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Research paper

The impact of harm reduction programs and police interventions on the number of syringes collected from public spaces. A time series analysis in Barcelona, 2004–2014

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ABSTRACT

Background: To estimate the effect of opening two services for people who use drugs and three police interventions on the number of discarded syringes collected from public spaces in Barcelona between 2004 and 2014.
Methods: We conducted an interrupted time-series analysis of the monthly number of syringes collected from public spaces during this period. The dependent variable was the number of syringes collected per month. The main independent variables were month and five dummy variables (the opening of two facilities with safe consumption rooms, and three police interventions). To examine which interventions affected the number of syringes collected, we performed an interrupted time-series analysis using a quasi-Poisson regression model, obtaining relative risks (RR) and 95% confidence intervals (CIs).
Results: The number of syringes collected per month in Barcelona decreased from 13,800 in 2004 to 1655 in 2014 after several interventions. For example, following the closure of an open drug scene in District A of the city, we observed a decreasing trend in the number of syringes collected [RR = 0.88 (95% CI: 0.82–0.95)], but an increasing trend in the remaining districts [RR = 1.11 (95% CI: 1.05–1.17) and 1.08 (95% CI: 0.99–1.18) for districts B and C, respectively]. Following the opening of a harm reduction facility in District C, we observed an initial increase in the number collected in this district [RR = 2.72 (95% CI: 1.57–4.71)] and stabilization of the trend thereafter [RR = 0.97 (95% CI: 0.91–1.03)].
Conclusion: The overall number of discarded syringes collected from public spaces has decreased consistently in parallel with a combination of police interventions and the opening of harm reduction facilities.

Introduction

Many people who inject drugs (PWID) do so in public spaces near where they obtained the substance (65% report having done so during the previous year) (de la Fuente et al., 2006), and some abandon injection material nearby. Discarded syringes reflect recent drug use and are often found in streets, squares or parks in the vicinity of drug markets. The presence of syringes can cause public alarm and fear of infection. The main objectives of harm reduction services, including supervised drug consumption facilities, are to prevent blood-borne infections and overdose mortality, as well as other social and health problems. Moreover, by reducing injection in public spaces, they may also reduce the number of discarded syringes in public settings. While harm reduction programs are known to be effective in reducing health risks among people who use drugs (PWUD), the impact of supervised drug consumption facilities on the number of discarded syringes has not been evaluated (Emmanuelli & Desenclos, 2005; Rhodes & Hedrich, 2010; Strang et al., 2012). This is an important issue, as harm reduction services and facilities are often criticized because people living nearby perceive that they attract drug dealing and drug use, which threatens the centres' sustainability. Discarded syringes in public spaces also pose a risk of infection transmission

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(Canadian Paediatric Society, 2008; Escobar et al., 2013; García-Algar & Vall, 1997; Zamora et al., 1998), and are a very intuitive indicator of the nuisance caused by drug dealing and drug use to citizens who do not use drugs (Babor et al., 2009).

Like other cities in southern Europe, Barcelona is a compact city with a high population density. During the 1990s, a sizable proportion of opiate and cocaine dealing was concentrated in Can Tunis, an open scene separated from the urban grid by the port. The expansion of the port led to its demolition in 2004, displacing its last residents (about 100 persons in 20 family units) to other parts of the metropolitan area. Consequently, drug trafficking returned to several areas of the city, especially to the Old City district, accompanied by a rise in the amount of visible discarded injecting material in public spaces (Illundain, 2006). The collection of syringes from the public space had always been performed by the municipal litter collection services, and reinforced for many years in some areas of the Old City by a syringe collection project involving community workers (Bechich et al., 2001). This project was then expanded to incorporate systematic counting of collected syringes by all parties involved, evolving into a comprehensive program to deal with discarded syringes. Police operations to reduce the supply of drugs were also undertaken (unlike in other countries, drug use or the possession of small amounts for personal use has not been a crime in Spain since the 1970s). At the same time, a strategy was developed by the public health service to expand their outreach and treatment activities for PWUD, including harm reduction programs (Rhodes & Hedrich, 2010). The opening of a supervised drug consumption facility in the Old City was a major component of this strategy. However it had to deal with resistance from local residents, which was fuelled by some media and other organisations (Sepúlveda, Báez, & Montenegro, 2008). Following a decline in incidence (Sanchez-Niubo et al., 2007; Sanchez-Niubo, Domingo-Salvany, Melis, Brugal, & Scalia-Tomba, 2007), the size of the city's heroin-using population has been relatively stable over the last decade (Brugal, Guitart, & Espelt, 2013), although there is still a high proportion of injection and frequent consumption in public spaces (de la Fuente et al., 2005).

The objective of this study was to estimate the effect of opening two facilities providing services to PWUD and of three police interventions on the number of syringes collected from public spaces in Barcelona between 2004 and 2014, and trends therein. Our specific aims were to describe the number of syringes collected in the city and in six specific areas over a 10 year period, and to study the impact of five specific events on these numbers: the opening of two facilities providing services to PWUD (one focusing on harm reduction), and three major police interventions.

Methods

Design

We analysed data using an interrupted time-series design (López, Marí-Dell'Olmo, Pérez-Giménez, & Nebot, 2011). We analysed the number of syringes that were collected from public spaces, as reported by community health workers from the Barcelona Public Health Agency (ASPB), the municipal institute for parks and gardens, and the city cleaning services. All these organizations report this information every month to the ASPB's integrated information system. This system has compiled information on syringes collected from public spaces (streets, parks or public gardens) in several districts of Barcelona since 2004, although the syringe collection system existed before this time. For this study, we included a special analysis for five of Barcelona's 10 administrative districts (labelled Districts A to E for the purposes of this study), where the quantity of discarded syringes in public spaces is considered problematic. The remaining five districts were excluded from the analysis as they accounted for <1% of the total number of syringes collected in the city during 2014, a similar percentage to that between 2004 and 2014. In these five districts, less than two syringes per month were collected, which makes this issue much less relevant for public health and makes any thorough statistical analysis difficult. The districts included are mapped in Fig. 1 and include 824,637 citizens (52% of the entire city).

Variables

The dependent variable in this study was the number of syringes collected from public spaces, as reported to the ASPB (Vecino et al., 2013). This information had been collected for districts A, B and E since 2004 and for districts C and D since 2007. The main independent variables were the events or interventions that may have influenced drug traffic and use in the city, as discussed in the Board of the Action Plan on Drugs (Brugal et al., 2013), as follows:

- *Urban change, Intervention 1*: The Can Tunis social housing project in district A was demolished in summer 2004 and its residents were relocated to other parts of the metropolitan area, either within the city or in neighbouring towns. For many years, a very high proportion of all drug dealing in Barcelona was concentrated in this enclave.
- *Services for PWUD, Intervention 2*: A safe consumption facility was opened in district B in December 2004, and other treatment and harm reduction services already operating in the district for PWUD were expanded.
- *Police operation, Intervention 3*: A major police operation took place in district E between November 2005 and February 2006.
- *Police operation, Intervention 4*: A major police operation took place in district A in the summer of 2008, beginning in June.
- *Services for PWUD, Intervention 5*: A new addiction treatment facility opened in district C in December 2010.
- *Police operation, Intervention 6*: A police intervention in December 2011 resulted in the arrest of one of the main drug dealing networks in district D.

The three police operations considered in this study were major interventions, involving months of investigation. Police, with judicial permission, broke into several private residences that were suspected of being the base for drug trafficking and were targeted in order to disrupt the core of local traffic networks and to remove or greatly reduce the extent of drug dealing in the area. The two interventions labelled as harm reduction and treatment had a health focus. The major harm reduction facility in the Old City provides low-threshold substitution therapy, and is a gateway to enter formal treatment. The treatment facility (similar to most of the other ASPB centres) provides opioid substitution therapy, syringe exchange services, and a space for safe consumption (which began after some months of operation).

Some other independent variables were taken into account to ensure that the association between the intervention and the number of syringes collected did not depend on trends in these indicators. These variables were: (a) the monthly number of overdose deaths in Barcelona between 2004 and 2014, obtained from the register of the Legal Medicine Institute; (b) the monthly number of outpatients enrolled in treatment for opioid use disorder between 2004 and 2014; and (c) the monthly percentage (2004–2014) of distributed syringes that were not returned to the exchange programs. Regarding outpatients enrolled in treatment, we included all treatment admissions for opioid use disorder (American Psychiatric Association, 2013, p. 5) at public outpatient