



## Review

## Redressing the epidemics of opioid overdose and HIV among people who inject drugs in Central Asia: The need for a syndemic approach



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## ABSTRACT

**Background:** Accumulating evidence suggests that opioid overdose and HIV infection are burgeoning intertwined epidemics among people who inject drugs (PWID) in Central Asia. To date, however, research on overdose and its associations with HIV risks among PWID in Central Asia remains virtually absent. This paper aims to provide a regional overview of the hidden epidemic of overdose and how it is linked to HIV among PWID in Central Asia, using a syndemic framework that is guided by risk environment research. **Methods:** We conducted a comprehensive literature search of peer-reviewed publications and gray literature on opioid overdose and its associations with HIV in five countries of Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan) as well as on policies and programs that address these co-occurring epidemics.

**Results:** Regional data indicate high rates of fatal and non-fatal overdose among PWID. Evidence suggests mortality rates from overdose exceed HIV/AIDS as the leading cause of death among PWID. The syndemic framework suggests multiple macro-level and micro-level environmental risk factors that drive the co-occurring epidemics of HIV and overdose. This framework identifies several interacting biological and behavioral risks that result in additive effects for HIV and overdose.

**Conclusion:** The high rates of overdose and its associations with HIV underscore the need for a syndemic approach that considers overdose on parity with HIV. Such an approach should focus on the biological, behavioral and structural interactions between these epidemics to reduce social suffering, morbidity and mortality among PWID in Central Asia.

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## 1. The neglected epidemic of opioid overdose in Central Asia

The steep rise in HIV among PWID in Central Asia over the past decade has coincided with a dramatic increase in the rates of opioid overdose. Opioid overdose has reached epidemic proportions both in terms of its scope and severity. Recent research suggests that overdose is a leading, if not primary, cause of morbidity and mortality among PWID in the region (see Table 1). To date, however, opioid overdose remains a largely hidden epidemic that does not appear to be on the radar screen of public health and government officials in Central Asia.

The total estimated number of PWID in the five countries of Central Asia is similar or greater in size to the estimated population of PWID in the U.S. (see Table 1). About one-tenth (29,000) is estimated to be infected with HIV (Degenhardt, 2012). Although there remains a dearth of surveillance data on overdose, some evidence suggests alarming rates of overdose in the region. Data reported in Table 1 indicate that between 21% and 24% of the PWID in the region reported experiencing a non-fatal overdose in the past year (Tajikistan Republican AIDS Center (RAC), 2011; Kazakhstan, 2010). A study of 480 PWID in Almaty, Kazakhstan found that overdose was the leading cause of death among this sample over a 12-month follow-up period (2.1%,  $N=11$  deaths) compared to only one AIDS-related death (0.002%; Gilbert et al., 2012). Another study conducted among PWID in Tajikistan, Kyrgyzstan and Kazakhstan found that one-quarter (25.1%) reported witnessing a death of a PWID in the past year. These data are consistent with a 2013 systematic global review of mortality (Mathers et al., 2013) and other recent research which suggests that overdose is the leading cause of mortality among PWID, exceeding AIDS mortality among HIV-positive PWID (Baggett et al., 2013; Degenhardt, 2012; UNODC/WHO, 2013).

The public health response to opioid overdose in Central Asia remains woefully inadequate. Mounting research worldwide indicates that lay administration of naloxone (an opioid antagonist) to reverse overdose is safe, highly effective, and cost-effective (Compton et al., 2013; Coffin and Sullivan, 2013; CDC, 2012). Some small pilot peer-administered naloxone overdose prevention projects in Kazakhstan, Kyrgyzstan and Uzbekistan are under way with promising results, as shown in Table 1 (Primbetova et al., 2012; EHRN, 2012). These pilot projects, however, have yet to be scaled up. Major structural barriers continue to thwart these efforts including interruptions in the supply of naloxone due to low pharmaceutical profits and limited shelf life, failure to register or include naloxone on government purchase lists and lack of knowledge or training on naloxone use by medical professionals (Coffin, 2008; Gilbert et al., 2012).

## 2. Disentangling overdose and HIV epidemics: behavioral and biological linkages

Emerging research suggests multiple biological and behavioral links between overdose and HIV infection. PWID who experience non-fatal overdose are more likely to engage in drug-related and sexual risk behaviors and to test positive for HIV and hepatitis C infections (Coffin et al., July 2012; Gilbert et al., 2012; Green et al., 2012). A recent meta-analysis conducted by Green et al. (2012) found that HIV positive serological status carried a 74% greater risk of mortality from overdose among PWID, most likely as a result of abnormal liver or pulmonary problems and lowered CD4 counts. It is well documented that PWID with lower CD4 counts are at higher risk of transmitting HIV. To date, only one study has examined the associations between HIV and overdose among PWID in Central Asia. In this study of 480 PWID in Almaty, Kazakhstan, experiencing

a non-fatal overdose in the past 6 months was associated with sharing syringes, injecting with multiple partners, having sex under the influence of drugs, and engaging in unprotected sex (Gilbert et al., 2012). Although the behavioral mechanisms linking overdose and HIV risks have yet to be researched, being under the heavy addictive influence of heroin impairs judgment and cognitive capacity of PWID to recognize risks and enact protective behaviors to prevent HIV transmission and overdose (e.g., using condoms, refusing to share drug equipment, testing purity of drugs before injection and avoiding excessive use or mixed use of drugs that increases the likelihood of overdose). Research suggests that integrating naloxone overdose prevention with HIV prevention interventions and harm reduction programs may not only reduce overdose rates (Walley et al., 2013), but also lead to better HIV outcomes, including a reduction in syringe sharing and an increased likelihood of initiating ARV treatment (Green et al., 2012; Coffin et al., 2012). By addressing the primary life-threatening concern of overdose among PWID, HIV services are more likely to build trust with PWID, link PWID to drug treatment, and retain PWID in harm reduction services and HIV care (Curtis and Dasgupta, 2010; Gilbert et al., 2012).

## 3. Rethinking the links between HIV and overdose using a syndemic framework

Syndemic theory provides a useful framework for understanding the social determinants of HIV and other co-occurring problems in vulnerable populations (Talman et al., 2013; Singer et al., 2006; Stall et al., 2003). A syndemic occurs when a concentration of co-occurring epidemics that are linked to common social conditions interact and reinforce each other. Syndemic interactions create additive risks that ultimately give rise to other health and social problems in specific populations (Singer et al., 2006). The conceptual framework shown in Fig. 1 identifies the most salient macro-level and micro-level environmental risk factors associated with both HIV and overdose among PWID in Central Asia (Jolley et al., 2012; Coffin, 2008). This syndemic framework draws on previous risk environment research on HIV (Rhodes et al., 2005; Strathdee et al., 2010; Jolley et al., 2012) and overdose (Green et al., 2009). As shown in Fig. 1, the co-occurring epidemics of HIV and overdose meet criteria of a syndemic, both in terms of their interacting and additive behavioral and biological risks and in terms of their common environmental risk factors.

## 4. The interplay of environmental risk factors fueling the HIV and overdose syndemic

Dramatic social, political and economic transitions, which have transformed Central Asian countries over the past two decades following the Soviet Union collapse, have fueled the syndemic of HIV and overdose (Jolley et al., 2012; Beyrer, 2011). These transitions have resulted in pervasive poverty and widespread unemployment. The lack of employment and educational opportunities has contributed to widespread heroin use among youth. Lack of legal employment options have also pushed PWID into the drug trade and survival sex work, which increase their risks for HIV transmission and overdose (Strathdee et al., 2010). These transitions have also weakened civil society, which has impeded the capacity of NGOs and PWID to advocate for their needs and contributed to the lack of government transparency and accountability in their response to HIV and overdose as well as to the excessive punishment and corrupt policing of PWID. Furthermore, these transitions have led to a collapse of the public health infrastructure and brain drain of medical and scientific expertise needed to counter these epidemics (Jolley et al., 2012). The legacy of Russian style silo-structured health care systems that currently exists in these

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