



## Research paper

# Criminal justice involvement of crack cocaine users in the city of Rio de Janeiro and Greater Metropolitan Area: Implications for public health and the public security agenda



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## ABSTRACT

**Background:** The international literature has expressed different and sometimes contrasting perspectives when addressing criminal involvement by crack cocaine users, highlighting psychopharmacological aspects, the cycles of craving and pressing economic need, and the interplay with overall deprivation and structural violence. The current study aims to identify variables associated with the arrest and imprisonment of regular crack cocaine users.

**Methods:** Interviewees were recruited from open drug scenes in the city of Rio de Janeiro and Greater Metropolitan Area from September 2011 to June 2013. Multilevel logistic regression models were fitted to the data.

**Results:** Most of the recruited crack cocaine users were male (78.2% [95%CI: 76.3–79.4]), 18–30 years old (64.7% [95%CI: 62.5–66.2]), non-white (92.9% [95%CI: 91.2–93.4]), single (68.9% [95%CI: 66.8–70.3]), and with 0–7 years of schooling (70.6% [95%CI: 68.5–71.9]). Factors independently associated with arrest were history of inpatient addiction treatment (adjOR 4.31 [95%CI: 1.70–11.32]); male gender (adjOR 2.05 [95%CI: 1.40–3.04]); polydrug use (adjOR 1.82 [95%CI: 1.32–2.51]); and 0 to 7 years of schooling (adjOR 1.64 [95%CI: 1.17–2.32]). As for the outcome variable lifetime history of incarceration, the independently associated factors were: male gender (adjOR 2.47 [95%CI: 1.74–3.55]) and longer use of crack cocaine and related substances (e.g., free base and local varieties/denominations of coca products) (adjOR 1.05 [95%CI: 1.01–1.10]).

**Conclusion:** The study's findings support the use of comprehensive multisector interventions, integrating health promotion and mental health rehabilitation, access to quality education, and management of combined/concomitant use of different substances to reduce and/or prevent criminal involvement by individuals that use crack cocaine and other substances, as well as to prevent/manage relapse.

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## Introduction

The international literature has expressed different and sometimes contrasting perspectives when addressing criminal involvement by crack cocaine users. For instance, the psychopharmacological perspective tends to associate aggressive and violent behavior as a direct consequence of the influence of some substances on individuals' attitudes and behavior. Another complementary perspective emphasizes the short circuits

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experienced by drug users from craving and the pressing need to finance their habit. Moving from the individual and micro-social dimension to the meso- and macro-social contexts and communities, several authors have highlighted the central role of chronic marginalization and deprivation, alongside the structural violence closely associated with drug trafficking (as well as with violent law enforcement). This is usually expressed in the sheer brutality of territorial feuds or drug turf wars between criminal factions (Goldstein, 1985; Toledo, Góngora, & Bastos, 2017; Weiner et al., 2005).

Brazil has recently experienced a nationwide increase in crack cocaine use and trafficking. The association between the (mis)use of crack cocaine and violence and crime, especially in major urban areas (Medeiros, 2014; Roso et al., 2013; Santos et al., 2012), has been highlighted repeatedly by the media and social networks despite the scarcity of sound empirical data to document such a putative association.

A review of media reports on crack cocaine and its associated harms and risks, published in the two leading mainstream newspapers in Recife, Pernambuco State, Northeast Brazil, showed that such reports highlighted both the pronounced anxiety and physical and psychological frailty of users and their purportedly pivotal role in drug trafficking and violent crime. Such social representations supposedly depict hypothetically “average” crack cocaine users as subjects devoid of any evaluative capacity vis-à-vis their own condition, and who are vulnerable but extremely aggressive (Santos et al., 2012).

Mello (2011) reviewed the assumed and actual associations between crack cocaine and violence from a critical perspective, drawing on secondary analysis of data on crimes such as theft, robbery, and homicide (1984–2008) and assessing the so-called “*crack hypothesis*” (i.e. the putative key role of crack cocaine use and trafficking in local criminal dynamics). The author examined whether the emergence of crack cocaine in Greater Metropolitan São Paulo and the rest of the state of São Paulo was associated with an observed increase in these crime rates. Despite some degree of correlation, crack cocaine dealing (but not possession and use) was statistically associated with perpetration of homicide. Meanwhile, no associations were found between trafficking or possession/use and property crime.

Several studies contend that involvement with law enforcement and the criminal justice system is more frequent among crack cocaine users than among users of other illegal drugs. For example, in 2005 in Vancouver, Canada, DeBeck et al. (2007) interviewed 275 injection drug users who also used crack. Their study found frequent use of crack cocaine was more closely associated with illegal activities to obtain cash (OR = 4.6 [95%CI: 2.6–7.2]) than was the misuse of other substances, whose pattern of use is more evenly distributed over time (instead of binges, which prevail in crack cocaine scenes) and less pressing, such as with heroin and other opiates (OR = 2.7 [95%CI: 1.7–4.6]).

The international literature has discussed which factors may explain the observed association between the misuse of some drugs and crime. Some studies have associated criminal conduct with the use of such substances, since their effect can influence perception and behavior, thus increasing the odds of criminal behavior. An alternative explanation emphasizes that crack cocaine users tend to lack sources of formal income and instead engage in illegal practices like petty theft and smuggling or reselling illegal drugs, thus exposing themselves to law enforcement (Burr, 1987; DeBeck et al., 2007; Fischer, Monga, & Manzoni, 2005; Seddon, 2006).

Hall, Bellband, and Carless (1993) highlight the need for a detailed analysis of the contexts and variables potentially associated with criminal involvement by crack cocaine users, as

well as those that could be targeted by public policies to reduce individual and social harms, including incarceration.

There is a scarcity of epidemiological studies on factors associated with criminal involvement by crack cocaine users in Brazil and an in-depth understanding of the dynamic of drugs vis-à-vis violence and crime is crucial for formulating evidence-based interventions. In response, this article aims to identify factors associated with involvement with the criminal justice system by crack cocaine users found in open drug scenes in the city and Greater Metropolitan Area of Rio de Janeiro (September 2011–June 2013).

## Method

### Study design

The study analyses data from the *National Survey on Crack Cocaine Use* (FIOCRUZ, 2014), a representative national population-based survey that used a time–location sampling (TLS) strategy to reach and recruit individuals clustered in previously mapped open drug scenes (Karon & Wejnert, 2012). Once mapped, open drug scenes were stratified in day and shift strata (e.g., Monday mornings versus Saturday evenings) and were randomly selected for subsequent visits, recruitment, and interviewing according to the selected scene, day or shift strata.

The national sample consisted of three sampling strata, namely: all state capitals and the Federal District, selected municipalities from the nine metropolitan areas, and a pool of non-metropolitan large, medium-sized, and small municipalities. The sample for the city of Rio de Janeiro (capital of the state of Rio de Janeiro) was thus selected in two steps: (i) scenes and their respective day/shift strata and (ii) individuals found (and asked to be interviewed) within the latter. Greater Metropolitan Rio de Janeiro included three selection stages: (i) municipalities belonging to this metropolitan area, (ii) scenes/shifts/days from the selected municipalities, and (iii) users belonging to such scenes/shifts/days (a detailed explanation of the sampling strategies is available at FIOCRUZ, 2014).

In Rio de Janeiro city, we visited 107 scenes where we observed and/or recruited individuals that use crack cocaine (note that observation of the scenes did not necessarily lead to immediate interviewing, due to the violent conflicts that can present difficulties for interviewing individuals in a given setting).

In Greater Metropolitan Rio de Janeiro (including Rio's impoverished outskirts), we visited 27 scenes in Duque de Caxias, 8 scenes in Niterói, 11 scenes in São João de Meriti, 10 scenes in Queimados, 6 scenes in Itaguaí, 21 scenes in Belford Roxo, and 8 scenes in Seropédica where there was observation or recruitment of people who use crack cocaine.

The present analysis used part of the national dataset corresponding to the city of Rio de Janeiro and selected municipalities from the Greater Metropolitan Area. Based on the international literature, selected variables consisted of a subset of socio-demographic and behavioral variables, as well as variables on the involvement of crack cocaine users with the criminal justice system.

Crack cocaine users were interviewed from September 2011 to June 2013. The study sample consisted of men and women  $\geq 18$  years of age who had used crack cocaine and/or related substances (e.g., freebase or local varieties/denominations of coca products) on a regular basis (i.e., for at least 25 days in the previous 6 months, according to the CODAR criteria, as defined by the Pan American Health Organization (PAHO), 2017), who were frequenting open crack scenes mapped and selected for the study.

Interviews were conducted in secluded spaces adjacent to the open crack scenes or in health units located close to the scenes. The study sample consisted of 930 crack users (544 from the city of Rio

**Table 1**

Characteristics of users of crack cocaine and related substances and bivariate models for history of arrest and incarceration in the city of Rio de Janeiro and Greater Metropolitan Area, Brazil, September 2011 to June 2013.

	Population Estimates % 95%CI	Bivariate Model for Arrest OR 80%CI	Bivariate Model for Incarceration OR 80%CI
Arrest (Ref. category: No)			
Yes	29.8 (26.6–33.3)	–	–
Incarceration (Ref. No)			
Yes	43.3 (39.9–46.8)	–	–
Gender (Ref. Female)			
Male	78.2 (76.3–79.4)	<b>1.93 (1.52–2.27)</b>	<b>2.46 (1.97–3.08)</b>
Race/skin color (Ref. White)			
Non-White	92.9 (91.2–93.4)	<b>1.45 (1.03–1.82)</b>	1.31 (0.97–1.78)
Age (Ref. ≥31 years)			
18–30 years	64.7 (62.5–66.2)	1.20 (0.97–1.37)	<b>0.70 (0.58–0.85)</b>
Marital status (Ref. Married)			
Single	68.9 (66.8–70.3)	1.15 (0.93–1.30)	0.91 (0.75–1.10)
Divorced	10.7 (9.3–11.7)	1.07 (0.80–1.32)	1.26 (0.96–1.64)
Years of schooling (Ref. ≥8 years)			
0–7 years	70.6 (68.5–71.9)	<b>1.50 (1.21–1.73)</b>	1.05 (0.87–1.28)
Paid work (Ref. Yes)			
No	21.1 (19.2–22.4)	1.21 (0.96–1.42)	0.81 (0.65–1.00)
Income (Ref. >USD 221.80)			
≤ USD 221.80	41.4 (39.0–43.0)	1.09 (0.89–1.25)	<b>0.78 (0.64–0.94)</b>
Source of income (Ref. Legal)			
Illegal	23.0 (21.8–25.2)	1.11 (0.89–1.28)	1.09 (0.89–1.33)
Has lived or spent most nights on the streets (Ref. No)			
Yes	52.1 (49.7–53.8)	1.03 (0.84–1.18)	0.98 (0.82–1.18)
Polydrug user (Ref. No)			
Yes	49.0 (47.3–51.2)	<b>1.79 (1.46–2.04)</b>	<b>1.38 (1.15–1.66)</b>
Duration of crack cocaine and related substance use in years	4.52 (4.37–4.62)	0.98 (0.96–1.00)	<b>1.05 (1.02–1.07)</b>
Participates in Harm Reduction Program (Ref. No)			
Yes	1.53 (0.96–1.98)	1.14 (0.66–1.61)	1.16 (0.70–1.91)
Has received inpatient addiction treatment (Ref. No)			
Yes	1.34 (0.83–1.74)	<b>3.23 (1.78–4.80)</b>	0.73 (0.40–1.32)
Has received psychosocial care for addiction (Ref. No)			
Yes	1.23 (0.74–1.62)	1.55 (0.84–2.31)	1.69 (0.95–3.06)
Has received Social Assistance (Ref. No)			
Yes	12.0 (10.4–13.1)	1.09 (0.84–1.29)	0.89 (0.70–1.14)

Bold variables that were significantly associated with arrest or incarceration in the bivariate model.

de Janeiro and 386 from other municipalities located in Greater Metropolitan Rio de Janeiro).

### Outcomes

Involvement of crack users with the criminal justice system was assessed by two outcomes: history of arrest and history of incarceration. Arrest was defined by the question: “Have you been arrested by the police (staying for less than one day at the police station or precinct jailhouse) in the last year?” (Y/N) and history of incarceration by the question: “Have you ever been incarcerated/imprisoned?” (Y/N)

Chart 1 (*web appendix*) depicts the explanatory variables.

### Statistical analysis

Due to the dataset’s complexity (two and three selection stages for Greater Metropolitan Rio and the city of Rio, respectively), we fitted a multilevel model to the data.

The study assessed the profile of the crack user population who were present in open crack scenes (Table 1). For each estimate and its respective 95% credibility interval, we fitted an appropriate (linear or binary) univariate multilevel model with varying-intercept random effects controlling for the sample design.

Individual associations between covariates and the two outcomes, arrest or incarceration, were independently assessed using a bivariate multilevel model, which incorporated a random effect term. These analyses were used to estimate the adjusted odds

ratios and respective 80% credibility intervals (Table 1). A negative answer for each question (i.e., people reporting they had not been arrested and/or incarcerated) was taken here as the reference category (i.e., AdjOR = 1).

Variables that were significantly associated with arrest or incarceration in the bivariate model (Table 1) were included in the multivariate logistic regression multilevel models. Besides statistically significant associations, the multivariate model included three additional variables which have been widely used in studies on criminal involvement: race/skin color (white/non-white), age (younger vs. older), and history of living in the streets (yes/no) (Best et al., 2001; Cross, Johnson, Davis, & Liberty, 2001; DeBeck et al., 2007; Hall et al., 1993; Instituto Sou da Paz, 2012; Kokkevi et al., 1993; Lemgruber & Fernandes, 2011; Palamar, Davies, Ompad, Cleland, & Weitzman, 2015; Seddon, 2006).

As for arrest as the outcome, the following variables were selected: polydrug user [individuals who, besides crack cocaine, reported the use of at least two additional illegal drugs]<sup>1</sup> (yes/no), having received inpatient addiction treatment (yes/no), years of schooling (cutoff 0–7 vs. ≥8), having lived or spent most nights on

<sup>1</sup> Regular use of alcohol and tobacco was reported by ~95% of the interviewees and was NOT considered for the sake of our analyses as distinguishing individuals categorized as polydrug users from all other users, while the inclusion of users of different illegal substances (and the associated risks and harms) in different drug scenes was key to our decision to categorize polydrug use as we did, besides the very low numbers of people that did NOT use alcohol and tobacco.

the streets (yes/no), gender (male vs. female), age (younger vs. older), and race/skin color.

Meanwhile, with ever having been in jail/prison as the outcome, the following variables were included in the multivariate models: polydrug user, duration of crack cocaine and related substance use in years (number of months using crack cocaine divided by 12), income (using US\$221.80 per month as the cutoff), having lived or spent most nights on the streets, gender, age, and race/skin color.

For each of the two outcomes, a multilevel logistic regression model was fitted to estimate the adjusted odd ratios and respective 95% credibility intervals. The analyses profited from the Bayesian approach (Fong, Rue, & Wakefield, 2010; Rue, Martino, & Chopin, 2009), using weakly informative priors (Gelman et al., 2008), respecting both the fixed regression coefficients and the varying-intercept random effects. The model has two varying-intercept random effects. The first considers the stratum level (city of Rio de Janeiro versus Greater Metropolitan Area) and the second controls for the conglomerate level (scene/day/shift). Due to computational constraints, we assumed that within each of the two strata (city of Rio or Greater Metropolitan Area), the scene/day/shift clusters were equiprobable. For each scene/day/shift cluster, the selection of users can be described with an acceptable degree of plausibility as a simple random sample. The Bayesian inference procedure used the Integrated Nested Laplace Approximations (INLA) method (Rue et al., 2009).

Statistical analyses were performed with the open source software R 3.1.1 (R Core Team, 2014).

#### Ethical aspects

The Institutional Review Board of the Sergio Arouca National School of Public Health, Oswaldo Cruz Foundation, approved the study (CAAE no. 34700914.6.0000.5240).

#### Results

A total of 914 crack users provided valid answers on arrests in the previous year (yes = 303/no = 611) and 897 answered the question on history of imprisonment (yes = 390/no = 507). All those who refused to answer, did not know, or provided inconsistent answers (such as people who mentioned imprisonment under the legal age, which is 18 years in Brazil) were excluded for the analyses. Overall, 186 crack cocaine users had been arrested and incarcerated; 115 had been arrested but not incarcerated; 214 had

been incarcerated but not arrested; and 396 stated that they had not been arrested (in the previous 6 months) or incarcerated (ever).

In the city of Rio de Janeiro and Greater Metropolitan Area, 29.8% (95%CI: 26.6–33.3) of interviewees had been arrested and 43.3% (95%CI: 39.9–46.8) had been incarcerated. Most crack cocaine users who were recruited from open crack scenes were male (78.2% [95%CI: 76.3–79.4]), aged 18–30 years (64.7% [95%CI: 62.5–66.2]), non-white (mostly African-descendants or equivalent terms) (92.9% [95%CI: 91.2–93.4]), single (68.9% [95%CI: 66.8–70.3]), and with 0–7 years of schooling (70.6% [95%CI: 68.5–71.9]).

A small share of these users reported illegal sources of income (23.0% [95%CI: 21.8–25.2]). Nearly half had monthly income below the minimum wage in Brazil at the time (41.4% [95%CI: 39.0–43.0]) (Table 1).

Most lived or spent most nights on the streets (52.1% [95%CI: 49.7–53.8]), almost half were polydrug users (49% [95%CI: 47.3–51.2]), and the average duration of use of crack cocaine and related substances was 4 years (95%CI: 4.37–4.62) (Table 1).

Only 1.53% of the interviewees (95%CI: 0.96–1.98) had ever attended harm reduction programs, 1.34% (95%CI: 0.83–1.74) had ever received inpatient addiction treatment, and 1.23% (95%CI: 0.74–1.62) had been treated at a Psychosocial Treatment Center for Alcoholism and Other Forms of Substance Misuse (CAPS-AD in the Portuguese acronym) in the previous 30 days.

Although the interviewees attended social services erratically, these services appeared to be more relevant than health services for this group, with 12% (95%CI: 10.4–13.1) having attended social services in the previous 30 days.

Variables independently associated with arrest in the multivariate model were: history of inpatient addiction treatment (adjOR 4.31 [95%CI: 1.70–11.32]), male gender (adjOR 2.05 [95%CI: 1.40–3.04]), polydrug use (adjOR 1.82 [95%CI: 1.32–2.51]), and 0–7 years of schooling (adjOR 1.64 [95%CI: 1.17–2.32]) (Fig. 1).

Variables independently associated with history of incarceration in the multivariate multilevel model were: male gender (adjOR 2.47 [95%CI: 1.74–3.55]) and duration of crack cocaine use (adjOR 1.05 [95%CI: 1.01–1.10]). The association with polydrug use (adjOR 1.30 [95%CI: 0.98–1.74]) showed borderline significance (Fig. 2).

#### Discussion

The city of Rio de Janeiro, and to a lesser extent other cities located in its Greater Metropolitan Area, were deeply affected by

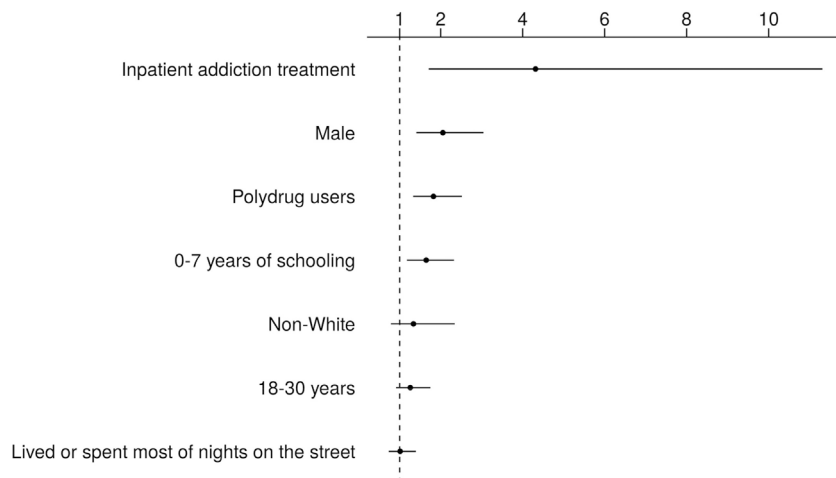
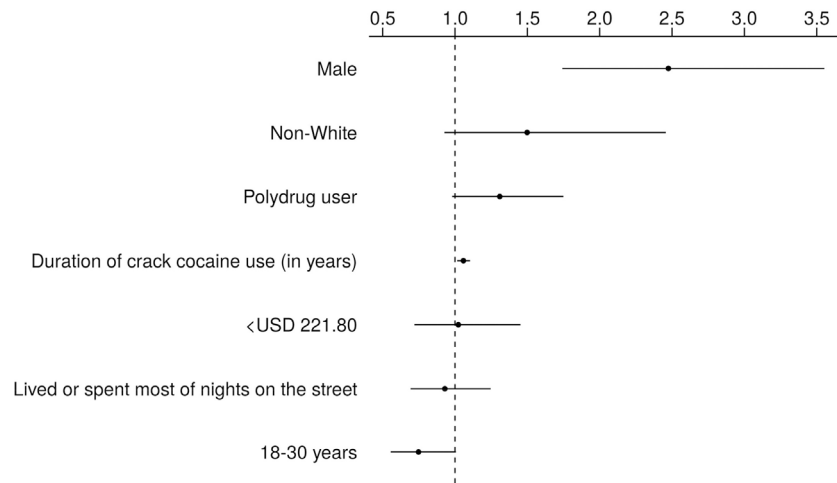


Fig. 1. Adjusted odd ratios from multiple logistic regression model for history of arrest in users of crack cocaine and related substances. Rio de Janeiro and Greater Metropolitan Area, September 2011 to June 2013.



**Fig. 2.** Adjusted odd ratios from multiple logistic regression model for history of incarceration in users of crack cocaine and related substances. Rio de Janeiro and Greater Metropolitan Area, September 2011 to June 2013.

the preparations for the various mega events hosted there between 2008 and 2016 (the visit by Pope Francis during World Youth Day, the FIFA World Cup, and the Summer Olympic Games). In parallel, the boom of open crack scenes emerged in roughly the same period, perhaps due to a combination of actual increases in crack cocaine trafficking and consumption, displacement of entire communities, and higher visibility in a dynamic urban area.

Such booming open crack scenes were seen as a major threat and challenge to urban security and the free circulation of locals and tourists. As a consequence, several successive interventions that aimed to promote “urban order” and sanitize and secure urban spaces were enforced, often with intimidating and aggressive initiatives like mass compulsory hospitalization of crack users. Open crack cocaine scenes were frequently associated with civil unrest and violent crimes, based more on common-sense prejudice than sound empirical evidence. Unfortunately, this did not prevent the media and some researchers and policymakers from proposing the infamous “crack hypothesis”, i.e. the misguided idea that all violence observed in Rio de Janeiro was the exclusive result of the so-called “crack cocaine boom”.

At roughly the same time, drug scenes became the preferred and repeated target of police raids, sometimes conducted with the full apparatus and personnel commonly seen in civil wars, such as in Iraq or Syria (with the massive presence of special forces using military tactics, heavy weapons, and tanks; Bastos, 2014; Macerata et al., 2014).

The National Crack Cocaine Survey (of which this paper represents a local sub-study) was launched and conducted in this context. Several times, our teams, assigned in advance by a random-based computer algorithm to visit a given place/day/shift, encountered open conflicts in different settings and were forced to retreat to protect their lives. These difficulties were partially addressed by successive re-visits to the same places, always aiming to find the best and least dangerous days and times (Bastos, 2014).

According to the findings, most crack users in open scenes in the city of Rio de Janeiro and Greater Metropolitan Area were male, young, and poorly educated. Interestingly, contrary to previous studies, and partly as a natural consequence of the study’s recruiting strategy (from open crack cocaine scenes), half of the users said they spent most of their time on the streets. That is, half of the sample had no routine work or stable housing (Cross et al., 2001; Fischer et al., 2006; Palamar et al., 2015). The study should thus be viewed as targeting the most vulnerable and disenfranchised active crack cocaine users.

The high arrest and incarceration rates contrasted with crack users’ low utilization of health services for substance misuse. The lack of access to and regular use of such services means a lack of essential support for this marginalized group, further reinforcing their exclusion and vulnerability, in a downward spiral of disease, poverty, and involvement in criminal activity.

During the study period, coverage of mental health services in the city of Rio de Janeiro and Greater Metropolitan Area was poor. Rio de Janeiro had 6 million inhabitants in 2010 according to the National Census (2010) and only four Psychosocial Treatment Centers for Alcoholism and Other Forms of Substance Misuse (CAPS-ADs), each with capacity to treat less than one hundred severely ill patients. Programs that aimed to reduce drug-related harm had lost their momentum and were clearly under-budgeted and under-staffed when compared to the relatively favorable conditions in Brazil in the 1980s and early 1990s (Fonseca et al., 2007; Inglez-Dias, Ribeiro, Bastos, & Page, 2014).

The study also showed a clear lack of sync between programs still adopting the harm reduction model that formerly targeted people who injected drugs versus the characteristics and needs of the new cocaine scene, where users basically smoke or snort coca products and seldom inject substances. This dynamic scenario has emerged internationally (Shoptaw et al., 2013) and in Brazil (Bastos & Veloso Filho, 2015), and the classic model fails to adopt alternatives tailored to the real needs of this new “generation” of cocaine users.

#### *The gender dimension of arrest and incarceration*

Male crack users had twice the arrest and incarceration rates when compared to females, corroborating other studies that have shown greater involvement of male users with the criminal justice system (Anglin, Hser, & Booth, 1987; Hser, Anglin, & McGlothlin, 1987).

Such findings probably reflect an overlapping of broad gender roles and specific features of male versus female users in open crack scenes in Brazil. Drug use scenes tend to be located close to or overlapping with drug trafficking hot spots, plagued by structural violence, with pronounced historical gender differences. This is the case in Brazil and most other countries.

According to Dudish and Hatsukami (1996) in a sample of 176 crack cocaine users recruited between 1993 and 1995 in Greater Metropolitan Minneapolis–Saint Paul, Minnesota, male users were involved in violent crimes twice as often as females (RR: 2.11 [95%CI: 1.49–2.99]). Leigey and Bachman (2007), based on

data from a representative sample of 13,986 inmates in the United States prison population in 1986–1988, found that among inmates that reported using crack/powder cocaine before committing crimes, men were twice as likely to be arrested for violent crimes (OR: 1.73; p-value 0.001) when compared to women.

#### *Polydrug/longtime users*

Polydrug users (i.e. those categorized for this paper as reporting the use of crack cocaine plus two other illegal substances) had 1.82 times higher odds (95%CI: 1.32–2.51) of being arrested than those reporting exclusive use of crack cocaine and those who used crack cocaine plus only one additional illegal drug. Each additional year using crack cocaine and related substances was associated with, on average, 5% greater odds of incarceration. The gradient is consistent in terms of higher incarceration rates for long-term users, since “increased exposure” is deeply entangled with long-term use and aging.

One can hypothesize that the combined or simultaneous use of different substances for long periods of time characterizes an especially vulnerable segment of heavy, persistent users at increased risk of arrest and/or incarceration. These findings corroborate previous studies highlighting the multiple drug habit as a key predictor of involvement with criminal justice (Bennett & Holloway, 2005; Boreham et al., 2007; Hayhurst et al., 2013; Kokkevi et al., 1993), most likely due to a combination of: (i) participation by this segment of users in multiple contexts of drug consumption and/or dealing; (ii) the overlapping and often synergistic effect of multiple substances on the severity of addiction and intense craving; and (iii) intense stigmatization and marginalization.

#### *The complex interrelationship between justice and health*

History of inpatient addiction treatment was independently and strongly associated with history of arrest (adjOR 4.37 [95%CI: 1.71–11.6]). Users who had received rehabilitation treatment in a specialized service with inpatient capacity were 4 times more likely to be arrested than users who had not received such treatment. The association is difficult to explain, especially because reverse causality cannot be ruled out in cross-sectional studies. Likewise, unmeasurable psychosocial variables may explain both events, ranging from more frequent hospitalization and arrest of a subgroup of heavy drug users to what we could use as an unmeasured but likely high proportion of treatment failure (unfortunately the norm in such very short-stay treatment options).

Given the scarcity of treatment facility beds vis-à-vis growing demand, one can hypothesize that a subgroup of users who suffer the negative consequences of persistent, intense crack use have been hospitalized intermittently (having experienced successive failures/relapses), have been present more often in drug scenes, and may have been involved more frequently in criminal activities to finance an expensive habit. Inpatient addiction treatment could thus be considered a marker of misuse and addiction, probably aggravated by poor performance of the available services.

Another line of reasoning considers the relevance of court-ordered hospitalizations, sometimes known as “therapeutic justice”. Although the Brazilian system is not strictly comparable to the American, which is much more comprehensive and active (Prendergast & Cartier, 2013), therapeutic justice does exist in Brazil, frequently under fuzzy denominations such as “therapeutic legal advice”. According to a report by the Institute for Applied Economic Research, a major Brazilian government think tank (IPEA, 2015), some judges were already referring individuals for treatment long before this federal legal provision was enacted,

under the label of “alternative sentences”. Some legal institutions have provided such care on their own premises or have established formal referral routines to specialized services, some equipped with beds (especially for short periods).

#### *Low educational level*

Users of crack cocaine and related substances with limited schooling (defined here as 0–7 years of formal education) were 1.69 times more likely to be arrested than users who had completed 8 or more years of school. Several international studies have shown an association between low education, criminal involvement, and substance misuse. In the United States, a household survey in 2001–2012 with a sample of 43,093 individuals aged 18 years or older from 50 States and the District of Columbia, found individuals who reported crack use were more likely to have completed fewer years of schooling (OR 2.24 [95%CI: 1.40–3.58]) when compared to those who reported powder cocaine use (Vaughn, Fu, Perron, Bohnert, & Howard, 2010). Several studies have also documented an association between school drop-out and criminal involvement, especially among young offenders. Berridge, Brodie, Pitts, Porteous, and Tarling (2001) analyzed the educational level and criminal records of 343 young people aged 14–16 years who had dropped out of school in England and Wales in 1988–1998: 65% had been convicted of crimes sometime in life.

#### *Study limitations*

Field work carried out in contexts where extreme violence is pervasive constitutes a big challenge. Notwithstanding, first-hand information is essential to better understand these contexts and foster evidence-based policies. Unfortunately, such studies always face limitations. Some designs and procedures that may seem optimal strategies in other settings can be severely hindered or made impossible by threats and risks imposed on both research teams and interviewees.

Drug scenes change over time in both their composition (different user profiles within given scenes) and structure. Structure is defined here as an expression of the differential probability of being arrested or incarcerated according to the scenes’ structural characteristics, e.g., located in or near areas with a major flow of people, or on the “asphalt” (a synonym in Brazil for middle or upper-class neighborhoods or the formal city, as opposed to remote alleys, located in slums), which may in turn be subject to more or less frequent police raids or regular police surveillance.

Since crack users are a highly mobile group, circulating between and within dynamic scenes, there is no guarantee that users arrested in one area or another have been present in these same scenes, days, and/or shifts from which they were recruited and interviewed. This is an unavoidable limitation which means it did not address the contextual dimensions of public security, modeled in this study merely as a loosely defined “second [contextual] level”.

In addition, our analyses were based on “emic” categories rather than on official definitions of arrest and incarceration, i.e., the way people report the events, which may distort or under/over-report actual events (unfortunately, the effort to double-check this information with actual police records invariably backfires via corrupt cops, compromising the protection of personal information and threatening people working in the field). People generally tend to underreport socially undesirable behaviors and events (Tourangeau & Yan, 2007), but this may not apply specifically to crack users in the settings analyzed here.

Importantly, arrest and incarceration are always an interactive process, with two components: (1) an individual police officer or group of law enforcement agents who track and record potential criminal activities and (2) those who commit or are suspected of committing crimes (putative transgressors). Our data refer only to the interviewees who, hypothetically, may have committed the crime or offense that motivated the arrest or imprisonment. Of course, law enforcement and the justice system wield discretionary power over who can be arrested or imprisoned, and their decisions may or may not be fair (i.e., the punishment may or may not be consistent with the crimes or offenses).

As discussed above, context matters. Similar events can be perceived, reported, and enforced differently, depending on where the event occurred, e.g., whether a person was seen using crack in an affluent neighborhood or in a slum.

Causal circularity cannot be disentangled here: past arrests or incarceration can compromise possibilities for employment and resumption of regular family and social life, thus increasing the likelihood of new arrests and incarceration and shaping a “career” of progressive marginalization, stigmatization, and crime.

Studies have shown that the police, judges, and other operators of criminal justice practice criminal selectivity, usually focusing on a specific offender profile, featuring as punishable certain a priori characteristics, behaviors, attitudes, or insertion in specific contexts, as discussed in Boiteux’s work on criminal sentencing in Rio de Janeiro and Brasilia (Boiteux, 2009).

Crack use itself can be part of this downward spiral of marginalization, stigmatization, social exclusion, and impoverishment and can precede (rather than follow) the beginning of a long and complex “criminal career”.

## Final remarks

This article aimed to better understand variables associated with arrest and imprisonment of users of crack cocaine and similar substances, who were found, recruited, and interviewed in open drug scenes in the city of Rio de Janeiro and Greater Metropolitan Area. Combining creative sampling strategies and modeling strategies, we aimed to minimize the several barriers to access a highly mobile and deeply scared population, trapped between the conflicts between factions, paramilitary squads, and police forces that have resorted to executions and mass imprisonment.

It is not possible to distinguish the degree to which reports on criminal justice correspond to the greater or lesser involvement of interviewees in crime and other misdemeanors and offenses, since variables can be associated with an increased visibility of a subset of people who use substances in open scenes. Several reports and papers have repeatedly shown that law enforcement is far from a fair and purely rational and balanced application of sanctions vis-à-vis actual violations. There is no apparent reason to suggest that the unfair treatment of minorities or the “profiling” of scapegoats is different in Brazil compared to other societies and countries. Racism, sexism, and other forms of injustice and stigmatization may have a local dimension, but are unfortunately a global phenomenon. The main difference between Brazil and other societies is the sheer size of its prison population, the inhumane conditions, and the overall inefficiency of the Brazilian judicial system, as repeatedly highlighted by the domestic and international press (see <https://www.amnesty.org/en/countries/americas/brazil/report-brazil/>). Injustice, inadequate provision of care, and food insecurity thrive in the context of institutionalized violence.

In parallel with initiatives to reform Brazil’s prisons and related institutions, all efforts should be made to avoid a growing number of people from being imprisoned in an already overcrowded

system. Programs to reduce open crack scene-related harms and risks must urgently be redesigned and expanded, in sync with users’ new demands and needs, moving beyond classic initiatives that no longer work with this new group of people where injecting is extremely rare. Needle-exchange programs have not been useful for a fast-declining population of injectors, and no substitution maintenance therapy is available in a context where heroin is virtually absent. In this sense, classic programs aiming to reduce drug-related harm are virtually useless in the current Brazilian context.

Broader social interventions to increase access to quality schooling with programs tailored to the cultural milieu of marginalized youth and respect for their cultural and ethnic diversity are essential for mitigating the consequences of racism and discrimination, as well as the high school dropout rates.

Criminal code reform, drug policy reform, and amelioration of the unacceptable conditions prevailing in Brazilian prisons are long-term goals that require serious political commitment, decent budgets, and proper management and accountability, all of which are hard to find in Brazil’s deep and protracted political and economic crisis. Only the concerted efforts of civil society, community and religious leaders, committed health professionals, and a more humane and pragmatic enforcement of drug legislation can help ameliorate the unacceptable conditions of inhabitants of communities frightened by permanent violence. It is crucial to identify alternatives to the vicious cycle of escalating violence, homicides, and mass imprisonment.

## Conflict of interest

The authors declare no conflict of interest.

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## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.drugpo.2017.07.034>.

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