ORIGINAL ARTICLE

Chemsex-related drug use and its association with health outcomes in men who have sex with men: a cross-sectional analysis of Antidote clinic service data

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► Additional material is published online only. To view please visit the journal online (http://dx.doi.org/10.

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1136sextrans-2019-054040).

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Received 12 March 2019 Revised 7 May 2019 Accepted 13 May 2019



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To cite: Stevens O, Moncrieff M, Gafos M. Sex Transm Infect Epub ahead of print: [please include Day Month Year]. doi:10.1136/ sextrans-2019-054040

ABSTRACT Purpose Chemsex-related drug use (CDU) is an escalating public health issue among men who have sex with men (MSM), associated with significant physical, biomedical and psychosocial harm. Few interventions exist to help MSM engaging in chemsex and little data exist on which to build. This cross-sectional analysis, using data from Antidote, the UK's only lesbian, gay, bisexual, and transgender specialist drug service, aims to remedy this paucity of data.

Methods Modified Poisson regression was used to assess associations between CDU and a range of health outcomes; CDU+ subanalysis disaggregated MSM by primary chemsex drug of concern; and HIV+ subanalysis investigated whether CDU was associated with selfreported treatment adherence, HIV seroconversion and other HIV-specific issues.

Findings Compared with CDU- MSM, MSM presenting for CDU were more likely to be HIV+, current or previous injectors, to have used postexposure prophylaxis in the last year, and have had ≥ 6 sexual partners in the last 90 days, though less likely to be hazardous alcohol consumers or to have experienced previous suicidal ideation (all p<0.0005). CDU+ subanalysis revealed health outcome differences—those selecting mephedrone were less likely to be hepatitis C+, HIV+, current or previous injectors, or to have experienced previous suicidal ideation (all p<0.0005), whereas those selecting methamphetamine were more likely (all p < 0.0005, except suicidal ideation p = 0.009). Implications This analysis shows MSM presenting for CDU are a heterogeneous high-risk population with unmet health needs. There is a need for standardised chemsex surveillance and for improved intersectorial working between sexual health and drug treatment services. Future research should investigate typological differences between MSM presenting for CDU. Originality/value To date, this is the world's largest analysis of MSM seeking treatment for CDU. Further, the publication of 'real-world' service data is a valuable addition to the literature alongside surveys and recruited studies.

INTRODUCTION

Recreational and sexualised drug use in lesbian, gay, bisexual, and transgender (LGBT) populations is higher than that of the wider British heterosexual population.^{1–3} The past decade has seen the evolution of sexualised drug use in men who have sex

Key messages

- Men who have sex with men (MSM) seeking assistance for chemsex-related drug use (CDU+ MSM) are a high-risk population, above that of MSM presenting for alcohol or cocaine.
- Alcohol is an underappreciated drug of concern in CDU+ MSM
- CDU+ MSM are a heterogeneous population with diverse health needs, and service responses should reflect this.

with men (MSM), with new psychoactive substances superseding the drugs of yesteryear, chiefly among them gamma-hydroxybutyric acid (GHB)/gamma-butyrolactone (GBL), mephedrone and methamphetamine: the emergence of 'chemsex'.^{4 5} While many MSM engage in chemsex relatively safely and incur comparatively little harm, there are similarly many who shoulder the plethora of possible drug-related, sexual, and psychosocial harms.

Chemsex is currently at the forefront of MSM public health in England, though data remain sparse, featuring prominently within the Public Health England (PHE) Action Plan for MSM health 2015–2016⁶ and is also detailed as an area of focus within the 2017 UK Drug Strategy.⁷ PHE is taking a positive role in furthering the development of chemsex interventions and support, and has drawn up the 2017 PHE Chemsex Action Plan.⁸ It calls for 'evidence and data to support commissioning', to 'strengthen data collection in established surveillance systems and support new data collection' and to increase the use of service data rather than 'non-real world datasets' (*i.e.* surveys and recruited studies).

Without data on which to build, intervention design and programming remain difficult. Data from 56 Dean St, a London sexual health centre widely known for its chemsex support, show that of 874 MSM who consented to a brief intervention for drug use support, 98% had never previously accessed drug support.⁹ Those who do engage with services find that few chemsex interventions exist beyond those developed for injecting drug use and a small number of psychosocial interventions, lacking in formal evaluation. Given the scarcity of existing data and the difficulties faced in engaging this highly marginalised population, this analysis of routine data from Antidote, the UK's only LGBT-specific drug service, is a promising opportunity on which to base future interventions. It aims to determine whether MSM seeking assistance for chemsex-related drug use (CDU) are a higher risk population than MSM presenting for any other drug(s), and make recommendations to improve chemsex-related service provision.

METHODS

This study is a secondary analysis of Antidote data. Antidote is the UK's only LGBT drug and alcohol service, created in 2002 in response to the high prevalence of LGBT illicit drug use. It offers information, advice, and structured psychosocial treatment interventions at six London locations, and can be accessed either by walk-in or by referral from primary care or sexual health and drug services.

Sample

2442 unique service users completed the Initial Contact Form (online supplementary figure 1) during visits from 1 January 2012 to 12 June 2018, from which non-self-identifying men (n=121) and heterosexuals (n=4) were excluded, giving a final sample of 2297 MSM (online supplementary figure 2). Written consent was provided for the data to be used for routine service evaluation and improvement.

Data management and cleaning

All data were collected by interview and the Initial Contact Form was completed with the assistance of an Antidote care worker. Assessment of the Alcohol Use Disorder Identification Test (AUDIT-C) commenced later on 1 October 2014, therefore only 1335/2297 service users could have had an AUDIT-C score recorded. An AUDIT-C score ≥ 5 was categorised as AUDIT-C+. Service users presenting for CDU ('CDU+') were defined as individuals who identified methamphetamine, GHB/GBL, or mephedrone as drugs of concern on the Initial Contact Form. All other service users were defined as CDU–. No time frame is provided within the Initial Contact Form for 'currently injecting', consequently 'previously injected' and 'currently injecting' were aggregated into a single group.

Analysis

Drug use prevalence in Antidote service users was assessed as a single population and by CDU group. Unadjusted associations were assessed using modified Poisson regression with robust error variances¹⁰; associations with p<0.15 were considered in multivariate models to produce adjusted prevalence ratios (aPR) and 95% CIs. Variables with p<0.05 were retained in the final multivariate model. Analysis was conducted in STATA V.13 and graphs created in GraphPad Prism V.7.

RESULTS

Analysis 1

A total of 2297 MSM completed the Initial Contact Form, of whom 2137 (93%) identified a primary drug of concern (PDoC)—used as the denominator throughout the below analyses, of whom 1881 (88%) presented for CDU. Five hundred and nine service users (24%) identified one drug of concern, 655 (31%) identified two, and 973 (46%) identified three. CDU+ MSM were over three times as likely to identify \geq 2 drugs of concern than CDU– MSM (aPR 3.37; 95% CI 2.88 to 3.94; p<0.0005). In CDU+ MSM, mephedrone was the most frequently mentioned drug (n=1328; 71%), followed by GHB/GBL (n=1307; 69%), and methamphetamine (n=1210;

64%). Five hundred and forty (29%) listed all three drugs. In CDU– MSM, alcohol (n=147; 57%), cocaine (n=108; 42%), and cannabis (n=53; 21%) were the most frequently mentioned drugs.

The majority of service users were gay (95%), British (63%), white (84%), employed (68%), and in private accommodation (79%). The median age was 35.2 years (IQR 30.0–41.8). In multivariate analyses, being younger (under 45 years) or gay, and of black, Asian and minority ethnic (BAME) were associated with presenting for CDU (table 1).

Around half the service users were HIV- (53%), of whom 33% had used postexposure prophylaxis (PEP) in the last 12 months, previously or currently injected drugs (53%), and exhibited hazardous alcohol consumption (59%). Sixty-six per cent had ≥ 6 sexual partners in the last 90 days (median=10; IQR 3-25). Of current injectors, 40% shared needles or permitted others to inject them. A minority of service users were hepatitis C virus positive (HCV+; 9%), at risk of violence to or from others (4% and 5%, respectively), and had experienced previous suicidal ideation (15%). In multivariate analysis, presenting for CDU was positively associated with being HIV+, intravenous drug use (IVDU), using PEP in the last 12 months, and having ≥ 6 sexual partners/90 days; but negatively associated with previous suicidal ideation and hazardous alcohol consumption (figure 1 and online supplementary figure 3). In multivariate analysis (including adjusting for CDU), there is evidence that BAME MSM are one-third more likely to have had previous suicidal ideation than white MSM (aPR 1.35; 95% CI 1.00 to 1.83; p=0.048).

Analysis 2: CDU+ subanalysis

CDU+ subanalysis disaggregated by PDoC reveals substantial service user heterogeneity. Being younger or employed are independently associated with selecting mephedrone as a PDoC (both p < 0.0005), while being older or BAME are independently associated with selecting methamphetamine (both p < 0.0005) (table 2).

Considering sexual and mental health outcomes further illuminates disparities across service user populations. Those selecting mephedrone are less likely to: be HIV+, be HCV+, inject drugs, or have had previous suicidal ideation (all p<0.0005), although more likely to be hazardous drinkers (p=0.03). Conversely, selecting methamphetamine is positively associated with the above outcomes (all p<0.0005, except previous suicidal ideation p=0.009), but negatively associated with hazardous alcohol consumption (p=0.008). Those selecting GHB/GBL are less likely to inject drugs or be HIV+, but more likely to have past suicidal ideation (all p<0.0005) (figure 2 and online supplementary figure 4).

Analysis 3: HIV+ subanalysis

Of HIV+ MSM, around half attributed their HIV seroconversion to drug use (47%). A minority agreed that they initiated their drug use after HIV diagnosis (35%), rather that their existing drug use escalated after diagnosis (52%). The majority of HIV+ MSM were on antiretroviral therapy (ART; 85%), of whom half agreed that ongoing drug use interfered with their ART adherence (52%); and a small minority were HIV/ HCV coinfected (11%). No evidence exists for an association between CDU and these variables (online supplementary figure 5).

Table 1 Unadjusted and adjusted models of associations between sociodemographics and CDU

Variable Missing data (%)*		Total n (col%)	CDU+ n (row%)	Univariate PR (95% CI) p value (Wald test)	Multivariate PR (95% CI) n/ N=1689/2137 <i>p value (Wald test</i>)
Chemsex-related drug use	Yes	1881 (88.0)	_	-	-
	No	256 (12.0)	-	-	-
		2137			
Age (years) 9%	<25	193 (9.9)	181 (93.8)	1.27 (1.06 to 1.51)	1.26 (1.05 to 1.51)
	25–29	297 (15.2)	267 (89.9)	1.22 (1.02 to 1.45)	1.19 (0.99 to 1.44)
	30–34	463 (23.8)	425 (91.8)	1.24 (1.04 to 1.48)	1.23 (1.02 to 1.47)
	35–39	397 (20.4)	350 (88.2)	1.19 (1.00 to 1.42)	1.17 (0.97 to 1.40)
	40–44	275 (14.1)	244 (88.7)	1.20 (1.01 to 1.43)	1.17 (0.97 to 1.41)
	45–49	178 (9.1)	149 (83.7)	1.13 (0.94 to 1.36)	1.13 (0.93 to 1.37)
	50–54	100 (5.1)	77 (77.0)	1.04 (0.85 to 1.28)	1.00 (0.80 to 1.24)
	55+	46 (2.4)	34 (73.9)	1.00	1.00
		1949	1727	0.0004	0.0006
Sexuality	Gay	1985 (95.1)	1768 (89.1)	1.00	1.00
2%	Bisexual	73 (3.5)	52 (71.2)	0.80 (0.69 to 0.93)	0.89 (0.78 to 1.01)
	Other	30 (1.4)	18 (60.0)	0.67 (0.50 to 0.90)	0.59 (0.40 to 0.87)
		2088	1838	0.0004	0.0069
Nationality	British	1112 (63.4)	941 (84.6)	1.00	
18%	Other	641 (36.6)	578 (90.2)	1.07 (1.03 to 1.10)	
		1753	1519	0.001	
Ethnicity	White	1560 (83.6)	1337 (85.7)	1.00	1.00
13%	BAME	305 (16.4)	282 (92.5)	1.08 (1.04 to 1.12)	1.06 (1.02 to 1.10)
		1865	1619	0.0001	0.004
Employment	Full/part-time	1191 (68.1)	1040 (87.3)	1.03 (0.99 to 1.08)	
18%	Other	557 (31.9)	470 (84.4)	1.00	
		1748	1510	0.108	
Accommodation	Own	326 (20.5)	285 (87.4)	1.00	
26%	Rent	927 (58.3)	799 (86.2)	0.99 (0.94 to 1.03)	
	Other	336 (21.1)	283 (84.2)	0.96 (0.91 to 1.03)	
		1589	1367	0.496	

Bold values are column totals or p values for associated prevalence ratios.

*Of 2137 men who have sex with men (MSM) with CDU exposure status. Age p values are test for trend.

BAME, black, Asian, and minority ethnic; CDU, chemsex-related drug use; PR, prevalence ratio; col%, column percentage.

Missing data

Though missing data levels were high, extensive sensitivity analysis did not indicate that missing data had impacted on the above findings (data not shown—available on request from corresponding author).

DISCUSSION

To date, this study is the largest epidemiological analysis of MSM with problematic CDU in the UK. These findings show that being younger, gay, and BAME are each independently associated with presenting for CDU. Furthermore, presenting for CDU is associated with an increased risk of: being HIV+; using PEP in the last 12 months; having ≥ 6 sexual partners in the last 90 days; and currently or previously injecting drugs, and a decreased risk of hazardous alcohol consumption and previous suicidal ideation when compared with CDU– MSM. CDU+ subanalyses interrogated the role of the PDoC, revealing stark sociodemographic, sexual and mental health outcome disparities, highlighting that CDU+ MSM are far from a homogeneous population.

It should be emphasised that while many studies use non-drugs using MSM as control groups, here the control group comprised MSM who are themselves struggling with problematic drug use largely alcohol and cocaine. Accordingly, the control prevalences with which we compare CDU+ MSM are higher than those in, and not representative of, the wider MSM population. $^{11-14}$

Ethnicity

17.4% of CDU+ MSM were BAME—similar to that of other studies of CDU+ MSM (12%–18.5%^{12 14–16}). BAME MSM are 6% more likely to present for CDU than white MSM, though the literature reports that CDU is associated more with white than BAME MSM.¹² It may be the case that though proportionally fewer BAME MSM engage in CDU, they are over-represented in MSM with problematic drug use due to increased societal and psychosocial stressors relative to white MSM.^{17–19} Without reliable prevalence estimates for CDU in the UK, this small difference is difficult to evaluate. Mental health inequalities along ethnic gradients seen in heterosexual men are preserved in MSM,²⁰ and also found in these data. However, associations between ethnicity and HIV, being on ART, or use of PEP, widely reported in the literature are not found in this analysis.^{17 19 21}

STIs and IVDU

Here we show that CDU is associated with an increased risk of: being HIV+, ever injecting, using PEP, and having more sexual partners. It is of note that though these associations are now well



Figure 1 Unadjusted and adjusted models between CDU (exposure) and sexual and mental health outcomes. Prevalence ratios with 95% CIs. P value from Wald test. All models adjusted for age and A: employment status, B: –, C: employment status, D: employment status, E: accommodation status, F: nationality, G: nationality, H: ethnicity and employment status. @HIV– men only. AUDIT-C, Alcohol Use Disorder Identification Test; HCV, hepatitis C virus; IVDU, intravenous drug use; PEP, postexposure prophylaxis.

documented in previous studies in CDU+ MSM populations, here the underlying outcome prevalences of HIV, PEP use, and IVDU are higher,^{9 11 12 14 16 22 23} reflecting the high-risk population of MSM with problematic drug use. The proportion of HIV+ MSM on ART,^{9 13 22} HIV/HCV coinfection, and HCV monoinfection^{9 15 24} seen in this study are consistent with those found elsewhere, though we do not find an association between CDU and HCV as reported in the literature.^{14 16 25}

Since the emergence of chemsex, IVDU in MSM has grown,⁵ but remains of low prevalence (*circa* 2%¹¹ ¹² of which *circa* 90% is of mephedrone and methamphetamine).¹¹ By contrast, this analysis drew from a high-risk population, of whom 53% had ever injected and a further 38% were current injectors, the vast majority of whom were CDU+. Here we find that 40% of current injectors engage in dangerous injection practices—a combined measure of needle sharing and permitting others to inject them—consistent with 2014 figures from Antidote, but a decrease from 2013.⁵ These high levels of IVDU and dangerous injecting practices are reflected in data collected from CDU+ MSM in London sexual health clinics.^{14 15 22}

Qualitative accounts report that CDU+ MSM perceive a risk spectrum within the chemsex environment.²⁶ Lower risk behaviours include the use of mephedrone with GHB/GBL, eschewing IVDU and having protected sex. At the opposite end of the spectrum is use of methamphetamine with GHB/GBL, engaging in IVDU, and HIV/HCV serodiscordant sex. This analysis shows that service users who are younger and employed are more likely to select mephedrone as their PDoC, while MSM for whom their PDoC is methamphetamine are older. Furthermore, we show that disaggregating CDU+ MSM by PDoC reveals starkly different associations with respect to HIV, HCV, IVDU, and previous suicidal ideation. Thus, we show that the needs of CDU+ MSM are heterogeneous and service responses should reflect this. Warning a 25-year-old HIV– man who uses exclusively mephedrone and does not identify with HIV+ methamphetamine injectors on the risks of sharing injecting equipment does not 'make every contact count', and indeed may discourage future engagement with services. This may be of particular note for professionals in areas whose familiarity with chemsex/CDU is limited. Latent class analysis has hitherto not disaggregated by chemsex-related drug.²³ Future work should look to apply typological analysis to chemsex-related drugs specifically, and longitudinal studies may wish to investigate the incidence of methamphetamine/injecting initiation as an interesting approach to the maturation of CDU behaviour.

Alcohol

The proportion of CDU+ MSM scoring AUDIT-C+ is highly concerning (54%), of whom 80% fail to identify alcohol as a drug of concern. High-risk alcohol consumption, so normalised within the MSM community that a large majority do not identify it as a problem, appears to be slipping under our radar as we are distracted by IVDU and methamphetamine which we know to be of high risk. Indeed, the impact of alcohol consumption goes above and beyond the acute and chronic harms associated with the drug, and is associated with event-level sexual risk behaviour and HIV acquisition.²⁷ Aiming to reduce sexual risk behaviour in CDU+ MSM by focusing exclusively on illicit drug harm reduction and use management is, therefore, a losing battle. Alcohol consumption screening, and ideally alcohol brief interventions, should be introduced in sexual health settings and it is important that neither service providers nor the community loses sight of hazardous alcohol consumption which, despite the emergence of the high-risk chemsex drugs, continues to cause extensive damage within the LGBT community.

Table 2 Adjusted models for the association between sociodemographics and PDoC in CDU+ subanalysis										
			GHB (n=243)		Methamphetamin	e (n=874)	Mephedrone (n=764)			
		Total n (col%)	n (row %) Missing data (%)	Multivariate aPR (95% CI) <i>p value</i> (Wald test)	n (row %) Missing data (%)	Multivariate aPR (95% CI) <i>p value</i> (Wald test)	n (row %) Missing data (%)	Multivariate aPR (95% CI) p value (Wald test)		
Age (years)	<25	181 (10.5)	34 (18.8)	1.32 (0.50 to 3.51)	57 (31.5)	0.38 (0.27 to 0.53)	90 (49.7)	5.09 (1.73 to 14.95)		
	25–29	267 (15.5)	38 (14.2)	1.21 (0.46 to 3.17)	106 (39.7)	0.53 (0.40 to 0.70)	123 (46.1)	4.03 (1.37 to 11.83)		
	30–34	425 (24.6)	57 (13.4)	1.12 (0.43 to 2.87)	181 (42.6)	0.55 (0.43 to 0.71)	187 (44)	3.86 (1.32 to 11.29)		
	35–39	350 (20.3)	39 (11.1)	0.82 (0.31 to 2.15)	172 (49.1)	0.73 (0.58 to 0.93)	139 (39.7)	3.16 (1.08 to 9.30)		
	40-44	244 (14.1)	34 (13.9)	1.26 (0.48 to 3.30)	111 (45.5)	0.67 (0.51 to 0.86)	99 (40.6)	3.11 (1.05 to 9.19)		
	45–49	149 (8.6)	9 (6.0)	0.32 (0.09 to 1.12)	97 (65.1)	0.90 (0.70 to 1.16)	43 (28.9)	2.48 (0.82 to 7.48)		
	50–54	77 (4.5)	7 (9.1)	0.52 (0.14 to 1.94)	48 (62.3)	0.82 (0.61 to 1.10)	22 (28.6)	2.82 (0.90 to 8.87)		
	55+	34 (2.0)	4 (11.8)	1	25 (73.5)	1	5 (14.7)	1		
		1727	222	0.0345	797	<0.0001	708	<0.0001		
			9%		9%		7%			
Sexuality	Gay	1768 (96.2)	225 (12.7)		824 (46.6)		719 (40.7)			
	Bisexual	52 (2.8)	12 (23.1)		21 (40.4)		19 (36.5)			
	Other	18 (1.0)	2 (11.1)		10 (55.6)		6 (33.3)			
		1838	239		855		744			
			2%		2%		3%			
Nationality	British	941 (61.9)	136 (14.5)		474 (50.4)		331 (35.2)			
	Other	578 (38.1)	75 (13.0)		267 (46.2)		236 (40.8)			
		1519	211		741		567			
			13%		15%		26%			
Ethnicity	White	1337 (82.6)	188 (14.1)	1	638 (47.7)	1	511 (38.2)			
	BME	282 (17.4)	24 (8.5)	0.55 (0.35 to 0.88)	154 (54.6)	1.16 (1.01 to 1.32)	104 (36.9)			
		1619	212	0.011	792	0.034	615			
			13%		9%		20%			
Employment	Full/part- time	1040 (68.9)	121 (11.6)	0.74 (0.55 to 0.98)	467 (44.9)	0.82 (0.73 to 0.92)	452 (43.5)	1.48 (1.26 to 1.73)		
	Other	470 (31.1)	77 (16.4)	1	253 (53.8)	1	140 (29.8)	1		
		1510	198	0.037	720	0.001	592	<0.0001		
			19%		18%		23%			
Accommodation	Own	285 (20.8)	32 (11.2)		154 (54)		99 (34.7)			
	Rent	799 (58.4)	114 (14.3)		360 (45.1)		325 (40.7)			
	Other	283 (20.7)	42 (14.8)		141 (49.8)		100 (35.3)			
		1367	188		655		524			
			23%		25%		31%			

Age p values are test for trend.

Bold values are column totals or p values associated with prevalence ratios.

BME, black and minority ethnic; CDU, chemsex-related drug use; GHB, gamma-hydroxybutyric acid; PDoC, primary drug of concern; aPR, adjusted prevalence ratio.

Specialist services

The Antidote service user population demonstrates great unmet health needs and Antidote, staffed exclusively by health workers who identify as LGBT, offers a non-judgemental safe space for MSM. This analysis has shown, among others, that Antidote's CDU+ MSM population is one at high risk. Taking a wider perspective, the UK is currently experiencing a resurgence in STIs with a disproportionate number of new infections found within MSM.²⁸ Seventy-three per cent and 98% of attendees to the Club Drug Clinic and 56 Dean St respectively had never previously accessed drug use support, representing a sizeable treatment gap.9 15 Specialist services consequently provide an opportunity for health services to engage with an otherwise invisible population who do not present to regular services, offering health advice whether directly chemsex related or not. It may prove that specialist chemsex services, engaging previously uncaptured high-risk individuals who sustain STI epidemics within their sexual networks, cause a propagative decrease in STIs throughout the wider MSM population. Further, half of HIV+ MSM in this study attribute their seroconversion to drug use. Specialist chemsex services, directing MSM towards testing, prophylaxis and treatment, could markedly decrease the cost of both STI treatment and lifetime HIV care, and should not be overlooked from a commissioning perspective.

Such services should be provided under a model of integrated care, whether providing services under a single roof, or through establishing effective, rapid care referral pathways between services.^{29 30} Specialist LGBT services, however, have been subjected to little evaluation and no conclusions are available concerning their efficacy above current standard of care. Bowden-Jones rightly notes 'in the absence of a clearer evidence base, it would seem sensible to develop services incrementally, rather than suggesting radical and expensive redesign.'³⁰ Data collection, expertise sharing and basic reciprocal competency training for sexual health and drug treatment staff are relatively inexpensive recommendations which would likely improve the wider holistic health of CDU+ MSM.

LIMITATIONS

As with all cross-sectional studies there is no implication of causality in the associations presented here. Though the



Figure 2 Adjusted models for the association between PDoC and health outcomes in CDU+ subanalysis. Adjusted prevalence ratios and 95% Cls. Wald test p values. Only associations with p<0.05 in multivariate analysis displayed—see online supplementary figure 4 for full data. All models adjusted for age and A: employment status, B: ethnicity and employment status, C: -, D: -, E: nationality, F: employment status, G: employment status, H: -, I: -, J: nationality, K: employment status, L: ethnicity and accommodation status, M: employment status. @Maximum model size=1881 unless stated. AUDIT-C, Alcohol Use Disorder Identification Test; CDU, chemsex-related drug use; GHB, gamma-hydroxybutyric acid; HCV, hepatitis C virus; IVDU, intravenous drug use; PDoC, primary drug of concern.

methodology and analysis is cross sectional in design, these data were collected over a 6-year period. During this time, staff turnover and modifications to the Initial Contact Form may have influenced service users' responses. Antidote staff receive extensive training to minimise interviewer biases, and ensure consistency between staff. Modifications to the form are infrequent. Furthermore, the social norms and drug trends that underpin the chemsex environment evolve rapidly, far slower than surveillance tools, meaning that the Initial Contact Form may be overlooking emerging harms or novel substances. This is a limitation both of this study, and of chemsex surveillance more broadly.

These data are not recorded at the event level and consequently this analysis reports CDU+ MSM, rather than chemsex+ MSM. The use of CDU as a proxy for chemsex as a behaviour itself is common, but does not account for CDU outside of a chemsex risk environment. These data are derived almost exclusively from MSM living in London and may consequently not reflect MSM with problematic drug use across other areas of the UK. Recent experiences may influence subjective rankings of drugs of concern-a recent GHB overdose may be weighted as more concerning than 18 months of injecting drug use. This is particularly influential in CDU+ subanalysis. Though a CDU+ service user may list a given drug as their PDoC, it does not mean that he does not use the other two chemsex-related drugs, or any other CDU- drug. Polydrug use was too prevalent within the CDU+ group to analyse only MSM who listed a single chemsex drug. Further, data are only collected on drugs of concern at the time of presentation and cannot take account of unrecorded prior drug use and associated risk behaviour. Finally, self-reporting of health status may have introduced bias, particularly relevant for deeply personal issues such as interpartner violence, sexual assault, and mental health, though Antidote's wholly LGBT staff, excellent reputation as a non-judgmental safe space and rigorous staff training will minimise their under-reporting.

Handling editor Tristan J Barber

Contributors OS conceived the study, conducted the analysis and wrote the manuscript. MM provided the data and reviewed the manuscript. MG conceived the study and reviewed the analysis and manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval London School of Hygiene and Tropical Medicine (Ethics No 14779).

Provenance and peer review Not commissioned; externally peer reviewed. Data sharing statement No data are available.

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