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## Original Research

# Tuberculosis report among injection drug users and their partners in Kazakhstan



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## ABSTRACT

**Objectives:** Tuberculosis (TB) is a major threat to global public health. Kazakhstan has the second highest percentage of multidrug-resistant tuberculosis (MDR-TB) cases among incident tuberculosis cases in the world (WHO 2013). A high burden of MDR-TB suggests TB prevention, control, and treatment programs are failing. This study provides an epidemiologic profile of TB among injection drug users (IDUs), a high-risk and chronically underserved population, in Kazakhstan.

**Study design:** Cross-sectional study.

**Methods:** The authors studied the characteristics and risk environment of IDUs with self-reported previous active TB and their primary sexual partners in Almaty, Kazakhstan. 728 individuals (364 couples) participated in a couple-based study in 2009.

**Results:** 16.75% of participants reported at least one positive TB test (x-ray) in their lifetime. In a multivariable logistic regression adjusting for couple-based sampling, persons with positive TB test were significantly more likely to be older (odds ratio (OR) 7.26, 95% confidence interval (CI): 1.73, 30.43), male (OR 5.53, 95% CI: 2.74, 11.16), have a shorter duration of injection drug use (OR 0.17, 95% CI: 0.04, 0.65), have received high social support from their significant other (OR 2.13, 95% CI: 1.03, 4.40) and more likely (non-significantly) to have been incarcerated (OR 7.03, 95% CI: 0.64, 77.30).

**Conclusions:** Older men with a history of incarceration and recent injection drug use were more likely to have positive TB test in Kazakhstan. Social network support, while potentially positive for many aspects of population health, may increase risk of TB among IDUs in this context. Public health policies that target high-risk populations and their at-risk networks may be necessary to stem the rise of MDR-TB in Central Asia.

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## Introduction

The continued spread of tuberculosis (TB) and development of drug resistance is a threat to global public health.<sup>1</sup> The World Health Organization (WHO) reported an estimated 8.7 million incident cases of TB and 1.4 million deaths in 2011.<sup>1</sup> While global TB incidence rates have largely declined or stabilized in recent years,<sup>1</sup> in regions such as the former Soviet Union, multidrug-resistant TB (MDR-TB) incidence – an indicator of a poorly functioning TB control and care program – has been on the rise.<sup>2</sup> In 2011 Kazakhstan had the second highest percentage of MDR-TB cases among incident TB cases (30.3% compared to 3.7% globally).<sup>1</sup> To effectively oversee the care and treatment of TB patients, the Kazakhstan national tuberculosis treatment program (NTP) operates a network of primary and district level TB clinics and microscopy laboratories at no cost to legal residents.<sup>3</sup> TB diagnosis is standard protocol for annual physical exams, covering 62.3% of adults in 2011.<sup>6</sup> Challenging their public health approach to this high burden of MDR-TB is a limited understanding of the specific mechanisms that are driving local TB and MDR-TB transmission in the region.<sup>2</sup>

Injection drug use (IDU) is a critical driver of TB.<sup>3</sup> Kazakhstan has one of the highest rates of IDU in the world,<sup>4</sup> with some areas reporting over 10% of the population injecting drugs.<sup>4</sup> In the nation's largest city, Almaty, there were an estimated 17,000 IDUs in 2011 out of a population of 1,413,526.<sup>5,6</sup> Unsafe injection practices,<sup>7</sup> duration and other drug use,<sup>3,8</sup> and contextual environmental factors<sup>9,10</sup> have been shown to increase IDUs' negative health outcomes, specifically the risk of hepatitis B<sup>11</sup> and C<sup>12</sup> and HIV/AIDS.<sup>13</sup> Duration<sup>3,14,15</sup> and type of drug use,<sup>8,15,16</sup> age at first injection,<sup>15</sup> recent drug treatment,<sup>17</sup> exposure to TB cases,<sup>18</sup> incarceration,<sup>3,19</sup> food insecurity,<sup>20</sup> and co-infections (mental health disorders<sup>16</sup> and HIV/AIDS<sup>17</sup>) among IDUs have been associated with an increase risk of incident TB.

Specific drivers of TB among IDUs in Kazakhstan are still largely unknown, including TB diagnostic coverage. This study explores the associations between reported TB case status (x-ray) and sociodemographic characteristics, risk environment, and health status among a high-risk population of IDUs and their primary sexual partners in Almaty, Kazakhstan.

## Methods

### Data source

Project Renaissance is a longitudinal couple-based HIV prevention intervention in Almaty, Kazakhstan that took place from 2009 to 2012 and has been described in detail elsewhere.<sup>5</sup> Briefly, 728 individuals (364 couples, 75.36% of those screened) completed the 1.5-h baseline Audio Computer Assisted Self Interview (ACASI) in Russian and biological testing for HIV, hepatitis C (HCV), and other sexually transmitted infections (STIs). Participants were recruited into the study in Almaty City – by former drug user research assistants – from public injection locations and syringe exchange programs. After

screening, potentially eligible participants invited their primary sexual partner to also be screened and join the study, thus forming a study couple. The current study examines cross-sectional data from the baseline interview and biological testing.

### Study population

Eligible couples were: both aged 18 or older; cross-identified as the other's primary sexual partner; in relationship for at least six months; intended to stay in relationship for at least next 12 months; were in a couple where one or both individuals reported a recent (30 days) unprotected intercourse event with a partner; and were in a couple where one or both individuals reported injecting drugs recently (30 days). Couples were not included if: either individual demonstrated diminished mental capacity that would impede informed consent process; either individual reported intimate partner violence perpetrated by study partner within the past year; either individual failed to commit to entire study length; either individual reported pregnancy intentions in coming 18 months; either individual did not speak, read, and/or understand fluent Russian; or if both individuals did not meet all previously described eligibility criteria.

### Study variables

#### Sociodemographics

The authors collected information about participants' socio-demographic characteristics, including gender, age, ethnicity (Kazakh, Russian, or other), and marital status (legally married, common-law marriage, divorced, separated, widowed, or never married). Socio-economic variables included years of education, recent homelessness (having no place to sleep in the past 90 days), and recent poverty (experiencing food insecurity or having insufficient money for food in the past 90 days). Measures of criminal history included a history of incarceration and arrests.

#### Social support

The complete Multidimensional Scale of Perceived Social Support (MSPSS)<sup>21,22</sup> and relevant subscales of family, friends, and significant others measured social support of each participant. The MSPSS has been used with former Soviet Union populations.<sup>23</sup>

#### Current and past drug and alcohol use

The authors used the Risk Behaviour Assessment (RBA) to assess HIV risk behaviours and past drug use and number of days of use in the past 30 days for the following types of drugs: cocaine, heroin, cannabis, sedatives, stimulants, methamphetamines, opiates, alcohol, methadone, and other drugs not taken as prescribed. RBA validity and reliability with IDU populations have been documented in the former Soviet Union.<sup>24</sup> They assessed recent (past 90 days) unsafe injection behaviours, including: adding blood into an injected drug; front-loading, back-loading, drawing blood into the syringe before injecting (vein testing); purchasing and using a heroin injection prepared by someone else; sharing cookers, cotton, rinse water, and other paraphernalia; dividing drug solutions with others

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