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Emergence of cocaine and methamphetamine injection among HIV-positive injection drug users in Northern and Western India

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Abstract

Background—Little is known regarding the epidemiology of drug injection and risk behaviors among injection drug users (IDUs) across India. In particular, there is limited data on the prevalence of stimulant injection.

Methods—We sampled 801 HIV positive IDUs from 14 locations throughout India to represent the geography of India as well as the diversity in IDU epidemic stage (established epidemics, emerging epidemics and large cities). All participants underwent a behavioral survey and blood draw. Given prior associations with stimulant injection and HIV risk, we compared stimulant injectors (cocaine and/or methamphetamine) to those who injected opiates and/or pharmaceuticals only.

Results—The median age was 33; 86% were male. The primary drugs injected were heroin, buprenorphine and other pharmaceuticals. In all but four sites, >50% of those actively injecting reported needle sharing. Stimulant injection was most common in emerging epidemics. Compared to exclusive opiate injectors, stimulant injectors were significantly younger, more likely to be educated and employed, more likely to report non-injection use of heroin, crack/cocaine and amphetamines, heavy alcohol use, recent needle sharing (71% vs. 57%), sex with a casual partner (57% vs. 31%) and men having sex with other men (33% vs. 9%; $p < 0.01$ for all).

Conclusions—Emerging IDU epidemics have a drug/sexual risk profile not previously been observed in India. Given the high prevalence of stimulant injection in these populations, HIV prevention/treatment programs may need to be redesigned to maximize effectiveness. The high

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Contributors

Shruti Mehta and Sunil Solomon designed the study, oversaw the analysis of data, drafted the manuscript. Aylur Srikrishnan and Canjeevaram Vasudevan implemented the study and led all aspects of data collection. Suniti Solomon and Suresh Kumar provided technical guidance and reviewed the final manuscript. Eva Noble analyzed the data and helped to draft the manuscript. All authors have approved the final manuscript.

Conflict of Interest

No conflicts

levels of injection sharing overall reinforce the need to ensure access to harm-reduction services for all.

Keywords

HIV/AIDS; cocaine; Amphetamine-type stimulants; injection drug use; India

1. Introduction

Globally, there are an estimated 14 – 52.5 million amphetamine-type stimulant (ATS) users and 13.2–19.5 million cocaine users (United Nations Office on Drugs and Crime, 2012). While cocaine use has historically been most prevalent in the Americas, Europe and Oceania, recent data suggests increases over the past five years in Africa and Asia (United Nations Office on Drugs and Crime, 2013). Over this same time period, ATS seizures have reached an all time high with increases being reported across all regions including North America, Europe and Asia; this trend is being driven by increases in methamphetamine seizures (United Nations Office on Drugs and Crime, 2013).

Use of stimulants, particularly by injection, has been associated with risky injection and sexual behavior (Corsi and Booth, 2008; Freeman et al., 2011), putting users at high risk for HIV acquisition and transmission via parenteral and sexual routes (Booth et al., 2008; Chawarski et al., 2012; Parry et al., 2011). Moreover, unlike opiates for which there is substitution therapy, there is no pharmacologic treatment for ATS or cocaine use. Despite the recognized link between stimulant injection and risk for HIV, there is limited data on the global epidemiology of stimulant injection and its associated risk profile.

India, home to an estimated 1.1 million IDUs (Aceijas et al., 2006), with HIV prevalence at 10%–30% (Aceijas et al., 2004; Mahanta et al., 2009, 2008; Solomon et al., 2008), is situated in an environment vulnerable to drug use bordered by the Golden Crescent (Afghanistan, Iran and Pakistan) on the west and the Golden Triangle (Burma, Laos and Thailand) on the east (Figure 1). Prior to the early 21st century, the Golden Triangle was the world's largest producer of heroin. Currently the Golden Crescent, specifically Afghanistan, accounts for the majority of global heroin trafficking. Historically, in India, the heaviest burden of drug injection has been in the northeastern states in part due to their proximity to the Golden Triangle and overland heroin trafficking routes. In addition, epidemics have been observed in large metropolitan centers (e.g., New Delhi, Chennai, Calcutta; Baveja et al., 2003; Kumar et al., 2000; Panda et al., 1997; Solomon et al., 2010). However, over the past decade, reports of injection drug use have emerged from other regions of India; in particular a high burden of opiate (primarily pharmaceutical) injection has been reported in the northern states of Punjab and Haryana (Ambekar, 2012; Ambekar and Tripathi, 2008; Jindal et al., 2008; Yardley, 2012), states which border Pakistan and Afghanistan. Little is known about IDUs and their risk behaviors in these regions where epidemics are emerging; further, despite anecdotal evidence suggesting increased use of stimulants (Tiwar, 2013), there is limited data from India on drugs other than opiates. Accordingly, we characterize the epidemiology of drug injection and associated risk behaviors among IDUs in 14 cities throughout India with a particular emphasis on identifying the prevalence of stimulant injection.

2. METHODS

2.1 Study Population

We sampled 801 persons from October, 2009 to January, 2011 with a history of injection drug use across 14 sites in India for a study to examine the genetic diversity of HIV and

HCV among IDUs in India (Figure 1). There were 234 participants from 4 sites in the Northeast (Guwahati, Assam [AS]; Imphal, Manipur [MP]; Aizawl, Mizoram [MZ]; and Dimapur, Nagaland [NG]); 294 participants from 5 sites in the North (Amritsar, Punjab [PB]; Faridabad, Haryana [HY]; Ghaziabad, Uttar Pradesh [UP]; Jaipur, Rajasthan [RJ]; New Delhi [ND]); 91 participants from 2 sites in the West (Panaji, Goa [GA]; Mumbai, Maharashtra [MH]); 60 participants from 1 site in the East (Kolkata, West Bengal [WB]); and 122 participants from 2 sites in the South (Chennai, Tamil Nadu [TN]; Ananthapur, Andhra Pradesh [AP]). These locations were also selected to represent drug use epidemics of varying stages: established epidemics (AS, MP, MZ, NG), emerging epidemics (PB, HY, UP, RJ, GA, AP) and large cities (ND, MH, WB, TN).

In each location, we partnered with an existing non-governmental organization (NGO) that worked with IDUs. Each of these NGOs maintained a roster of all IDUs visiting their center including HIV and ART status of each individual. From the list of HIV-positive individuals, we selected a random sample of antiretroviral-naïve individuals (every third person in the roster was selected until the desired sample size was reached). Individuals were eligible if they were HIV positive, antiretroviral naïve, reported drug injection in the prior two years and were 18 years old. The study was approved by the Johns Hopkins University and YR Gaitonde Centre for AIDS Research and Education Institutional Review Boards and all participants provided oral informed consent as no identifiers were collected. Participants were compensated 200 Indian Rupees – the average daily wage of an IDU in India (approximately 3.5 US Dollars for their time).

2.2 Data collection

A survey was administered to each participant by a trained interviewer in a private room. The survey was developed in English, translated and administered to participants in their local language. The survey included information about demographics, lifetime and recent drug-related risk behavior, drug acquisition, and perceived need for services among IDUs in the region. It was developed using questions that had previously been used in cohorts of IDUs in the US (Vlahov et al., 1991) and in a cohort of IDUs in Chennai, India (Solomon et al., 2010). Dried blood spot specimens were also collected.

2.3 Statistical Analysis

We compared demographic characteristics and risk behaviors by epidemic stage (established epidemics, emerging epidemics and large cities) using chi-squared tests for categorical variables and linear regression for continuous variables. P values were corrected for the clustering within survey sites. As prior reports have demonstrated that stimulant use/injection is associated with higher HIV-related risk behavior (Corsi and Booth, 2008; Freeman et al., 2011), we further compared persons who reported any recent (past six months) injection of stimulant to those who reported only injecting opiates and/or pharmaceutical drugs using similar analytical methods. Self-reported stimulant injection was considered to be injection of cocaine and/or methamphetamine regardless of whether persons also injected other types of drugs. Analyses were conducted using STATA Version 12.0 (College Station, Texas).

3. RESULTS

Among 801 persons, the median age was 33 (interquartile range [IQR], 28–38) and 86% were male. The median age at initiation of drug injection was 20 years (IQR, 18–25). All were HIV positive and 75% were HCV antibody positive. Characteristics by IDU epidemic stage and region are listed in Table 1a.

Compared to participants in emerging epidemics and large cities, participants in states with established epidemics tended to be better educated and more likely to be employed ($p < 0.01$ for all). A history of heroin injection was more commonly reported in established epidemics (79%) and large cities (87%) than in cities with emerging epidemics (48%, $p < 0.0001$), whereas a history of buprenorphine injection was more commonly reported in emerging epidemics (52%) and large cities (53%) compared to established epidemics (8%, $p < 0.0001$). Cocaine and methamphetamine injection were most commonly reported in emerging epidemics (19% and 7%, respectively; $p < 0.001$ both). Other pharmaceutical drugs (primarily opiates such as spasmoproxyvon and benzodiazepines such as diazepam) were equally reported across all three groups (67%–75%; $p = 0.09$). The proportion who reported daily injection was highest in the large cities (82%) compared with established epidemics (37%) and emerging epidemics (45%); $0 < 0.001$, whereas the proportion who reported needle sharing was comparable across all three groups (53%–61%; $p = 0.21$). Participants in established epidemics (69%) and emerging epidemics (65%) were significantly more likely to be sexually active (vs. 52% in large cities, $p < 0.001$), while persons in cities with emerging epidemics were significantly more likely to report recent sex with a casual partner (45%) or MSM (23%; $p < 0.0001$ for both).

Overall, participants reported a history of any stimulant injection in 10 sites, with participants in 10 sites reporting ever injecting cocaine (76% in Goa, 28% in Haryana and 13% in Andhra Pradesh) and participants in 6 sites reporting ever injecting methamphetamine (27% in Goa, 12% in Andhra Pradesh and 6% in Punjab). We further compared persons who reported *any* stimulant injection in the prior six months ($n = 82$) to those who reported *only* opiate and/or pharmaceutical drug injection (Table 1b). Of the persons who reported stimulant injection, 67 (82%) also reported injection of opiates or other pharmaceuticals. Compared to exclusive opiate/pharmaceutical injectors, persons who injected stimulants were significantly more likely to be younger, have higher educational attainment and have stable employment (i.e., monthly wages). Persons who injected stimulants were significantly less likely to inject heroin, but were no less likely to be injecting buprenorphine or other pharmaceutical drugs. Persons who injected stimulants were significantly less likely to be daily injectors, but were significantly more likely to report recent needle sharing, non-injection drug use and heavy alcohol use ($p < 0.01$ for all). They were also more likely to be sexually active, to report having a casual sex partner and be MSM ($p < 0.01$ for all). Finally, we characterized preference for heroin injection, availability and cost. Compared to exclusive opiate/pharmaceutical injectors, those who injected stimulants were significantly less likely to report a preference for heroin/opiate injection, reported more difficulty in accessing heroin and reported higher cost of heroin.

4. DISCUSSION

This study represents one of the first efforts to characterize the epidemiology of drug injection across multiple regions in India, including some areas not previously studied (e.g., Goa, Andhra Pradesh, Rajasthan, Uttar Pradesh). Consistent with what is known about drug injection in India, we observed a predominance of heroin and other opiate injection, including buprenorphine, across all regions of India regardless of stage of IDU epidemic. However, we also noted a high prevalence of stimulant injection in cities with emerging epidemics in Northern and Western India; importantly, stimulant injection was associated with higher injection-related and sexual risk behavior including MSM.

Overall, we observed a high prevalence of risk behavior with more than 50% reporting sharing needles in the prior six months in all but four settings. This is particularly concerning given that all were HIV positive and aware of their status. Beyond sharing, it is noteworthy that there was some diversity in the behavioral and risk profiles across the 14

cities in this study. For example, injection among women has rarely been reported outside of northeastern India (United Nations Office on Drugs and Crime, 2012), but nearly half of our sample in Andhra Pradesh and Goa were women. There was also some diversity in the types of drugs injected, with heroin being the primary drug injected in all sites except the North where most reported injecting buprenorphine and other pharmaceuticals.

We observed the highest prevalence of stimulant injection in the western state of Goa, considered by many to be the 'party capital' of India. Though there are no reports in the scientific literature, there have been reports in the popular press suggesting that Goa has become a principal hub of drug trade and consumption in India, potentially due to its relatively unprotected coastline (The Times of India, 2008). It has also been suggested that as customs and security have increased in other coastal cities such as Mumbai, drugs are increasingly arriving in Goa via air from Russia and via sea from Southeast Asia, Africa and Europe (9NewZ, 2012; Goa Chronicle, 2012). Beyond Goa, cocaine injection was frequently reported in two sites in the North and in Maharashtra. In Maharashtra, reports in the popular press have suggested that the number of drug seizures and persons arrested for drug use have increased between 2011 and 2012, with an increasing proportion being associated with stimulants (The Indian Express, 2013). Despite these reports in the popular press, there have been no historical or recent scientific reports of stimulant injection from any region in India (Dorabjee and Samson, 2000; Mahanta et al., 2008; Sarkar et al., 2006; Sarna et al., 2012).

Stimulant injection in these regions is of concern because it has been demonstrated that use/injection of stimulants might contribute to increased risk of HIV transmission through behavioral and biological pathways. Stimulant use may be associated with increased libido and impaired judgment, which may lead to high-risk sexual and injection practices (Colfax et al., 2010; Degenhardt et al., 2010). In this analysis, injection and sexual risk behaviors were more frequently reported by stimulant than opiate injectors. In particular, we observed a high prevalence of MSM in regions where stimulant injection was reported. Overlapping MSM and IDU HIV epidemics have not previously been described in India and can be important for identifying regions at high risk for HIV transmission and for targeting resources.

Future studies should characterize service utilization and needs among stimulant injectors as well as the reasons behind stimulant injection. Stimulant injectors tended to be of higher socioeconomic status compared to those who reported opiate/pharmaceutical injection only. Despite this, it was interesting that nearly 60% of persons injecting stimulants reported a preference for opiates. Moreover, stimulant injectors reported lower availability of heroin and higher cost suggesting that the reasons for stimulant injection in this population are likely multifactorial and may reflect a combination of availability and affordability. In terms of services, harm reduction services that traditionally target opiate injectors, including opiate substitution therapy and needle exchange programs, may not be reaching stimulant injectors or may not be providing the services they need. In particular, these programs do not likely offer counseling related to sexual transmission, which is much more relevant to stimulant injectors.

We were limited by small sample size in each site as well as the selection criteria (e.g., HIV positive, antiretroviral naïve), which were critical to the primary aims of the study. Prior reports have been mixed with some suggesting that HIV positive IDUs have higher risk than HIV negative IDUs (Solomon et al., 2008) and others suggesting that IDUs reduce risk after an HIV diagnosis. It is difficult to predict in which direction the bias would operate, but all HIV positive IDUs in this study were aware of their status, making the high levels of needle sharing concerning regardless. Moreover, because our primary objective was related to viral diversity, we did not collect detailed information on sexual and injection-related risk

behavior so we cannot comment on the prevalence of unprotected sexual intercourse, for example.

In conclusion, it appears that emerging IDU epidemics in Western and Northern India have a drug and sexual risk profile that has not previously been observed in India. Future studies should explore in more depth the reasons for this different risk profile, the links with transmission of HIV and hepatitis C virus as well as the service needs of these vulnerable populations, which may be different from the traditional primarily opiate injectors in India. Moreover, given the higher prevalence of stimulant injection in these populations, HIV prevention and treatment programs may need to be redesigned to maximize effectiveness. The high levels of injection sharing in these populations also reinforce the need to ensure improved access to harm-reduction services for all.

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Figure 1.

Study Sites. Study sites were selected to represent the geographic diversity of India as well as injection drug use epidemics of varying stages (established epidemics, emerging epidemics and large cities).

Table 1

a. Characteristics of participants by study site¹ (n=801)

	ESTABLISHED EPIDEMICS					EMERGING EPIDEMICS					LARGE CITIES				
	AS	MP	MZ	NG	South	West	HY	PB	North	UP	TN	South	West	North	East
Number of participants	48	63	60	63	61	37	53	70	60	51	61	54	60	60	
Median age (yrs)	38	35	30	31	32	35	28	29	32	34	40	30	36	34	
IQR	34,41	32,38	26,35	26,36	27,38	28,40	25,32	25,35	26,40	29,41	34,43	24,35	30,41	30,38	
Gender															
Male	100	98.4	78.3	65.1	47.5	54.1	100	100	96.7	100	98.4	94.4	100	93.3	
Female	0	1.6	21.7	34.9	42.6	43.2	0	0	3.3	0	1.6	5.6	0	6.7	
Hijrah	0	0	0	0	9.9	2.7	0	0	0	0	0	0	0	0	
Median age at 1 st injection (yrs)	21	19	18	19	24	22	21	20	21	27	18	17	23	18	
IQR	19,25	17,21	17,22	17,20	22,32	19,25	20,26	16,25	18,27	30,32	17,20	14,22	19,29	17,20	
Married	56.3	58.7	31.7	60.3	63.9	43.2	37.7	25.7	20.0	56.9	45.9	25.9	20.0	70.0	
Education															
None	4.2	1.6	1.7	28.6	24.6	0	24.5	52.9	43.3	47.1	29.5	33.3	48.3	26.7	
Primary school	16.7	14.3	6.7	23.8	36.1	18.9	24.5	31.4	46.7	27.5	49.2	51.9	31.7	56.7	
Secondary school	50.0	28.6	21.7	27.0	13.1	32.4	32.1	12.9	1.7	11.8	6.6	7.4	13.3	15.0	
High school or more	29.2	55.6	70.0	20.6	26.2	48.7	18.9	2.9	8.3	13.7	14.8	7.4	6.7	1.7	
Employment															
Unemployed	43.8	55.6	53.3	44.4	16.4	24.3	9.4	40.0	40.0	27.5	13.1	25.9	3.4	30.0	
Daily wages	35.4	15.9	23.3	38.1	63.9	24.3	60.4	45.7	46.7	54.9	77.1	70.4	81.4	41.7	
Weekly wages	4.2	0	0	0	4.9	2.7	17.0	7.1	3.3	3.9	1.6	1.9	5.1	18.3	
Monthly wages	16.7	28.6	23.3	17.5	14.8	48.7	13.2	7.1	10	13.7	8.2	1.9	10.2	10.0	
Lifetime injection drug use															
Heroin	97.9	100	68.3	54.0	65.6	89.2	1.9	30	56.7	58.8	100	98.2	55.0	95.0	
Buprenorphine	18.8	14.3	0	1.6	0	35.1	75.5	42.9	83.3	76.5	4.9	9.3	95.0	98.3	
Other pharmaceutical drugs	37.5	50.8	73.3	98.4	62.3	27.0	84.9	57.1	83.3	88.2	62.3	64.8	80.0	91.7	
Cocaine	2.1	0	3.3	0	13.1	75.7	28.3	15.7	1.7	2.0	1.6	7.4	0	0	
Methamphetamine	0	0	0	0	11.5	27.0	1.9	5.7	0	0	1.6	3.7	0	3.3	

a. Characteristics of participants by study site¹ (n=801)

	ESTABLISHED EPIDEMICS					EMERGING EPIDEMICS					LARGE CITIES					
	Northeast			South		West		North			South		West		East	
	AS	MP	MZ	NG	AP	GA	HY	PB	RJ	UP	TN	MH	ND	WB		
Injection frequency ²																
None	0	30.2	60.0	52.4	45.9	13.5	1.9	4.3	3.3	9.8	100	20.4	3.3	13.3		
< daily	35.4	44.4	28.3	47.6	54.1	73.0	15.1	81.4	25.0	37.2	0	29.6	18.3	0		
daily	64.6	25.4	11.7	0	0	13.5	43.4	14.3	71.7	52.9	0	50	78.3	86.7		
Drugs injected ^{2,3}																
Heroin	97.9	100	87.5	38.7	54.6	78.9	3.9	29.9	51.7	72.0	-	100	47.5	100		
Buprenorphine	27.1	0	4.2	3.2	3.0	39.4	86.5	43.3	81.0	70.0	-	48.8	93.2	75.0		
Other pharmaceutical drugs	52.1	9.1	54.2	83.9	66.7	36.4	94.2	62.7	93.1	82.0	-	67.4	96.6	96.2		
Cocaine	2.1	0	0	0	0	42.4	26.9	23.9	0	18.0	-	0	0	0		
Methamphetamine	0	0	0	0	6.1	30.3	3.9	14.9	0	2.0	-	14.0	0	5.8		
Drugs used (non-injection) ²																
Heroin	2.1	0	6.7	47.6	14.8	40.5	62.3	65.7	75.0	68.6	0	92.6	73.3	100		
Other pharmaceutical drugs	100	42.9	31.7	85.7	26.2	73.0	71.7	87.1	81.7	64.7	0	81.5	91.4	93.3		
Cocaine/crack	0	0	0	0	4.9	32.4	26.4	22.9	1.7	0	0	3.7	0	11.7		
Amphetamines	0	0	0	0	8.2	13.5	0	21.4	0	2.0	0	14.8	0	33.3		
Marijuana	81.3	25.4	13.3	6.4	19.7	43.2	71.7	42.9	86.7	74.5	70.5	59.3	88.3	95.0		
Alcohol use ⁴																
Never	0	47.6	8.3	1.6	18.0	24.3	15.1	7.1	41.7	15.7	9.8	51.0	26.7	26.7		
Light use	77.1	33.3	45.0	57.1	31.2	16.2	32.1	61.4	45.0	66.7	16.4	47.1	66.7	56.7		
Heavy use	22.9	19.1	46.7	41.3	50.8	59.5	52.8	31.4	13.3	17.7	73.8	2.0	6.7	16.7		
Median number of drinks	2	4	3	3	3	3	4	3	3	3	3	3	3	3		
IQR	2.3	2.6	2.5	3.4	3.6	2.3	3.4	3.4	3.5	3.5	3.6	3.3	3.4	2.5		
Needle sharing ^{2,3}	68.8	61.4	50.0	35.5	33.3	75.8	78.9	54.7	62.1	64.0	-	51.2	62.7	44.2		
Any sexual intercourse ²	60.4	55.6	58.3	100	82.0	91.9	54.7	71.4	41.7	56.9	37.7	70.4	35.0	66.7		
Sex with a casual partner ²	14.6	11.1	15.0	34.9	55.7	75.7	52.8	35.7	30.0	33.3	4.9	53.7	28.3	11.7		
Men having sex with men ²	4.2	3.2	2.1	4.9	36.4	61.9	1.9	41.4	12.1	7.8	1.7	9.8	10.0	3.6		

b. Comparison of persons who reported injecting stimulants (cocaine and/or methamphetamine) in the prior six months and those who reported injecting only opiates or other pharmaceutical drugs (n=592)^f

	Any stimulant injection in prior 6 months		Opiate and/or pharmaceutical drug injection only in prior 6 months		P value
	N	%	N	%	
	82		510		
Median age, IQR	29	25, 34	33	28, 38	<0.0001
Gender					
Male	74	90.2	458	89.8	0.08
Female	6	7.3	50	9.8	
Hijrah	2	2.4	2	0.4	
Married	30	36.6	207	40.6	0.48
Education					
None	25	30.5	139	27.3	.05
Primary school	17	20.7	180	35.3	
Secondary school	18	22.0	95	18.6	
High school or more	22	26.8	96	18.8	
Employment					
Unemployed	12	14.6	179	35.2	<0.0001
Daily wages	35	42.7	250	49.1	
Weekly wages	14	17.1	21	4.1	
Monthly wages	21	25.6	59	11.6	
Daily drug injection ²	30	37.0	278	55.1	<0.01
Drugs injected ²					
Heroin	41	50.0	338	66.0	<0.01
Buprenorphine	38	46.3	260	51.2	0.41
Other pharmaceutical drugs	53	64.6	369	72.4	0.14
Cocaine	54	65.9	--	--	--
Amphetamine	34	41.5	--	--	--
Drugs used (non-injection) ²					
Heroin	59	72.0	275	53.9	<0.01

b. Comparison of persons who reported injecting stimulants (cocaine and/or methamphetamine) in the prior six months and those who reported injecting only opiates or other pharmaceutical drugs (n=592)^f

	Any stimulant injection in prior 6 months		Opiate and/or pharmaceutical drug injection only in prior 6 months		P value
	N	%	N	%	
	82		510		
Crack/cocaine	27	32.9	24	4.7	<0.0001
Amphetamines	16	19.5	35	6.9	<0.0001
Needle sharing ²	58	70.7	289	56.7	0.02
Median needle sharing partners ² , IQR	2	2, 4	3	2, 6	<0.01
Alcohol use ³					
None	13	15.9	120	23.5	<0.001
Light	30	36.6	271	53.0	
Heavy	39	47.6	120	23.5	
Median number of drinks, IQR	4	3, 4	3	2, 4	0.02
Any sexual intercourse ²	70	85.4	294	57.7	<0.0001
Sex with a casual partner ²	47	57.3	157	30.8	<0.0001
Men having sex with men ²	25	32.9	43	9.4	<0.0001
Drug preference					
Heroin/Buprenorphine/Pharmaceutical	47	59	491	98	<0.0001
Stimulant (Cocaine/Methamphetamine)	33	41	10	2	
Ease of heroin availability					
Not available easily	39	47.6	27	25	<0.0001
Variable availability	25	30.5	146	28.6	
Easily available	18	22.0	236	46.4	
Cost of one heroin injection (Indian Rupees)	100	70, 200	500	100, 1500	<0.001
Interquartile range (IQR)					

^f Study sites: Established Epidemics: Guwahati, Assam (AS); Imphal, Manipur (MP); Aizawl, Mizoram (MZ); and Dimapur, Nagaland (NG). Emerging Epidemics: Ananthapur, Andhra Pradesh (AP); Panaji, Goa (GA); Faridabad, Haryana (HY); Amritsar, Punjab (PB); Jaipur, Rajasthan (RJ); Ghaziabad, Uttar Pradesh (UP). Large Cities: Chennai, Tamil Nadu (TN); Mumbai, Maharashtra (MH); New Delhi (ND); Kolkata, West Bengal (WB).

² Reflect characteristics in the prior 6 months

³ Denominator only includes persons who reported injecting in the prior 6 months

⁴ Light alcohol use = <3 days per week; heavy alcohol use = 3 days per week

Interquartile range (IQR)

¹ Analysis includes only persons who reported any drug injection in the prior 6 months; Mann Whitney tests were used to compare continuous variables and chi-squared tests to compare categorical variables; p values corrected for clustering within survey sites

² Reflect characteristics in the prior 6 months

³ Light alcohol use = <3 days per week; heavy alcohol use = 3 days per week