injection. Ketamine was sometimes injected intramuscularly or subcutaneously.

### **Recruitment of participants**

The survey link was shared via Mainline's website and newsletter, on social media and the website [sexntina.nl](http://sexntina.nl). In addition, respondents were personally recruited through professionals affiliated with the Amsterdam Chemsex Consultation, Mainline's national network of healthcare professionals from (mental) health and addiction care, and the National Network of HIV Consultants. Additional efforts were made to recruit sub-target groups such as sex workers, trans people and migrants who fled their home country because of their LGBTI status. The largest group of respondents was reached through 'Planet Romeo', a popular European gay dating site. Ultimately, 175 participants living in The Netherlands took part in the study; 153 questionnaires were completed in full, implying a dropout rate of only 13%; the remaining 22 questionnaires were approximately half completed but were included in the analysis of the survey. The survey could be completed either in Dutch or English by those not speaking Dutch; 17 questionnaires were completed in English and 158 in Dutch. According to Dutch law, ethical approval of the study was not required since the survey was filled out fully anonymously and participants gave informed consent to use the information for research purposes when asked during filling the questionnaire.

### **Statistics**

Presented data are descriptive data which were not statistically evaluated.

## **Results**

### **Demographics of the sample**

The mean age of the respondents was 47.8 years (range: 19-78 years). The largest group was between 51 and 60 years (32%), followed by the group between 41 and 50 years (29%), the group over sixty (15%, with 4 men older than 71 years), the group of younger than 30 years (14%), and finally the group between 31 and 40 years (10%). All 175 respondents in the survey identified themselves as 'male'. Despite the many attempts to reach trans and non-binary people through the trans community and outreach, none of the respondents identified themselves as such. 152 respondents identified themselves as gay (87%), 21 as bisexual (12%) and 2 as queer (1%). Most respondents had a Dutch cultural background (78%), 11% had a non-Dutch European background and 9% had a non-European background. Almost half of the respondents lived in a large city (48%) and almost a fifth in a medium-sized city (19%). The other respondents lived in a small town (14%), a village (16%) or in rural areas (3%).

### **Use of chemsex and slamsex drugs and their combinations**

All substances, that the respondents ever used during sex, including alcohol, poppers, cannabis and nitrous oxide, are summarized in Table 1. Note that the substances mentioned in table 1 are not exclusively used in slamsex. The most frequently used substances used at least weekly during sex were poppers (58%), 3-MMC (50%), GBL (28%) and GHB (25%), alcohol (15%), methamphetamine (13%), ketamine (12%) and cannabis (11%).

The most frequently used slamdrugs were 3-MMC (81.5%), methamphetamine (79.8%) and ketamine (36.4%) (cf. Table 2). More than a third of the respondents (37.8%) had experience with slamming multiple substances at the same time, while 15% of respondents had an explicit preference for slamming multiple substances at the same time, especially the combination of methamphetamine or 3-MMC together with ketamine and/or MDMA. The most favourite slamsex drug(s) were methamphetamine (46%), 3-MMC (43%) and – to a lesser extend - ketamine (5%) (data not shown). Some respondents explicitly preferred the combination of a cathinone with ketamine. In the group where methamphetamine was the drug of choice, 3-MMC was often mentioned as the second most favourite. In addition, respondents were asked which other substances were used during slamsex but administered non-intravenously. Table 3 shows that GHB or GBL were most frequently mentioned, followed by poppers, ketamine, 3-MMC and methamphetamine.

Finally, 11 of the 173 respondents (6%) had ever used anabolic steroids, of which two respondents took oral steroids, seven injectable steroids, and two both oral and injectable steroids. Some respondents have since stopped using steroids.

### **Slamsex history**

Of all respondents, 41% had been slamming for more than 3 years, 38% for 1 to 3 years and 21% for less than 1 year. In total, 26% had ever tried to quit slamsex, of which 85% had made two or more quit attempts and three respondents more than ten attempts. One in five respondents (19.5%) said they never allowed to be slammed by others (and always injected the slamsex drugs themselves), while the other respondents did allow this to varying degrees. Of all respondents, 46 (26%) had not slammed in the month before the survey, of which 21 (12%) had stopped slamsex altogether. About three-quarter of respondents (74%) had slammed in the past four weeks; 36% of them once, 35% 2-3 times, 25% weekly or every weekend and 5% (almost) daily.

During the COVID-19 pandemic, 12 respondents (7%) took a slamsex break, while 29 respondents (17%) had slammed more often. The largest group said they had slamsex 'equally' (35%) or somewhat less often (29%). Of the 172 respondents who answered the COVID questions, 12% said they had stopped slamsex completely. Incidentally, less than half (45%) had also sex without substance use in the past month and one in ten had used drugs at each sexual encounter for more than six years.

### **Motives for slamsex**

The most frequently mentioned reasons (added value) of slamsex compared to other forms of drug

administration were a more intense rush (86%), and longer sex (66%), more sexual energy (50%), no/less inhibitions (48%), increased sexual focus (43%) and more extreme sex (35%). Other reasons that were mentioned (< 25%) were 'huge confidence boost', longer and more intense orgasms, boosted ego, enjoyment of pain/humiliation and 'overcoming fear of sexually transmitted infections (STIs)'.

### **Slamsex technique**

Most respondents bought their needles and syringes online (64%), at the pharmacy (30%) or received them from their sex partner (30%). The vast majority of respondents (89%) never shared their needles, almost two-thirds (65%) used the needles only once and only a few (5%) shared blood while slamming ('brotherhood'). Most slam sessions lasted 6-12 hours (40%), 23% lasted less than 6 hours, 19% lasted 12-24 hours, 13% lasted 1-2 days and 2% lasted longer than 3 days. 35.2% of respondents reported that they had slammed multiple times in a row during slamsex.

### **Setting**

Almost three quarters of the respondents reported that their first slam experience took place at other people's homes and more than a quarter at their own home. Respondents reported on average 2.6 sources for arranging a slamsex date (cf. Table 4) with most of them organized through sex friends, dating apps and – to a lesser extent - slamsex parties. Slamsex dates were much less frequently found in a pub, sauna, darkroom or during a circuit party (cf. Table 4). Most slamsex sessions took place 'at other people's homes' (80%), 'at home with others' (75%) or in public spaces, such as cruise spots (15%), darkrooms (11%), saunas (10%) and sex swingers clubs (10%). Of all respondents, 61% reported that their sex network consisted of a maximum of ten slammers, 21% had a slamsex-network of 11 to 25 people, 10% had a slam-network of 25-250 people, and in one case the slamsex-network comprised more than 250 people. Nearly two-thirds of the respondents (63%) never used condoms during sex; 18% sometimes. During slamsex, 83% never used condoms and 7% sometimes, while none of the respondents always used condoms. For many of those who rarely or never used condoms, anal sex without condom was a conscious choice and a matter of principle, separate from slamsex or substance use during sex.

### **Adverse health complaints**

Almost half (49%) of the respondents was HIV positive and 45% was HIV negative; the remaining 6% of the participants were unaware of their current HIV status or had never been tested. Almost all (98%) of the HIV-positives used HIV medication and 66% of the HIV-negatives used Pre-Exposition Prophylaxis (PrEP; 55% daily and 47% before a sex date). Almost all respondents (94%) were regularly tested for STIs, more than half (59%) every three months and more than a quarter every six months (26%). Most respondents had had at least one STI in the past two years (94%), with chlamydia being the most reported (60%), followed by gonorrhoea (55%) and syphilis (48%). A total of 332 STIs were reported, an average of two per respondent. More than a quarter of the respondents has ever had hepatitis C (26%).

More than half of this group contracted the hepatitis C virus again.

Of the respondents, 92% had ever (at least once) suffered from slamsex-related complaints, with less drastic complaints such as bruising (81%) and extravasation (61%). More than one in three also sometimes suffered from more serious slam-related complaints such as skin problems (35%), collapsed veins (32%) and infections (32%). One in six (17%) had experienced an overdose.

In addition to these slamsex-related complaints, more than three quarters of the respondents (77%) had physical complaints from slamming drugs ranging from relatively harmless, such as teeth grinding (58%) and muscle twitching (27%), to severe such as cardiovascular problems (6%) and kidney problems (2%). Three quarters of the respondents (76%) had experienced life-time psychological problems as a result of practising slamsex. Table 5 shows that insomnia was the most common mental health complaint, followed by sadness and/or depressive feelings. Eight respondents reported ever suicidal tendencies due to slamming, four of which actually made one or more suicide attempts. In addition, 47% of the respondents endorsed at least one out of five given statements about loss of control or concerns about slamsex, with 27% being concerned about their own slamsex behaviour, 21% having feelings of regret after slamming and 5% reporting loss of control over slamming.

Almost one in five respondents ever sought (professional) help, specifically because of slamming or related complaints (19.5%). This involved help through multiple care disciplines, often seeking help aimed at addiction and (sexual) health as well as social and psychological support.

## **Discussion**

This study provides a detailed description of slamsex in the Dutch MSM population. It shows that the main aims of slamsex are to have a more intense rush and longer sex, confirming previous results.<sup>1</sup> About three-quarters of all respondents (74%) had practiced slamsex in the past four weeks; 71% of them 1-3 times, 25% weekly or every weekend and 5% (almost) daily. This rate compares well with data from Australia, where 43% of gay and bisexual practicing slamsex slammed at least once a month and 17% at least weekly.<sup>22</sup>

As shown before,<sup>15, 18-20</sup> the most popular slamming drugs are 3-MMC, methamphetamine and - to a lesser extent - ketamine. Especially, the use of methamphetamine is of concern as this substance can cause serious physical and psychological harm,<sup>25</sup> including psychological dependence. In addition, acute intoxications following the use of slam drugs (e.g., 3-MMC, GHB and 4-MEC) have been reported, of which 6 out of 13 cases had a fatal outcome.<sup>26</sup> In the current study, 17% of the responders reported one or more overdoses due to slamsex drugs.

This study also shows that virtually none of the MSM used a condom during slamsex and that this seems to lead to many STIs. However, the study also found that needles were almost never shared during slamming, that needles were usually used only once and that only a few respondents shared needles during slamming ('brotherhood'). Thus, a mix of conscious sexual risk behaviours and conscious risk-avoidance behaviours, suggesting that many are still in control of the own slamsex behaviour. Nevertheless, many

respondents had problems associated with injecting drugs (skin problems, collapsed veins, infections) and three quarters reported experiencing psychological problems, such as insomnia, sadness, depressed feelings, anxiety, and suicidal tendencies. Finally, about half of the respondents said they recognized some form of loss of control or were concerned about their slamming behaviour. In addition to this, about forty percent reported multiple slamming sessions in a row during slamsex. Characteristic of the latter is that 26% had ever tried to stop slamming, of which 85% have made two or more attempts to stop and three respondents more than ten times. These findings, albeit more detailed, generally agree well with previous research on slamsex in the Netherlands<sup>27-31</sup> and beyond.<sup>32</sup> A previous study, showed for instance that 41% of those engaged in chemsex (n=382) reported unwanted side effects due to chemsex and 21% as a result of withdrawal from chemsex.<sup>15</sup> Particularly, mental health symptoms (e.g., depression, anxiety, withdrawal and dependence) and severe psychopathological symptoms (e.g., aggressive behaviour, paranoid thoughts and suicidal behaviours) were more severe among those who practiced slamsex.<sup>32-34</sup> From a prevention, health care and harm reduction perspective, part of results obtained are of concern. About half of the respondents reported some form of loss of control or were concerned about their slamming behaviour and that 26% had ever tried to stop slamming. The results further show that virtually none of the MSM used a condom during slamsex which includes a treat to become virally infected.

### **Strengths and limitations of the study**

The strengths of this study are the large number of respondents (n=176) for a difficult to reach population, the use of only ad hoc close ended questions, and the wide range of topics they were surveyed about. The main limitations of the study are the lack of structured sampling frame, the use of an ad hoc questionnaire, and the lack of a control group (MSM having chemsex but not slamming; MSM not having chemsex). The results should therefore be seen as a first, albeit broad, exploration of this topic with possible limitations regarding external validity/generalizability and internal validity. With regard to external validity, it should be noted that this is still largely a hidden population and thus the use of a strict sampling frame is not yet possible. Moreover, there were no female or heterosexual slammers present in the current study and, therefore, the results only apply to gay and bisexual male slammers. Regarding the internal validity, questions can be raised about the distinction between reported complaints and systematically assessed psychological disorders using (semi-)structured interviews. Also the self-reported need for treatment might not equal actual treatment seeking. For example, a recent study among MSM practicing chemsex found that the self-reported help-seeking behaviour did not always take place in reality.<sup>21</sup>

### **Conclusions and recommendations**

Although the prevalence of slamsex is increasing, it is (still) small phenomenon that is mainly limited to a small group of MSM. Therefore, slamsex, despite its many risks and negative consequences, still only has a limited effect on Dutch public health. Slamsex is associated with consciously chosen sexual risk behaviours (e.g., anal sex without condom) but also with a conscious avoidance of the risks related to the

slamming of drugs (e.g., no needle sharing). Slamsex seems to be related to many physical and psychological problems and a significant proportion of the slammers indicate that they need (professional) help and support. This research provides a detailed description of slamsex behaviour among MSM in 2020. However, part of results are of health concern and should be addressed by prevention and health care professionals. Regarding the health hazards found in this study, it is recommended that a follow-up study is executed with this group and a control population to correct for confounding variables that determine health outcomes in the group of slamsex users.

Apparently, traditional health care and addiction care services are not familiar with this specific group of drug users i.e., have poor knowledge of and insufficient experience with their practices. As suggested before by Scheibein et al.,<sup>14</sup> these issues need to be addressed by and integrated in professional health care programs. Current results may contribute to the development and updated provision of low-threshold, non-judgmental and well-informed prevention and harm reduction activities and support for MSM involved in slamsex.

### **Funding sources**

This research did not receive any specific funding.

### **Declarations of Interest**

The authors declare no conflicts of interest.

### **Data Availability Statement**

The integral report (in Dutch; 150 pp.) is available and can be requested via Mainline website: <https://mainline.nl/posts/show/14340/vraag-slammen-in-nederland-gratis-aan>

### **References**

1. Milhet M, Shah J, Madesclaire T, Gaissad L. Chemsex experiences: narratives of pleasure. *Drugs Alcohol Today* 2019; doi: 10.1108/DAT-09-2018-0043.
2. Pakianathan MR, Lee MJ, Kelly B, Hegazi A. How to assess gay, bisexual and other men who have sex with men for chemsex. *Sexually Transm Dis* 2016; 92(8): 568-70. doi: 10.1136/sextrans-2015-052405.
3. Race K, Murphy D, Pienaar K, Lea T. Injecting as a sexual practice: Cultural formations of ‘slamsex’. *Sexualities* 2021; 1363460720986924. doi: 10.1177/1363460720986924.
4. Evers YJ, Hoebe C, Dukers-Muijrs N, Kampman CJG, Kuizenga-Wessel S, Shilue D, et al. Sexual, addiction and mental health care needs among men who have sex with men practicing chemsex - a cross-sectional study in the Netherlands. *Prev Med Rep* 2020; 18: 101074. doi: 10.1016/j.pmedr.2020.101074.

5. Graf N, Dichtl A, Deimel D, Sander D, Stöver H. Chemsex among men who have sex with men in Germany: motives, consequences and the response of the support system. *Sexual Health* 2018; 15(2): 151-56. doi: 10.1071/sh17142.
6. Tan RKJ, Wong CM, Chen MI, Chan YY, Bin Ibrahim MA, Lim OZ, et al. Chemsex among gay, bisexual, and other men who have sex with men in Singapore and the challenges ahead: A qualitative study. *Int J Drug Policy* 2018; 61: 31-37. doi: 10.1016/j.drugpo.2018.10.002.
7. Van Hout MC, Crowley D, O'Dea S, Clarke S. Chasing the rainbow: pleasure, sex-based sociality and consumerism in navigating and exiting the Irish Chemsex scene. *Culture Health Sexuality* 2019; 21(9): 1074-86. doi: 10.1080/13691058.2018.1529336.
8. Wang Z, Yang X, Mo PKH, Fang Y, Ip TKM, Lau JTF. Influence of social media on sexualized drug use and chemsex among chinese men who have sex with men: Observational prospective cohort study. *J Med Internet Res* 2020; 22(7): e17894. doi: 10.2196/17894.
9. Edmundson C, Heinsbroek E, Glass R, Hope V, Mohammed H, White M, et al. Sexualised drug use in the United Kingdom (UK): A review of the literature. *Int J Drug Policy* 2018; 55: 131-48. doi: 10.1016/j.drugpo.2018.02.002.
10. Batisse A, Peyrière H, Eiden C, Courné M-A, Djeddar S. Usage de psychostimulants dans un contexte sexuel: analyse des cas rapportés au Réseau français des centres d'addictovigilance. Évaluation des risques liés à la pratique du SLAM [Use of psychostimulants in a sexual context: analysis of cases reported to the French network of addictovigilance centers. Risk assessment related to the practice of SLAM]. *Thérapies* 2016; 71(5): 447-55.
11. 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* 2019; 63: 74-89. doi: 10.1016/j.drugpo.2018.11.014.
12. Sewell J, Cambiano V, Miltz A, Speakman A, Lampe FC, Phillips A, et al. Changes in recreational drug use, drug use associated with chemsex, and HIV-related behaviours, among HIV-negative men who have sex with men in London and Brighton, 2013-2016. *Sexually Transm Dis* 2018; 94(7): 494-501. doi: 10.1136/sextrans-2017-053439.
13. McCall H, Adams N, Mason D, Willis J. What is chemsex and why does it matter? *Br Med J* 2015; 351: h5790. doi: 10.1136/bmj.h5790.
14. Scheibein F, Wells J, Henriques S, Van Hout M. Slam sex'-sexualised injecting drug use ('SIDU')- A scoping review. *J Homosexuality* 2020; 68(14): 2344-58. doi: 10.1080/00918369.2020.1804258
15. Whitlock GG, Protopapas K, Bernardino JI, Imaz A, Curran A, Stingone C, et al. Chems4EU: chemsex use and its impacts across four European countries in HIV-positive men who have sex with men attending HIV services. *HIV Med* 2021; 22(10): 944-57. doi: 10.1111/hiv.13160.
16. Daskalopoulou M, Rodger A, Phillips AN, Sherr L, Speakman A, Collins S, et al. Recreational drug use, polydrug use, and sexual behaviour in HIV-diagnosed men who have sex with men in the UK:

- results from the cross-sectional ASTRA study. *Lancet HIV* 2014; 1(1): e22-31. doi: 10.1016/s2352-3018(14)70001-3.
17. Schreck B, Victorri-Vigneau C, Guerlais M, Laforgue E, Grall-Bronnec M. Slam practice: A review of the literature. *Eur Addict Res* 2021; 27(3): 161-78. doi: 10.1159/000511897
  18. PHE. Public Health England (PHE), Health Protection Scotland, Public Health Wales, Public Health Agency Northern Ireland. Shooting up: infections among people who inject drugs in the United Kingdom 2013. 2014 [Available from: [www.gov.uk/government/publications/shooting-up-infections-among-people-who-inject-drugs-in-the-uk](http://www.gov.uk/government/publications/shooting-up-infections-among-people-who-inject-drugs-in-the-uk)]. Accessed January 7, 2022].
  19. Knoops L, Bakker I, van Bodegom R, Zantkuijl P. Tina en slammen. MSM, crystal meth-gebruik en het injecteren van drugs in een seksuele setting [Tina and slamming. MSM, crystal meth use and the injection of drugs in a sexual setting] 2020. 2021 [Available from: [https://mainline.blogbird.nl/uploads/mainline/Chemsexreport\\_pdf1.pdf](https://mainline.blogbird.nl/uploads/mainline/Chemsexreport_pdf1.pdf)]. Accessed December 29, 2021.
  20. Marillier M, Batisse A, Richeval C, Labrouve V, Martinez M, Allorge D, et al. CHEMSEX, NPS et réduction des risques et des dommages: Résultats préliminaires d'une étude pilote [CHEMSEX, NPS and risk and harm reduction: Preliminary results from a pilot study] *Tox Anal Clin* 2017; 29(2): S52. doi: 10.1016/j.toxac.2017.03.071
  21. Achterbergh RCA, van Rooijen MS, van den Brink W, Boyd A, de Vries HJC. Enhancing help-seeking behaviour among men who have sex with men at risk for sexually transmitted infections: the syn.bas.in randomised controlled trial. *Sex Transm Infect* 2021; 97(1): 11-17. doi: 10.1136/sextrans-2020-054438.
  22. Bui H, Zablotska-Manos I, Hammoud M, Jin F, Lea T, Bourne A, et al. Prevalence and correlates of recent injecting drug use among gay and bisexual men in Australia: Results from the FLUX study. *Int J Drug Policy* 2018; 55: 222-30. doi: 10.1016/j.drugpo.2018.01.018.
  23. Evers YJ, Levels L, Dukers-Muijers N, Hoebe C, Knoops L, Pelsser S, et al. Chemseks onder MSM: Informatiebrochure voor Centra Seksuele Gezondheid. GGD Zuid Limburg [Chemsex under MSM: Information brochure for Centers Sexual Health. GGD South Limburg ]. 2020. [Available from: [https://www.ggdzl.nl/fileadmin/files/ggdzl/Documenten/Informatiefolder\\_Chemseks.pdf](https://www.ggdzl.nl/fileadmin/files/ggdzl/Documenten/Informatiefolder_Chemseks.pdf)]. Accessed January 3, 2022.
  24. den Daas C, Adam PCG, Zuillhof W, de Wit JBF. Chemsex, drugs, and social connection: Sexualised drug use among MSM in the Netherlands (manuscript in preparation), 2021.
  25. Darke S, Kaye S, McKetin R, Duflou J. Major physical and psychological harms of methamphetamine use. *Drug Alcohol Rev* 2008; 27(3): 253-62. doi: 10.1080/09595230801923702.
  26. Drevin G, Rossi LH, Férec S, Briet M, Abbara C. Chemsex/slamsex-related intoxications: A case report involving gamma-hydroxybutyrate (GHB) and 3-methylmethcathinone (3-MMC) and a review of the literature. *Forensic Sci Int* 2021; 321: 110743. doi: 10.1016/j.forsciint.2021.110743.

27. Peters CMM, Evers YJ, Dukers-Muijers N, Hoebe C. Sexually transmitted infection and chemsex also highly prevalent among male sex workers outside Amsterdam, The Netherlands. *Sexually Transm Dis* 2020; 47(6): e15. doi: 10.1097/olq.0000000000001174.
28. Achterbergh RCA, de Vries HJC, Boyd A, Davidovich U, Drückler S, Hoornenborg E, et al. Identification and characterization of latent classes based on drug use among men who have sex with men at risk of sexually transmitted infections in Amsterdam, The Netherlands. *Addiction* 2020; 115(1): 121-33. doi: 10.1111/add.14774.
29. Achterbergh RCA, Drückler S, van Rooijen MS, van Aar F, Slurink IAL, de Vries HJC, et al. Sex, drugs, and sexually transmitted infections: A latent class analysis among men who have sex with men in Amsterdam and surrounding urban regions, The Netherlands. *Drug Alcohol Dep* 2020; 206: 107526. doi: 10.1016/j.drugalcdep.2019.06.028.
30. Drückler S, van Rooijen MS, de Vries HJC. Chemsex among men who have sex with men: a sexualized drug use survey among clients of the sexually transmitted infection outpatient clinic and users of a gay dating app in Amsterdam, The Netherlands. *Sexually Transm Dis* 2018; 45(5): 325-31. doi: 10.1097/olq.0000000000000753.
31. Evers YJ, Van Liere G, Hoebe C, Dukers-Muijers N. Chemsex among men who have sex with men living outside major cities and associations with sexually transmitted infections: A cross-sectional study in the Netherlands. *PLoS One* 2019; 14(5): e0216732. doi: 10.1371/journal.pone.0216732.
32. Íncera-Fernández D, Gámez-Guadix M, Moreno-Guillén S. Mental Health Symptoms Associated with Sexualized Drug Use (Chemsex) among Men Who Have Sex with Men: A Systematic Review. *Int J Environm Res Public Health* 2021; 18(24): doi: 10.3390/ijerph182413299.
33. Dolengevich-Segal H, Gonzalez-Baeza A, Valencia J, Valencia-Ortega E, Cabello A, Tellez-Molina MJ, et al. Drug-related and psychopathological symptoms in HIV-positive men who have sex with men who inject drugs during sex (slamsex): Data from the U-SEX GESIDA 9416 Study. *PLoS One* 2019; 14(12): e0220272. doi: 10.1371/journal.pone.0220272.
34. Dolengevich-Segal H, Rodríguez-Salgado B, Gómez-Arnau J, Sánchez-Mateos D. Severe psychosis, drug dependence, and hepatitis C related to slamming mephedrone. *Case Rep Psychiat* 2016; 2016: 8379562. doi: 10.1155/2016/8379562.

Table 1. Experience by Dutch MSM with substances during having sex (N=175). Data collected by an online survey (July 2020-January 2021).

Substance	Daily	Weekly	Monthly	Occasionally	Ever (experience)	%	Never (no experience)	%
Poppers	3	58	49	41	17	96.0%	7	4.0%
GHB	1	25	44	49	38	89.8%	18	10.2%
Methamphetamine	4	13	40	57	39	87.5%	22	12.5%
Ecstasy (MDMA) *	0	9	29	66	48	86.9%	23	13.1%
Ketamine	2	12	35	66	36	86.3%	24	13.7%
3-MMC	0	50	53	34	13	85.8%	25	14.2%
GBL	0	28	34	51	27	80.0%	35	20.0%
MDMA (ecstasy)*	0	2	16	53	48	78.0%	56	32.0%
Alcohol	8	15	20	35	36	65.1%	61	34.9%
Cannabis	7	11	17	40	38	64.6%	62	35.4%
Powder cocaine	1	6	8	41	52	61.8%	67	38.2%
Dexamphetamine (speed)	1	4	17	38	48	61.8%	67	38.2%
4-MMC (mephedrone)	0	3	15	30	55	59.8%	72	41.2%
4-MEC	0	2	2	26	44	42.3%	101	57.7%
Base cocaine (crack)	0	0	4	18	37	33.7%	116	66.3%
2-CB	0	0	1	5	32	21.8%	137	78.2%
LSD	0	1	0	7	27	20.0%	140	80.0%
Nitrous oxide	0	2	1	10	21	19.5%	141	80.5%
3-MEC	0	3	3	9	19	19.5%	141	80.5%
Other	0	0	4	3	5	18.3%	143	81.7%
4-FA (4-FMP)	0	0	2	11	16	16.6%	146	83.4%
Magic mushrooms	0	0	0	32	6	16.0%	147	84.0%
<i>Methoxetamine</i>	0	0	0	2	11	7.5%	162	92.5%
Heroin	0	0	0	0	2	0.9%	173	99.1%

GHB: gammahydroxybutyric acid; 3-MMC: 3-methylmethcathinone; 4-MMC: 4-methylethcathinone; 4-MEC: 4-methylethcathinone; 2-CB: 4-broom-2,5-dimethoxyphenethylamine; LSD: Lysergic acid diethylamide; 3-MEC: 3-methylethcathinone; 4-FA: 4-fluor-amphetamine. \* Ecstasy and MDMA are mentioned separately here, as this was the drug the user claimed was taken.

Table 2. Experience by Dutch MSM with “slamdrugs” during having sex (N=175; multiple answers possible). Data collected by an online survey (July 2020-January 2021).

Substance	Number (N=173)	Percentage
3-MMC (3-methylmethcathinone)	141	81.5%
Methamphetamine	138	79.8%
Ketamine	63	36.4%
4-MEC (4-methylethcathinon)	42	24.2%
Mephedrone (4-MMC)	36	20.8%
MDMA (ecstasy)	26	15.0%
Cocaine	21	12.1%
Speed	20	11.6%
3-MEC (3-methylethcathinone)	19	10.9%
MXE ( <i>methoxetamine</i> )	2	1.1%
Heroin	1	0.5%
Other substances	5	2.8%
Mix of multiple chemsex substances	26	15.0%

Table 3. Use of substances other than slamdrugs by Dutch MSM (multiple answers possible). Data collected by an online survey (July 2020-January 2021).

Substances	Number (N=173)	Percent
GHB/GBL	128	74.0%
Poppers	121	70.0%
Ketamine	64	37.0%
3-MMC	53	30.6%
Methamphetamine	48	27.7%
Cannabis	36	20.8%
Alcohol	22	12.7%
Speed	20	11.5%
Powder cocaine	20	11.5%
4-MMC (mephedrone)	10	5.8%

3-MMC: 3-methylmethcathinone.

Table 4. Sources for slam date(s) reported by Dutch MSM (multiple answers possible). Data collected by an online survey (July 2020-January 2021).

	Number (N=170)	Percent
Sex mates	126	74.1%
Dating-app	114	67.1%
Dating website	84	49.4%
Slam-party	50	29.4%
Circuit party	18	10.6%
Club/bar	11	6.4%
Sauna	9	5.3%
Darkroom	9	5.3%
‘Web-camming’	9	5.3%
Other	5	3.0%
Total number of sources	435 (435:170 = 2.6 slam date sources per respondent)	

Table 5. Psychological/mental complaints due to slamming (multiple answers possible) reported by Dutch MSM. Data collected by an online survey (July 2020-January 2021).

Psychological/mental complaint	Number (N=165)	Percent
Sleep problems	82	49.6%
Gloom	59	35.8%
Depressive feelings	57	34.5%
Being worked up	42	24.5%
Loneliness/socially isolated	39	23.6%
Anxiety and panic attacks	25	15.1%
Intense emotions/crying fits	25	15.1%
Psychoses/ delusions/hallucinations	22	13.3%
Self-harm	12	7.2%
Suicidal thoughts	8	4.8%
Other	8	4.8%