



## Research paper

# Fatal and non-fatal overdose after narcology hospital discharge among Russians living with HIV/AIDS who inject drugs<sup>☆</sup>



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## ABSTRACT

**Objectives:** Among Russians living with HIV/AIDS who inject drugs, we examined the incidence of fatal and non-fatal overdoses following discharge from a narcology hospital and the associations with more advanced HIV infection.

**Design:** Prospective cohort study of data collected at baseline, 3 and 6 months from HIV-infected patients with a history of injection drug use who were not treated with anti-retroviral therapy. Participants were recruited between 2012–2014 from a narcology (addiction) hospital in St. Petersburg, Russia.

**Methods:** Fatal overdose was determined based on contact reports to study staff in the year after discharge. Non-fatal overdose was self-reported at the 3- and 6-month assessments. The main independent variable for HIV severity was CD4 cell count at the baseline interview ( $<200$  cells/mm<sup>3</sup>  $\geq 200$  cells/mm<sup>3</sup>). Secondary analyses assessed time since HIV diagnosis and treated with anti-retroviral treatment (ART) prior to enrolment as independent variables. We fit Cox proportional hazards models to assess whether HIV severity is associated with either fatal or non-fatal overdose.

**Results:** Among 349 narcology patients, 18 participants died from overdose within one year after discharge (8.7%, 95% CI 3.4–14.2 by Kaplan–Meier); an estimated 51% [95% CI 34–68%] reported at least one non-fatal overdose within 6 months of discharge. HIV severity, time since HIV diagnosis and ever ART were not significantly associated with either fatal or non-fatal overdose events.

**Conclusion:** Fatal and non-fatal overdose are common among Russians living with HIV/AIDS who inject drugs after narcology hospital discharge. Overdose prevention interventions are urgently warranted among Russian narcology patients with HIV infection.

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## Introduction

In Russia, there are an estimated 1.8 million people who inject drugs (PWID)—a prevalence of 1.8% of the adult population, which ranks only behind Azerbaijan, Georgia, and Mauritius in prevalence worldwide (Mathers et al., 2008). Among Russian PWID, 37% are HIV-infected. Russia has more HIV-infected PWID than any other country (Mathers et al., 2008). Along with a high prevalence of HIV and PWID, Russians have no access to opioid agonist treatment, low and worsening access to clean syringes and low access to

anti-retroviral treatment (ART) (Degenhardt et al., 2014; Mathers et al., 2010). The incidence of fatal overdose among Russians who use drugs has been estimated at greater than 2 per 100 person-years (Coffin, 2008; Grau et al., 2009), whereas a meta-analysis of studies among PWIDs in other countries has found an overall overdose death rate of 0.62 per 100 person-years, with studies ranging from 0.12 to 4.71 deaths per 100 person-years (Evans et al., 2012; Mathers et al., 2013).

PWIDs living with HIV/AIDS have twice the risk for overdose as those who are not HIV-infected (Green, McGowan, Yokell, Pouget, & Rich, 2012; Mathers et al., 2013). In a previous study of Russians with HIV infection and injection drug use primarily recruited from an inpatient hospital medical service, over three quarters (76%) reported a history of non-fatal overdose in their lifetime with 16% reporting non-fatal overdose in the past 3 months. Those with higher injection frequency and receiving ART were more likely to overdose (Walley et al., 2014). Similarly, a study of nonfatal overdose among PWIDs with and without HIV infection in Vancouver did not show differences in non-fatal overdoses by HIV status or HIV severity (Escudero et al., 2016). It is not clear why people living with HIV/AIDS have a higher risk of fatal overdose than people without HIV. Considerations include co-morbid liver dysfunction, pulmonary dysfunction, riskier behaviours, and social isolation (Green et al., 2012).

In Russia, opioid detoxification (detox) is provided by state-supported narcology hospitals, where 40% of patients are HIV-infected (Holt, 2010). Studies of populations in several countries undergoing detox without further treatment have demonstrated relapse rates after detox as high as 90% at 12 months (Davoli et al., 2007; Fischer et al., 2004; Strang et al., 2003). Due to reduced tolerance and the high rate of relapse, detox is associated with markedly elevated rates of overdose and overdose mortality in the months after treatment (Strang et al., 2003). Thus, utilizing detox services carries very real risks for people who use opioids; the vast majority of PWIDs in Russia use opioids.

The objectives of this paper are the following: (i) To assess the probabilities of fatal and non-fatal overdose among discharged narcology patients living with HIV/AIDS infection who inject drugs; and (ii) To evaluate whether more advanced HIV infection is associated with either fatal or non-fatal overdose.

## Methods

### Population and setting

We conducted a prospective, longitudinal cohort study using data from the Linking Infectious and Narcology Care (LINC) study, which was a randomized controlled trial of a strengths-based peer-led case management intervention designed to support and motivate HIV-infected narcology patients who inject drugs in St. Petersburg, Russia to initiate and remain in HIV medical care and ultimately improve their HIV outcomes. From July 2012 through May 2014, 349 narcology patients with HIV infection and a history of injection drug use were recruited into the LINC study. Eligibility criteria included: (1) age 18–70 years; (2) HIV-infected; (3) hospitalized at the narcology hospital; (4) history of injection drug use; (5) available for CD4 count testing; (6) have 2 contacts to assist with follow-up; (7) live within 100 km of St. Petersburg; (8) have a telephone. The following served as exclusion criteria for study enrolment: (1) currently on ART; (2) not fluent in Russian; (3) cognitive impairment precluding informed consent.

Study participants were recruited from the inpatient wards at the City Addiction Hospital in St. Petersburg, Russia, which is a 500-bed hospital that provides detoxification, early stabilization (treatment of co-morbid psychiatric and somatic disorders), and in-patient rehabilitation. Admitted patients have typical stays of

one to three weeks. HIV-infected patients admitted to multiple designated floors at City Addiction Hospital were eligible for screening. HIV status is routinely collected upon admission and noted on the front of the medical chart. Three times a week, a study nurse selected medical charts of HIV-infected patients who had not been previously screened for the LINC study. Patients were screened one to five days after admission to the narcology hospital. Research Assessors (RAs) who were City Addiction Hospital physicians with narcology sub-specialty training (i.e. narcologists) were trained on the research protocol and screened patients. To reduce the chance of therapeutic misconception, which is the misunderstanding by study participants that a study intervention is already proven to help them, only narcologists who were not involved with the patient's medical care could approach the patient to assess study eligibility. Once a patient was identified as being HIV-infected, without evident significant cognitive impairment, not on ART, and not previously approached about the LINC study, then the RA met with the patient in a private place (e.g. hospital room or exam room) to briefly describe the study, conduct the screening, offer study enrolment and document informed consent. Afterwards, the RA administered the baseline assessment and facilitated CD4 testing. The LINC study was approved by the Institutional Review Boards of Boston University Medical Campus and First St. Petersburg Pavlov State Medical University.

### Data collection

Study interviews were conducted face-to-face by trained research staff at baseline at the narcology hospital, at 6 months and 12 months post-enrolment at First St. Petersburg Pavlov State Medical University. In the event of readmission to the narcology hospital, follow-up interviews were occasionally conducted at the City Addiction Hospital. Study staff contacted study participants by telephone at 3 months post-enrolment to ascertain the number of times participants had overdosed since the baseline interview, and then contacted participants or their contacts prior to the 6-month and 12-month assessments to remind them about the assessment appointments.

### Outcomes

The two main outcomes of interest were: (i) time from discharge to fatal overdose and (ii) time to first non-fatal overdose. The occurrence and dates of fatal overdoses were determined by interviewing participant-provided contacts. Time to fatal overdose was censored at the earliest of the following events: death not due to overdose, loss to follow-up (last date participant confirmed to be alive based on communication with either participant or their alternate contact), or study completion date. Nonfatal overdose was self-reported at the 3-month telephone assessment and the 6-month in-person assessment. At the 3-month telephone assessment, non-fatal overdoses were self-reported based on the question: "The following question refers to accidental overdose on drugs or alcohol. I am referring to unintentional overdose, not to suicide attempts that involve overdosing on purpose. An overdose is when you lose consciousness and your breathing stops or is slowed down. How many times have you overdosed since you were discharged from the narcology hospital?" At the 6-month in-person assessment, non-fatal overdoses were assessed using the following: "These next questions refer to accidental overdose on drugs or alcohol. I am referring to unintentional overdose, not to suicide attempts that involve overdosing on purpose. How many times have you overdosed in the past 6 months?" For the 6-month non-fatal overdose reports, we asked the date of the most recent non-fatal overdose. Because we did not specifically collect data on date of first non-fatal overdose, we approximated this variable using the

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