

THE INTERNATIONAL JOURNAL OF
DRUG
POLICY

United Nations Office on Drugs and Crime
(UNODC) presents

Science Addressing Drugs and HIV:
State of the Art of Harm Reduction

Guest Editors:
Monica Beg, Steffanie A. Strathdee, Michel Kazatchkine

THE INTERNATIONAL JOURNAL OF
DRUG
POLICY

Aims and Scope

The International Journal of Drug Policy provides a forum for the dissemination of current research, reviews, debate, and critical analysis on drug use and drug policy in a global context. It seeks to publish material on the social, political, legal, and health contexts of psychoactive substance use, both licit and illicit. The journal is particularly concerned to explore the effects of drug policy and practice on drug-using behaviour and its health and social consequences. It is the policy of the journal to represent a wide range of material on drug-related matters from around the world.

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Contents

United Nations Office on Drugs and Crime (UNODC) presents Science Addressing Drugs and HIV: State of the Art of Harm Reduction

GUEST EDITORS: MONICA BEG, STEFFANIE A. STRATHDEE, MICHEL KAZATCHKINE

EDITORIAL

State of the art science addressing injecting drug use, HIV and harm reduction **S1–S4**
Monica Beg, Steffanie A. Strathdee, Michel Kazatchkine (Austria, USA, Switzerland)

COMMENTARIES

The cost-effectiveness of harm reduction **S5–S11**
David P. Wilson, Braedon Donald, Andrew J. Shattock, David Wilson, Nicole Fraser-Hurt (Australia, USA)

People who inject drugs in prison: HIV prevalence, transmission and prevention **S12–15**
Kate Dolan, Babak Moazen, Atefeh Noori, Shadi Rahimzadeh, Farshad Farzadfar, Fabienne Hariga (Australia, Iran, Austria)

Women, drugs and HIV **S16–21**
Tasnim Azim, Irene Bontell, Steffanie A. Strathdee (Bangladesh, Sweden, USA)

Prevention, treatment and care of hepatitis C virus infection among people who inject drugs **S22–26**
Philip Bruggmann, Jason Grebely (Switzerland, Australia)

HIV, drugs and the legal environment **S27–32**
Steffanie A. Strathdee, Leo Beletsky, Thomas Kerr (USA, Canada)

Compulsory drug detention centers in East and Southeast Asia **S33–37**
Adeeba Kamarulzaman, John L. McBrayer (Malaysia, USA)

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Editorial

State of the art science addressing injecting drug use, HIV and harm reduction



Unsafe injecting drug use continues to drive the HIV epidemics in many countries around the world. The United Nations Office on Drugs and Crime (UNODC), Joint United Nations Programme on AIDS (UNAIDS), World Health Organization (WHO) and the World Bank estimate that there are 12.7 million (range: 8.9–22.4 million) people who inject drugs (PWID), globally. Among them, 13.1 per cent or 1.7 million people (range: 0.9–4.8 million) are living with HIV, with wide variations between regions and countries. The HIV situation is of particular concern in South-West Asia and in Eastern and South-Eastern Europe and Central Asia, where the prevalence of HIV among PWID is estimated to be between 23 and 29 percent, respectively. While HIV in sub-Saharan Africa is transmitted mainly via unprotected sexual intercourse, HIV transmission through unsafe injecting drug use has now also emerged as a significant concern in East Africa, and has also been reported in several countries in other parts of Africa (UNODC, 2014). In addition, high risk sexual practices linked to the use of stimulant drugs (e.g. amphetamine-type stimulants, cocaine) among key populations – for example, men having sex with men – are also contributing to the spread of HIV in certain parts of the world.

To respond to HIV and associated epidemics among people who inject drugs, WHO, UNODC and UNAIDS have jointly recommended a package of nine interventions, commonly referred to as a 'harm reduction' approach to injecting drug use (WHO, UNODC & UNAIDS 2012), aimed at reducing the risk of acquiring and improving treatment and care of HIV, hepatitis and TB in PWID. The first four interventions: needle-syringe programmes (NSP), opioid substitution therapy (OST), testing and counseling for HIV and provision of antiretroviral therapy (ART) are the most critical. There is compelling evidence that NSP and OST are effective in reducing the sharing of injecting equipment and averting HIV infections. In combination with ART, these interventions reduce HIV transmission, decrease mortality, reduce drug dependency, and improve quality of life.

In March 2014, UNODC organized, in the context of the High-level Review of the 57th session of CND, a one-day Scientific Consultation in Vienna, entitled "Science addressing drugs and HIV: State of the Art", where it brought together leading scientists to discuss the latest developments in prevention and treatment of HIV and AIDS as it relates to drug use. The presentations and discussions at the Scientific Consultation revolved around six thematic topics, pre-identified by UNODC, in consultation with its civil society partners. These were: *The cost effectiveness of harm reduction; HIV,*

drugs and the legal environment; Women and drugs; Harm reduction in prisons; Compulsory detention as drug treatment and the impact on HIV outcomes; and Prevention, treatment and care of hepatitis C among people who inject drugs. The scientists were encouraged to reach out to a broader group of the relevant scientific community and gather its inputs as they were to prepare for their individual thematic paper and related presentation at the Scientific Consultation. In their commentary, Wilson, Braedon, Shattock, and Fraser-Hurt (2015) demonstrate the cost-effectiveness of key harm reduction interventions for people who inject drugs, from both government and societal perspectives, in terms of HIV outcomes and drug dependency. The commentary also provides a brief overview of current implementation levels of the various interventions by region. Access to comprehensive harm reduction services for PWID remains disproportionately low. As of 2010, globally, fewer than 8 in 100 PWID have access to OST, only 2 sterile needles are distributed per month per PWID and only 4 in every 100 eligible people who inject drugs are receiving ART (Mathers et al., 2010). HIV services are typically not responsive to the specific needs of particularly vulnerable groups of PWID, in particular women, young people, and those living in prisons and other closed settings. In the commentary by Azim, Bontell, and Strathdee (2015) the authors discuss the reasons why women who use drugs are particularly vulnerable to HIV infection, suggesting that interventions to optimize HIV prevention and care need to be sensitive to the needs of women and often, their children. A growing body of evidence indicates that the main factors behind the disproportionately low access to harm reduction services among PWID include: the lack of supporting drug policies and legislation in many countries; over-reliance of many national drug control systems on sanctions and over-use of incarceration of people who use drugs; compulsory detention for drug use and punitive practices in a number of countries in the name of treatment for drug dependence; and stigma and discrimination. In their commentary, Strathdee, Beletsky, and Kerr (2015) show how the legal environment, such as policing practices, are directly or indirectly responsible for elevated HIV risks among PWID. They also present examples where police education programs and supportive policing practices can enhance harm reduction programs rather than undermining them. The commentary by Kamarulzaman and Mc Brayer (2015) provide an overview on the increased international attention and the evolving response to the human rights abuses and the denial of medical care that often exist within the compulsory drug detention centres. It also high-

lights an increased risk of HIV transmission within these centres, providing further evidence calling for their closure.

The commentary by Dolan et al. (2015) reports that PWID are over-represented among prison populations, among whom HIV prevalence is elevated (Dolan et al., 2015). Since HIV prevention, including NSP and OST is provided very rarely in these settings, advocacy is needed to shift the focus of prison policies towards implementation of harm reduction programs, including drug dependence treatment, to protect the health of inmates and the general public.

Beyond HIV, Hepatitis C and TB epidemics are also tightly interlinked with injecting drug use and significant proportions of PWID are co-infected with two or three of these infections. The commentary by Bruggmann and Grebely (2015) reports that despite the fact that two-thirds of PWID are estimated to be living with hepatitis C virus (HCV), awareness of HCV is generally low, even among health providers, and access to HCV testing and treatment is very poor.

Based on the six thematic papers and the follow up discussions among the lead authors during the Scientific Consultation, a Scientific Statement was produced which was presented at the Plenary of the High-level Review of the CND. The text of this Scientific Statement follows this editorial. The individual scientific contributions to the pre-CND consultation have now been re-drafted, peer-reviewed and are assembled, together with the Scientific Statement in this special issue of the *International Journal of Drug Policy*. We are grateful to the authors and to the editors of the Journal for making this special issue of the IJDP possible.

Conflict of interest statement

The authors have confirmed that they have no potential conflicts of interest.

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UNODC Scientific Consultation “Science addressing drugs and HIV: State of the Art of harm reduction” A scientific statement

Context

As the Commission on Narcotic Drugs (CND) conducts its high-level review of the implementation of the Political Declaration and Plan of Action, there remains a significant discrepancy between *what science has shown actually works*, and *what in reality is being implemented* in countries most affected by HIV and hepatitis C epidemics driven by unsafe injecting drug use.

It is estimated that, of the estimated 13 (9–22) million people who inject drugs worldwide, 13% are living with HIV and more than 60% live with the hepatitis C virus with large regional variation. As long as effective measures to reduce drug consumption and unsafe injection are not implemented, HIV and hepatitis C virus will continue to spread among people who inject drugs and ultimately to their partners and to society in general. The HIV/AIDS and hepatitis C epidemics as these relate to injecting drug use are of particular concern

in Eastern Europe and central Asia and throughout the rest of the Asian region.

In its resolution 56/6 in 2013, the Commission on Narcotic Drugs requested United Nations Office on Drugs and Crime (UNODC) to implement, as appropriate, the joint WHO, UNODC and UNAIDS-recommended comprehensive package of services for people who inject drugs, also known as harm reduction services, which includes: (a) Needle and syringe programs (NSP) that provide people who inject drugs with sterile injecting equipment and remove contaminated injection material from circulation; (b) Opioid substitution therapy (OST), and other evidence-based drug dependence treatment. Opioid substitution therapy is the best researched and most effective form of treatment of opioid dependence; it is also highly effective to prevent HIV among people who inject drugs; (c) HIV testing and counseling; (d) Antiretroviral therapy (ART). Antiretroviral therapy is effective for people who inject drugs as for other patients when associated with

appropriate support; (e) Prevention and treatment of sexually transmitted infections; (f) Condom programs for people who inject drugs and their sexual partners; (g) Targeted information, education and communication for people who inject drugs and their sexual partners; (h) Prevention, vaccination, diagnosis and treatment for viral hepatitis; (i) Prevention, diagnosis and treatment of tuberculosis.

Recent studies indicate that the combination of opioid substitution therapy and needle and syringe programs can significantly reduce injecting risk behavior, HIV and, to a lower degree, hepatitis C incidence. Needle and syringe programs, opioid substitution therapy and antiretroviral therapy have a synergistic impact on the reduction of HIV incidence at a population level.

The absence of an enabling legal and policy environment and supporting regulatory framework, continues to hamper effective implementation of these programs. In many countries of the world, the provision of these evidence-based UN-recommended HIV interventions for people who inject drugs remains very limited or even absent.

According to the Harm Reduction International's *Global State of Harm Reduction* latest report, 97 countries and territories currently support a harm reduction approach, this support being explicit either in national policy documents in eighty-three countries, and/or through the implementation or tolerance of harm reduction interventions such as needle and syringe programs in eighty-six countries, or opioid substitution therapy in seventy-seven countries. Expansion of harm reduction programs has been slow and many of the new programs remain small-scale pilots. Based on the same report, opioid substitution therapy in prisons was available in only forty-one countries and needle and syringe programs in prisons in only ten countries. In most low- and middle-income countries coverage of harm reduction services remains by far insufficient to stabilize and reverse HIV and viral hepatitis epidemics among people who inject drugs.

Scientific statement

The following statement represents the current scientific evidence on prevention and treatment of HIV and hepatitis as it relates to injecting drug use.

1. There is unambiguous and compelling evidence that sharing of injecting equipment is strongly associated with the risk of acquiring HIV and hepatitis C and its ongoing spread. Criminalization of drug use, restrictive drug policies and aggressive law enforcement practices are key drivers of HIV and hepatitis C epidemics among people who inject drugs. Drug policies should fully integrate and prioritize both public and individual health in order to implement strategic and effective responses to improve health among people who inject drugs, their communities and the general population.
2. There is compelling evidence that needle and syringe programs (NSP) and opioid substitution therapy (OST) are effective in reducing sharing of injecting equipment and averting HIV infections. Together with antiretroviral therapy (ART), which is also highly likely to reduce HIV transmission among people who inject drugs, needle and syringe programs and opioid substitution therapy improve quality of life, decrease mortality and reduce drug dependency. There is also evidence that these harm reduction interventions reduce crime and public disorder, improve social functioning and provide a bridge to drug dependence treatment.
3. Laws and policies that undermine access to harm reduction are key drivers of HIV and hepatitis C risks among people who inject drugs. Laws that criminalize drug use and possession result in stigma and policy displacement, which in turn undermine support for harm reduction. In addition, law enforcement practices and especially unauthorized policing practices are a pervasive barrier to the implementation and effectiveness of harm reduction programs.

Laws facilitating needle and syringe programs and opioid substitution therapy are effective "structural" interventions to curb HIV and hepatitis C virus spread among people who inject drugs. There is an urgent need to re-align harm reduction and law enforcement approaches to support prevention and treatment of HIV and hepatitis C among people who inject drugs.
4. Hepatitis C is a rising cause of severe liver disease and premature death among people who inject drugs, and represents a growing public health, social and economic burden. Awareness of the hepatitis C infection among people who inject drugs is low although the infection is highly prevalent in this population. Hepatitis C virus testing is rarely available to people who inject drugs worldwide, and even less have access to treatment, despite the evidence that the infection is curable. Successful hepatitis C prevention strategies combine high coverage of harm reduction measures with hepatitis C treatment.

Harm reduction interventions are good value for money. There is compelling evidence of cost-effectiveness for each of the three interventions across all regions of the world, with average costs per HIV infection averted ranging from \$100 to \$1000.

The coverage of harm reduction programs is currently too low across almost all regions to have impact on spread of new HIV and hepatitis C infections. Scaling up harm reduction programs is a worthwhile investment; not only do the community benefits of harm reduction programs exceed treatment costs, but they also have the potential to provide significant returns on investments for governments.

The large number of people who inject drugs who are incarcerated and the high HIV and hepatitis C prevalence among them, together with the absence of effective harm reduction services in prisons, hamper efforts to reduce HIV prevalence among people who inject drugs and in the community. We need to stop incarceration of people who use drugs for minor drug related offenses, including by referral to HIV and drug services in the community.

Laws and policies should be implemented to ensure that the rights of people in prisons and pre-trial detention, including people who inject drugs, to access equivalent health care are respected.

Compulsory centers for drug users (CCDUs) currently operate in many countries. These centres are not only ineffective in reducing drug use but often times represent acts of abuse and torture. HIV prevention and treatment is not provided in these centers where a high proportion of the detainees is either HIV positive or are at very high risk for infection. The United Nations has repeatedly called for the closure of these centres.

Women who inject drugs often have higher rates of HIV than their male counterparts. Women who use drugs and sell sex are even more vulnerable to HIV. Harm reduction should be included in all interventions for sex workers and safer sex messages should be part of all harm reduction programs for women who inject drugs. Reproductive health services should be integrated with harm reduction services. Women who are sex partners of men who inject drugs but do not inject drugs themselves are vulnerable to HIV infection because of low condom use and intimate partner violence.

There is an urgent need to integrate hepatitis C treatment services into harm reduction services to enhance treatment uptake and cure rates. Novel, well-tolerated, and

efficacious hepatitis C treatment regimens now offer the opportunity to treat the majority of infected people who inject drugs.

This scientific statement was produced in the context of a scientific consultation entitled “Science addressing drugs and Health: State of the Art” organized by the United Nations Office on Drugs and Crime (UNODC) on 11 March 2014, preceding the high-level segment of the 57th session of the Commission on Narcotic Drugs (CND) based on thematic papers developed by David Wilson, Steffanie Strathdee, Tasnim Azim, Kate Dolan,

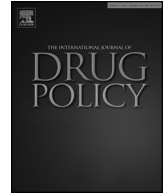
Adeeba Kamarulzaman, Philip Bruggmann, and their respective co-authors, under the overall guidance of the Co-Chair of the scientific consultation Michel Kazatchkine, United Nations Secretary General’s Special Envoy on HIV/AIDS for Eastern Europe and Central Asia and Monica Beg, Riku Lehtovuori and Fabienne Hariga of UNODC.



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Commentary

The cost-effectiveness of harm reduction

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ABSTRACT

HIV prevalence worldwide among people who inject drugs (PWID) is around 19%. Harm reduction for PWID includes needle-syringe programs (NSPs) and opioid substitution therapy (OST) but often coupled with antiretroviral therapy (ART) for people living with HIV. Numerous studies have examined the effectiveness of each harm reduction strategy. This commentary discusses the evidence of effectiveness of the packages of harm reduction services and their cost-effectiveness with respect to HIV-related outcomes as well as estimate resources required to meet global and regional coverage targets. NSPs have been shown to be safe and very effective in reducing HIV transmission in diverse settings; there are many historical and very recent examples in diverse settings where the absence of, or reduction in, NSPs have resulted in exploding HIV epidemics compared to controlled epidemics with NSP implementation. NSPs are relatively inexpensive to implement and highly cost-effective according to commonly used willingness-to-pay thresholds. There is strong evidence that substitution therapy is effective, reducing the risk of HIV acquisition by 54% on average among PWID. OST is relatively expensive to implement when only HIV outcomes are considered; other societal benefits substantially improve the cost-effectiveness ratios to be highly favourable. Many studies have shown that ART is cost-effective for keeping people alive but there is only weak supportive, but growing evidence, of the additional effectiveness and cost-effectiveness of ART as prevention among PWID. Packages of combined harm reduction approaches are highly likely to be more effective and cost-effective than partial approaches. The coverage of harm reduction programs remains extremely low across the world. The total annual costs of scaling up each of the harm reduction strategies from current coverage levels, by region, to meet WHO guideline coverage targets are high with ART greatest, followed by OST and then NSPs. But scale-up of all three approaches is essential. These interventions can be cost-effective by most thresholds in the short-term and cost-saving in the long-term.

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Introduction

HIV prevalence worldwide among people who inject drugs (PWID) is around 19% (World Health Organization, 2013) and almost one-third of HIV incident cases outside sub-Saharan Africa are related to injecting drug use (Open Society Institute, 2004). Injecting drug use is estimated to be responsible for around 10% of all HIV infections worldwide (UNAIDS, 2012). The spread of HIV among PWID has particularly driven epidemics throughout regions of Eastern Europe, and Central and Southeast Asia (Bridge, Lazarus,

& Atun, 2010; El-Bassel et al., 2014; Wu, Shi, & Detels, 2013). Indeed, in Eastern Europe and Central Asia the majority of HIV infections have been attributed to injecting drug use and this is the region of the world currently with the largest increase in HIV epidemics (UNAIDS, 2012). Some countries in the Middle East and North Africa region have also been experiencing rapidly emerging HIV epidemics among PWID (Mumtaz et al., 2014).

Many countries in Asia and Eastern Europe have responded to injecting drug use through law enforcement measures and compulsory detention (Wu, 2013). There is no evidence to suggest that compulsory detention of people who use drugs is effective in reducing drug dependency or rehabilitative, as most detained people return to drug dependency after release (Hall et al., 2012; WHO, 2009a). An alternate approach is harm reduction, which refers to methods of reducing health risks when eliminating them may not be possible. Harm reduction can also reduce social and economic

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harms that individuals experience as a result of engaging in risky activities. In the context of HIV prevention and injecting drug use, harm reduction generally includes needle-syringe programs and opioid substitution therapy. Provision of antiretroviral therapy is also considered to be within a comprehensive package of HIV-related services for PWID. Harm reduction approaches were first introduced in the Netherlands, United Kingdom and Australia in the mid-1980s in response to AIDS epidemics (Stimson, 1989). We now have three decades of data to assess the evidence of effectiveness and cost-effectiveness of these approaches. In this commentary, we discuss the cost-effectiveness of harm reduction with respect to HIV-related outcomes. We refer the reader to a complementary commentary in this issue by Bruggman and Grebely which addresses harm reduction and hepatitis C virus (HCV) epidemics, including the large opportunity to incorporate new paradigm-shifting HCV treatments into harm reduction packages (Bruggmann & Grebely, 2015).

Although they do not necessarily reduce drug dependency, needle-syringe programs (NSPs) are public health measures which aim to reduce the spread of blood-borne infections, including HIV and HCV, among PWID through the distribution of sterile injecting equipment. NSPs operate in many different modes in different contexts and they may provide a range of services that include the provision of injecting equipment, education and information on reduction of drug-related harms, referral to drug treatment, medical care and legal and social services (Heimer, 1998; Kidorf & King, 2008). Another harm reduction strategy, opioid substitution therapy (OST), has a dualistic aim of firstly reducing drug dependency among PWID, but secondly and subsequently reducing the frequency of injection and unsafe injecting practices which thereby reduces blood-borne viral transmission via injecting drug use. Methadone or other opioid substitutes are prescribed to dependent users to diminish the use and effects of opiates. The provision of ART has also become an ethically-sound and pragmatic intervention for PWID who are also living with HIV, as it reverses disease progression to increase the length and quality of life (Lohse et al., 2007). ART also reduces viral load which is expected to also decrease the likelihood of onward HIV transmission (Cohen et al., 2011; Wilson et al., 2008). These three harm reduction strategies also comprise the main elements of a nine-component comprehensive package, endorsed by the WHO, UNODC and UNAIDS (WHO, 2009b).

Numerous studies have examined the effectiveness of each harm reduction strategy. Each approach has clear evidence of impact on reducing drug dependency or reducing risk behaviours and ultimately averting HIV transmission (among other important benefits). A recent systematic review of HIV prevention programs through Asia and Eastern Europe found that interventions targeted at specific population groups, including harm reduction programs for PWID, demonstrated evidence of effectiveness and cost-effectiveness when compared to non-targeted other HIV interventions aimed at the general populations (Craig, 2014). This commentary assesses NSPs, OST and ART in isolation and then broadly the evidence of them in combination. The amount of money which society, governments and other funders are willing to pay for health and societal benefits is substantially different between settings, interventions and populations. We do not define a specific willingness-to-pay threshold for harm reduction; rather, we comment on general conclusions from studies on the cost-effectiveness ratios calculated.

Effectiveness and cost-effectiveness of NSPs

NSPs have been shown to be safe and effective in reducing HIV transmission in diverse settings (Bastos & Strathdee, 2000; Jenkins et al., 2001; Kwon et al., 2009; Vickerman et al., 2006;

Wodak, 2006). A recent review of reviews found sufficient evidence of NSPs to reduce self-reported risky injecting behavior and tentative evidence of effectiveness of NSPs to reduce HIV transmission (Palmateer et al., 2010). Two recent comprehensive reviews found compelling evidence that NSPs are associated with favorable outcomes for PWID (Gibson, Flynn, & Perales, 2001; Wodak & Cooney, 2005) with the more recent review finding that increasing the availability of sterile injecting equipment to PWID reduces HIV infection; 23 of 33 studies reviewed found positive outcomes on HIV risk behavior, with one finding negative outcomes, 5 having indeterminate outcomes, and 6 investigating a variety of other outcomes with either positive or indeterminate results (Wodak & Cooney, 2005). Further, a review of ecological data from 81 cities across Europe, Asia and North America found that HIV prevalence increased by an average of 5.9% per year in the 52 cities without NSPs but HIV prevalence decreased by 5.8% per year in the 29 cities with NSPs (Hurley, Jolley, & Kaldor, 1997); note that mortality rates at the time of this study may have influenced prevalence trends. A particularly notable example of impact was demonstrated in New York, where the introduction of NSPs was associated with a sharp decrease of HIV incidence in the early 1990s from 4% per year to 1% (Des Jarlais et al., 1996, 2005). There are many examples where the lack of NSPs has led to large increases in HIV incidence. For example, HIV prevalence in Cebu, Philippines recently escalated drastically from 0.5% in 2009 to 53% in 2011; similarly rapidly exploding epidemics have been observed in Sargodha (Pakistan), Bangkok (Thailand) and Manipur (India) where HIV prevalence increased from near zero within a few months to reach levels of 20–50% (Choopanya et al., 1991; Emmanuel et al., 2009; Sarkar et al., 1993). NSPs reduce the probability of transmission of HIV and other blood-borne diseases by lowering the rates of sharing of injecting equipment among PWID. Surveillance in Victoria and Vancouver, Canada found that there were similar behaviors in the two cities with NSPs but subsequent to the closure of needle-exchange clinics in Victoria, needle sharing became significantly more prevalent (23%) in Victoria compared to Vancouver (8%) where needle exchange clinics remained open (Ivsins et al., 2010).

NSPs are relatively inexpensive to implement. The average cost of NSP provision has been estimated by UNAIDS to be US\$23–71 per person per year (Wilson & Nicole, 2013) depending on region of the world and delivery system (pharmacies, specialist programme sites, vending machines, mobile outreach vehicles) (Schwartlander et al., 2011). Given their relatively low costs and evidence of effectiveness, NSPs are recognized as one of the most cost-effective public health interventions ever funded (International, 2012). Studies in numerous countries have repeatedly provided compelling evidence that NSPs are cost-effective both from societal and health sector perspectives (Vickerman, Miners, & Williams, 2008; Wodak & Maher, 2010). A systematic review found that all 12 included studies that examined the impact of NSPs on HIV infection found that NSPs were cost-effective according to the studies' defined willingness-to-pay thresholds (Jones, Pickering, Sumnall, McVeigh, & Bellis, 2008). Increasingly, evidence has found net financial benefits of NSPs across all regions and in high- and low-income settings (Belani Hrishikesh & Muennig, 2008; Guinness et al., 2010; Ni et al., 2012). For example, NSPs are cost saving when compared to the lifetime costs of HIV/AIDS antiretroviral treatment (Jones et al., 2008) and a recent study estimated that not only did NSPs reduce the incidence of HIV by up to 74% over a 10 year period in Australia but found that they were cost savings and had a return on investment of between \$1.3 and \$5.5 for every \$1 invested (Kwon et al., 2012). Table 1 illustrates the cost-effectiveness ratios of NSPs in Eastern Europe and Central Asia where injecting drug use is prevalent.

Table 1

Illustrative examples of cost-effectiveness of NSP in Eastern Europe and Central Asia (implemented 2000–2010).

Country	QALYs gained	ICER (US \$ per QALY gained)
Armenia	223–251	Return ~ investment
Belarus	1310–1642	\$1405–1896
Estonia	41–53	\$102,375–132,374
Georgia	41–56	\$19,811–27,633
Kazakhstan	2364–2518	\$5758–6256
Moldova	559–1026	\$1882–3640
Tajikistan	909–1283	\$2104–3024
Ukraine	3903–7949	\$867–2540

Source: Wilson et al. (2014).

Effectiveness and cost-effectiveness of OST

There is evidence that substitution therapy for heroin and other opiates is effective in reducing drug use and behavior related to transmission of blood-borne viruses, including complete cessation of injecting drug use (Ball et al., 1988; Hubbard et al., 1988; OECD et al., 2014; Yancovitz et al., 1991). A recent meta-analysis of studies conducted in North America, Europe and Asia found that OST using methadone maintenance treatment was associated with a 54% reduction in risk of having HIV infection among PWID (rate ratio of 0.46, 0.32–0.67 95%CI) (MacArthur et al., 2012). Numerous Cochrane reviews have been conducted on OST with respect to their effectiveness in treating opioid dependence, psychosocial and other outcomes; one of these reviews addressed the evidence of OST for prevention of HIV infection (Gowing et al., 2011). It found that OST reduces drug-related behaviours with a high risk of HIV transmission, but has less effect on sex-related risk behaviours, and that the lack of data from randomised controlled studies limits the strength of the evidence. It is unethical to design a randomised controlled study and thus difficult to obtain stronger evidence than exists on the effectiveness of OST.

OST is more expensive than NSPs at US\$363–1057 per patient per year for 80 mg methadone and US\$1236–3167 per patient per year for buprenorphine (Schwartlander et al., 2011). Despite the higher costs, modelling studies have estimated that OST is a marginally-to-reasonably cost-effective strategy when compared to current practice and considering HIV benefits only (Degenhardt et al., 2010), ranging from a cost of US\$3324 per HIV infection averted (as indicated by a study in Vietnam) (Tran et al., 2012) to approximately US\$7000 per HIV infection averted (as demonstrated by a study of HIV prevention in a high prevalence Indonesian setting) (Wammes et al., 2012). However, the largest benefits of OST are related to wider psychosocial and social benefits including reduction in the number and severity of relapses due to opiate use, and reduced rates of criminal activity and incarceration for drug-related crimes. If these factors are also included in economic analyses, OST is substantially more cost-effective. Furthermore, OST has wider quality of life and economic benefits (Hammett, 2014). For example, a recent study found that methadone maintenance therapy is associated with large reductions in health care service utilization, reduced out-of-pocket costs by HIV-positive people who use drugs and could likely reduce the economic vulnerability of households affected by injecting drug use (Tran & Nguyen, 2013).

In terms of comprehensive HIV responses, OST programs fall into the category of structural interventions, which addresses multisectoral, distal drivers of HIV infection. In implementing these interventions as part of a repertoire of HIV interventions, the policy environment recognizes the reality that these types of programs have multiple health-related and other benefits. Such structural HIV interventions call for cross-sector financing models, which distribute the costs in accordance with the benefits (Remme et al.,

2012). If a cross-sector cost-benefit analysis is applied to cost-effectiveness analyses of OST (e.g., by replicating the method used by Remme et al. when examining structural interventions such as cash transfers to young women (Remme et al., 2012, 2014)) then the overall cost-effectiveness ratios of OST would improve by a factor of around 10–20-fold (results not shown). OST is thus highly cost-effective according to almost any willingness-to-pay thresholds.

Effectiveness and cost-effectiveness of ART

There is strong evidence, including from a randomised controlled trial, that ART reduces infectivity among HIV-positive heterosexuals (Anglemyer et al., 2011; Attia et al., 2009; Cohen et al., 2011; Quinn et al., 2000). Currently, there is little evidence that treatment as prevention is as effective for MSM and for PWID although it is highly plausible that this strategy is likely to reduce transmission rates substantially among these groups (Kelley et al., 2011; Wilson, 2010). Additionally, ART may also be given to HIV-negative individuals as pre-exposure prophylaxis (PrEP). PrEP has now been shown to reduce transmission among PWID by 48.9% in the Bangkok Tenofovir Study (BTS) (Choopanya et al., 2013); however, we note that this trial was undertaken in an environment where other harm reduction approaches are highly restricted and illegal.

While UNAIDS estimated that the minimum cost of providing ART to be US\$176 per person per year in 2010 and project this cost to decline to USD \$125 by 2020, studies have indicated that the average annual costs of treating an HIV-positive PWID per year can be anywhere between US\$1000 and US\$2000 in low- and middle-income countries (Wilson & Nicole, 2013).

Many studies have shown that ART is cost-effective not only for the purpose of keeping people alive but also because of its prevention benefits (Kahn et al., 2011; Loubiere et al., 2010; Wilson et al., 2014). Considering the prevention and treatment benefits, ART is a highly favourable intervention. However, there is relatively little evidence of cost-effectiveness of ART specifically targeted to PWID. A study in Russia estimated that ART would cost around US\$1501 per QALY gained when targeted to PWID which is considered good value for money (Long et al., 2006). The cost-effectiveness of PrEP for PWID will vary according to HIV incidence among the PWID targeted and with the cost of PrEP. Assuming that the measured efficacy of PrEP among PWID in the BTS (of 48.9%) is maintained with broader scale-up outside of a trial setting, cost-effectiveness ratios can be estimated. In high-income countries, the cost per HIV infection averted would range between US\$25,000–1.8 million; the cost per infection averted would be US\$4200–75,000 when discounted tenofovir is available and US\$1200–18,000 where generic tenofovir is available (Craig et al., 2013). These ranges suggest that PrEP may not be cost-effective in all settings compared with commonly funded health interventions.

It is important to note that coverage of ART among HIV-positive PWID is less than 1% in many countries (Mathers et al., 2010). It would be expected that coverage of antiretrovirals among HIV-negative PWID would be substantially lower. Therefore, due to expected low coverage and unimpressive cost-effectiveness ratios, we believe that PrEP is unlikely to be largely utilised for HIV prevention among PWID. However, ART for people living with HIV would be very cost-effective.

Effectiveness and cost-effectiveness of combination strategies

No single harm reduction approach is sufficient. The evidence suggests that comprehensive prevention strategies are synergistic (Beyrer et al., 2010; Lert & Kazatchkine, 2007; Strathdee et al., 2012; Wood et al., 2002). Modelling for Eastern Europe and Central Asia has shown that NSPs alone have small effect unless they

Table 2
Estimated annual cost of scaling up harm reduction by region.

Region	Harm reduction strategy (current coverage) ^a	Annual cost (USD) of scale up to reach 'Mid coverage targets' (%) ^b	Annual cost (USD) of scale up to reach High coverage targets (%) ^b
South East Asia	NSP (11.5%)	\$26,844,300 (20% Coverage)	\$153,600,300 (60% coverage)
	OST (5.9%)	\$360,975,675 (20% Coverage)	\$872,526,675 (40% Coverage)
	ART (3.6%)	\$856,463,175 (25% Coverage)	\$2,859,660,675 (75% Coverage)
Eastern Europe and Central Asia	NSP (11.7%)	\$19,099,100 (20% Coverage)	\$111,454,300 (60% coverage)
	OST (<1%)	\$715,465,800 (20% Coverage)	\$1,466,224,200 (40% Coverage)
	ART (1.1%)	\$1,163,126,925 (25% Coverage)	\$3,593,036,925 (75% Coverage)
Latin America and the Caribbean	NSP (2%)	\$8,331,120 (20% Coverage)	\$26,844,720 (60% coverage)
	OST (<1%)	\$427,631,100 (20% Coverage)	\$857,411,100 (40% Coverage)
	ART (1%)	\$690,292,800 (25% Coverage)	\$2,128,402,800 (75% Coverage)
Middle East and North Africa	NSP (2.0%)	\$1,350,360 (20% Coverage)	\$4,351,160 (60% coverage)
	OST (1%)	\$23,173,920 (20% Coverage)	\$47,567,520 (40% Coverage)
	ART (<1%)	\$34,091,750 (25% Coverage)	\$102,275,250 (75% Coverage)
Western Europe, North America and Australasia	NSP (17.0%)	\$16,625,550	\$238,299,550
	OST (27.8%)	–	\$954,741,990
	ART (78.5%)	–	–

^a Source: Mathers et al. (2010).

^b Source: Scale-up calculations by UNSW.

are combined with other evidence-informed, rights-based combination interventions, particularly access to OST and ART (Lacombe & Rockstroh, 2012). Programs which employ a combination of harm reduction strategies have had demonstrable success in improving health outcomes for PWID (Degenhardt et al., 2010). Such a strategy in Amsterdam resulted in a 57% decrease in HIV incidence and 64% decrease in HCV incidence in a distinct cohort (Van Den Berg et al., 2007). Similar positive results have been found in Malaysia, where a combination of harm reduction programs have averted an estimated 12,653 HIV infections since 2006 (Naning et al., 2013). Furthermore, adherence to ART could likely be improved if combined with OST programs (WHO, 2012).

Combination programs that combine harm reduction interventions have also demonstrated good value for money (Degenhardt et al., 2010). This includes a recent study in Ukraine which found that a harm reduction strategy which expands both methadone and ART to PWID is not only more effective than a methadone-only strategy, but is also deemed to be cost-effective at an estimated US\$1120/QALY gained (Alistar, Owens, & Brandeau, 2011). Another study in China found the expansion of combination strategies which employ ART, voluntary testing and counselling, and harm reduction to cost an estimated \$9310 per QALY gained when compared to a base case of essentially no harm reduction program (Li et al., 2012); this is likely to be around or less than willingness-to-pay thresholds for upper-middle-income countries like China.

Scaling up harm reduction interventions and evidence of returns on investment

Despite increasing prevalence of injecting drug use and established evidence of effectiveness and cost-effectiveness, the coverage of harm reduction programs remains appallingly low (Mathers et al., 2010).

As of 2012, there were 97 countries and territories that supported a harm reduction approach, exemplified either in national policy documents or tolerance or implementation of harm reduction interventions (International, 2012). Yet, high coverage (defined by the 2009 WHO, UNAIDS, UNODC Technical Guide as more than 200 needles or syringes provided per PWID per year) of NSPs has only been achieved in a few countries in Europe, Australia, a small number of countries in Asia, Brazil, and Iran (UNAIDS, 2013; Des Jarlais et al., 2013). A recent review suggested that only 10% of PWID in Eastern Europe and 36% in Central Asia access NSPs, with an average of nine and 92 needle-syringes distributed per PWID per year,

respectively (Mathers et al., 2010). As such, an estimated 90% of PWID worldwide are not accessing NSPs. Despite being provided in 77 countries worldwide, there are also significant coverage gaps with OST, which remains unavailable in 81 countries with reported injecting drug use. Furthermore, it is estimated that only 8% of PWID globally have access to OST, with coverage particularly low in parts of sub-Saharan Africa, Latin America and Asia. Encouragingly however, high OST coverage has been reported in Iran, Czech Republic and Western Europe, and several countries in Asia and the Middle East have begun to scale-up their programs; China has recently had the largest OST scale-up program in the world. Uptake of ART by HIV-infected PWID shows the largest disparities with what is required or deemed to be appropriate access. Only 14% of HIV-positive PWID globally have access to ART, with the largest gaps in ART provision in Eastern Europe and Central Asia (where almost no PWID in some countries have access to ART).

It is clear that harm reduction programs have yet to be scaled up or implemented in a way to be commensurate with their expected population benefits and yield the full economic benefits (International, 2012). Even where new initiatives have been implemented, they are generally small-scale (International, 2012). More worryingly, numerous countries with some of the highest HIV burdens among PWID have appeared to significantly scale down harm reduction interventions (International, 2012). This is likely due to previous support from international donors being withdrawn and not replaced by domestic sources.

There are numerous socio-political and legislative reasons for poor coverage of harm reduction. Coverage cannot be improved without first addressing the stigma, discrimination and intolerance that restricts the expansion of harm reduction. Addressing these barriers remains of paramount importance for facilitating effective harm reduction programs. We refer the reader to a complementary commentary in this issue by Strathdee et al. on harm reduction and the law (Strathdee et al., 2015).

The evidence presented here suggests that all harm reduction interventions could be further expanded. The potential reach and costs of scaling up any of the three interventions are dependent not only of the costs of the intervention, but also on the prevalence of injecting drug use and on the current coverage of interventions. In Table 2 we provide our estimates of the total annual costs of scaling up each of the harm reduction strategies from current coverage levels, by region, to meet WHO guideline coverage targets. We note that required costs for ART are greater than for NSPs and OST. However, ART budgets should be separate to harm reduction budgets. In

every region of the world, coverage of NSPs is substantially greater than coverage of OST. OST is more expensive than NSPs and therefore it is not surprising that it will cost a lot more to scale up OST to mid-levels than it would take to scale-up NSPs to high levels. It would be relatively inexpensive to attain mid-coverage levels of NSPs across every region of the world.

Scale up of all three approaches is essential. These interventions can be cost-effective in the short-term according to common locally applied willingness-to-pay thresholds and cost-saving in the long-term. There are economies of scale as programs mature and increase in coverage (Marseille et al., 2007; Menzies et al., 2011). Increasing coverage may require governments to expand national public sector infrastructure, health systems capacity, and outreach services whereas achieving requisite scale efficiency could entail increasing delivery systems with low fixed operation costs, through drop-in centers and other innovative approaches (Lurie et al., 1998). In particular, reductions in unit costs can further improve the cost-effectiveness of these approaches, in particular when these are implemented in an overall comprehensive and evidence-informed manner (Tilson & Bozette, 2007).

Conclusion

The need to improve health outcomes for PWID, including reducing the high and increasing rates of HIV (and HCV) transmission, remains an urgent task for health providers and governments across the world. The coverage of harm reduction programs among PWID populations is currently too low across almost all global regions and the programs have yet to sufficiently scale up to lead to the population impact commensurate with their known effectiveness and cost-effectiveness. Not only is there an ethical imperative to make harm reduction programs universally available, but in stark contrast to compulsory detention, these approaches are globally effective, represent good value for money and are often cost-saving, indicating their value to improving the health outcomes for PWID and the broader population.

The internationally endorsed priority harm reduction interventions are fully supported by the available evidence. OST, NSPs and ART together are effective in reducing drug dependency, reducing sharing of injecting equipment, improving quality of life and averting HIV infections. Notably, NSPs and OST have been proven to avert HIV cases among PWID, and OST also has greater societal benefits associated with reduction in drug dependency. There is compelling evidence of value for money for each of the three interventions across all regions, with all generally cost-effective in the short-term and very cost-effective to cost-saving when long-term and societal benefits are considered. Importantly, cost-effectiveness ratios in terms of costs per HIV infection averted among PWID are highly favorable, ranging from \$100 to \$1000. Implementing these strategies in combination would likely improve their effectiveness and cost-effectiveness.

To reverse epidemics of blood-borne viral infections, particularly in a global environment of decreasing HIV/AIDS financial commitments, and to effectively respond to the social and health needs of PWID, it is important to identify the most cost-effective interventions. National governments may wish to re-examine their approaches to responding to PWID and consider how the strong evidence and rationale for harm reduction programs can influence future funding allocations within national public health programs. Although the overall costs of scaling up harm reduction programs will be high, it will be a worthwhile action for governments to adopt; not only do the societal benefits of harm reduction programs exceed treatment costs, but they will also present significant returns on investment due to infections and subsequent health costs which are averted. At the same time, governments need to

ensure sufficient health systems and public sector capacity is in place to successfully implement harm reduction strategies. This means investing not only in the strategies themselves but also investing in health systems infrastructure and overcoming or dismantling structural barriers of access for PWID to health care services.

The contents and conclusions of the paper reflect a broad consensus among social and clinical scientists participating in a UNODC Scientific Consultation on HIV/AIDS (UNODC Scientific Consultation, 2014).

Conclusion statements

- There is evidence that opioid-substitution therapy (OST), needle-syringe programs (NSP) and antiretroviral therapy (ART) together have established effectiveness in reducing drug dependency, reducing sharing of injecting equipment, improving quality of life and averting HIV infections.
- The unit costs of harm reduction interventions are relatively low, but can vary by provider type, delivery model and region. Generally, NSPs are least expensive, while the costs of ART are expected to decline by 2020. OST is a structural intervention with other societal benefits: when such benefits are included, the attributable cost for HIV budgets and cost-effectiveness ratios are highly favourable.
- Globally, harm reduction interventions are good value for money, improving health outcomes for PWID. There is compelling evidence of cost-effectiveness for each of the three interventions across all regions. The estimated cost-effectiveness ratios for priority intervention packages for PWID and HIV-positive PWID are highly favorable for all regions, with costs per HIV infection averted ranging from \$100 to \$1000.
- The coverage of harm reduction programs is currently too low across almost all regions. Although the overall costs of scaling up harm reduction programs will be high, it will be a worthwhile action; not only do the societal benefits of harm reduction programs exceed treatment costs, but they also have the potential to provide significant returns on investment for governments.

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Conflict of interest

All authors have no relevant conflicts of interest to declare.

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Commentary

People who inject drugs in prison: HIV prevalence, transmission and prevention



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ABSTRACT

In 2011, over 10.1 million people were held in prisons around the world. HIV prevalence is elevated in prison and this is due to the over representation of people who inject drugs (PWID). Yet HIV prevention programs for PWID are scarce in the prison setting. With a high proportion of drug users and few prevention programs, HIV transmission occurs and sometimes at an alarming rate.

This commentary focuses primarily on drug users in prison; their risk behaviours and levels of infection. It also comments on the transmission of HIV including outbreaks and the efforts to prevent transmission within the prison setting.

The spread of HIV in prison has substantial public health implications as virtually all prisoners return to the community. HIV prevention and treatment strategies known to be effective in community settings, such as methadone maintenance treatment, needle and syringe programs, condoms and antiretroviral therapy should be provided to prisoners as a matter of urgency.

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Introduction

Globally, in 2011 over 10 million people were held in prison (Walmsley, 2013) and of these 2.5–3 million were held in pre-trial detention (Walmsley, 2014). However, the turnover in prison populations is estimated to be at least three times that with some 30 million individuals being detained and released into the community each year. Female prisoners receive even less attention than their male counterparts. Women are a minority within the population of prisoners. Typically, they make up about 5–10% of prison populations in most countries (Walmsley, 2013). Yet the prevalence of drug use among them is much higher than their male counterparts and drug treatment options are usually more limited for female prisoners than for males.

People who inject drugs within prison populations

Drug users are vastly over represented in prison populations. Internationally, 10–48% of male and 30–60% of female inmates

have used illicit drugs in the month before entering prison (Fazel, Bains, & Doll, 2006). In the US, between 24% and 36% of all heroin addicts pass through the corrections system each year, representing more than 200,000 individuals (Boutwell, Nijhawan, Zaller, & Rich, 2007). Over 60% of PWIDs in a 12-city study reported a history of imprisonment (Ball et al., 1994) and in one Australian study, PWID reported an average of five imprisonments (Dolan, Wodak, & Hall, 1999).

The frequent and repetitive imprisonment of drug users is the key reason for continuous growth in the size of prison populations. From 1996 to 2006, the US population rose by 13% and the incarcerated population rose by 33% yet the proportion of prisoners with a drug problem rose by 43%. Furthermore, the prison population has increased in all five continents. Over the last 15 years the world imprisonment rate has risen from 136 per 100,000 to the current rate of 146 per 100,000 (Walmsley, 2014).

Rates of re-incarceration are especially high for inmates with a drug problem. Drug dependent offenders are much more likely to return to prison than other offenders. In the US, over 50% of drug dependent inmates have a previous incarceration compared with 31% of other inmates. In Australia, 84% of heroin dependent inmates were re-incarcerated within two years of release compared to 44% of all prisoners (Steering Committee for the Review of Government

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Service Provision, 2010). These high rates show that drug offenders are not being treated for their drug dependence while in prison.

Risk behaviours in prison

Many drug users stop using and injecting drugs when imprisoned. For other prisoners though, some will commence drug use or switch the route of drug administration if their preferred drug is unavailable (Fazel et al., 2006). A study in Belgium found that 30% of drug-using prisoners began using an additional drug and heroin was the drug most frequently mentioned (EMCDDA, 2012). According to research across 15 European countries, between 2 and 56% of prisoners report drug use while incarcerated and among nine countries the prevalence ranged from 20 to 40% (EMCDDA, 2012).

A history of injecting drug use is substantially higher among prisoners than among the general population. Reports from Europe suggest that between 2 and 38% of prisoners have injected drugs at some time. This is in sharp contrast to the proportion of the community who inject drugs (0.3%; EMCDDA, 2012). These figures highlight the need for good coverage of a range of HIV prevention programs for prison inmates.

Studies of prisoners find a high level of injecting and an extremely high level of syringe sharing in prison. Two studies of general prisoners in Greece (Koulierakis et al., 2000; Malliori et al., 1998) found 24% and 20% injected in prison and 92% and 83% shared syringes, respectively. In a large Russian study, 10% of 1000 inmates injected with 66% sharing syringes (Frost & Tchertkov, 2002). In Thailand, Thaisri reported that 25% of 689 inmates injected of whom 78% shared syringes (Thaisri et al., 2003).

Studies of prisoners with a history of injecting find even higher rates of injecting in prison. Two Scottish surveys reported that 37% and 58% of injectors had injected in prison in the previous month (Bird et al., 1997). HIV positive inmates in the UK were significantly more likely to inject (46% vs. 18%) and share syringes (42% vs. 12%) than those who were HIV negative or unsure of their status (Dolan et al., 1990). Among Australian PWID, some 30–74% reported injecting in prison and 70–90% of those reported syringe sharing (Rutter et al., 1996).

Reports from developing countries also indicate high levels of injecting and sharing of equipment. In Pakistan, 80% of PWID had been to jail where reports of injecting ranged from 22% to 70% and syringe sharing was 56% (Nai Zindagi, 2009). Nepal has reported that 19% of inmates in five prisons had a history of injecting drugs (Dolan & Larney, 2009).

Needles and syringes are scarce in the prison setting. With few needles and syringes circulating among many drug injecting inmates, sharing is inevitable. Up to 15 or 20 individuals may inject with the same equipment. A study of 69 syringes confiscated from prison revealed most were cut to just a few centimetres in length, some contained visible traces of blood and the hepatitis C virus was detected (Dolan, Larney, Jacka, & Rawlinson, 2009). Some inmates make their own syringes with needle substitutes fashioned out of hardened plastic and ball-point pens, often causing damage to veins and scarring (EMCDDA, 2012). All of these improvisations hamper any efforts to decontaminate the equipment.

HIV prevalence

Given the preponderance of PWID in prison, it is unsurprising that the levels of HIV infection are elevated. However some figures are extraordinarily high. For example, 28% of general prisoners in Vietnam were HIV positive in 2000 (Anonymous, 2000). In Estonia, up to 90% of inmates were HIV positive in 2004 (Tsereteli, 2004).

Other countries have managed to control HIV infection among their prison populations. In Australia, HIV prevalence is almost zero,

even though PWID account for approximately 50% of prison populations (Butler, 2011).

HIV transmission in prison

HIV transmission in prison is difficult to document owing to uncertainties regarding precise date of infection, the rapid turnover of inmates, low levels of HIV testing and inmates' reluctance to report risk behaviours to prison authorities (Dolan, 1997). Nevertheless, reports of transmission have been made (Brewer et al., 1988; CDC, 1986; Horsburgh, Jarvis, & McArthur, 1990; Mutter & Grimes, 1994).

The first epidemic outbreak of HIV in Thailand started among PWID in a Bangkok prison in 1988. HIV infection among PWID in the community rose from 2 to 43% from 1987 to 1988. The increase was detected after hundreds of prisoners were released in an amnesty on the King's birthday. Further investigation found two risk factors were independently associated with HIV infection: having shared needles with two or more individuals in the previous six months and having been in prison. PWID with a history of imprisonment were twice as likely to be HIV positive as those who had never been imprisoned. HIV incidence in Thai prisons was very high at 35 per 100 person years (Choopanya et al., 1991, 2002).

Lithuania and Russia both suffered major outbreaks of HIV in particular prisons. In Lithuania, the outbreak in Alytus prison resulted in at least 284 inmates being infected within a six month period. These new infections doubled the total number of HIV cases in the country (Caplinskiene, Caplinskas, & Griskevicius, 2003; Dolan et al., 2007). Meanwhile the outbreak in a Russian prison in Nizhnekamsk resulted in over 400 inmates in a population of 1824 acquiring HIV, again in a brief period (Nikolayev, 2014).

Although the numbers infected have not been reported, both Ukraine and Iran experienced HIV outbreaks among their inmate populations. In Ukraine, an HIV outbreak was registered in a minimum security prison colony and attributed to unprotected sexual activity and drug injection in prison (Gunchenko & Kozhan, 1999). Iran reported two large outbreaks of HIV in prisons with hundreds infected (Farnia, Ebrahimi, Shams, & Zamani, 2010). These outbreaks in Iranian prisons were the impetus for the development of policies to allow for the introduction of needle and syringe and methadone programs into prison.

HIV outbreaks have also occurred in prison populations even where HIV prevalence was very low. Both Scotland (Taylor, Goldberg, & Emslie, 1995) and Australia (Dolan and Wodak, 1999) experienced outbreaks where between 4 and 12 inmates were infected within a few months.

Prevention

Internationally, HIV prevention efforts in prisons have been poor in comparison to those in the surrounding communities (Dolan et al., 2014). HIV education is the most widely used HIV prevention intervention in prisons, but is insufficient unless prevention programs are also provided. In 2012, methadone treatment was available in prison in 41 countries even though it was available in the community in 77 countries (HRI, 2012). Needle and syringe programs were available in prison in just 13 countries but operated in the community in 86 countries (HRI, 2012). Meanwhile condoms were provided to prisoners in 28 countries but available in the community settings in virtually all countries. This inequality of health care provision between the community and the prison setting contravenes international law as well as in international rules, guidelines, declarations and covenants (UNODC et al., 2013).

Each and every type of these programs; methadone maintenance treatment, needle and syringe programs and condoms, has been evaluated favourably in the prison setting (Jurgens, Ball, &

Verster, 2009) but the implementation of these programs has not improved.

Conclusion

Despite the size of the world prison population, prisoners have been largely forgotten in the HIV response (Dolan et al., 2014). Some of the reasons for the lack of research and action in this area are the obstructive nature of prison authorities, the lack of interest in the area by funders and the overcautious approach of ethics committees. Prison authorities have been known to delay approval, limit the scope of research questions and veto publication of results (Thomson, Reid, & Dolan, 2009). Although two thirds of the 2.3 million inmates in the U.S. meet the DSM-IV medical criteria for addiction only 11% received treatment with less than 1% of prison budgets spent on treatment (CASA, 2010).

Tens of million people are imprisoned every year and an estimated 30 million pass through a correction centre each year. This population is at least twice the size of the estimated population of PWID (HRI, 2012).

PWID is the main group in prison in terms of HIV risk behaviour. Even though they make up about one third to one half of prison populations, they are usually detained without access to treatment for drug dependence or HIV infection. Many continue to inject while detained and some commence injecting when imprisoned. Without interventions, their levels of syringe sharing remain extraordinarily high, as is their re-incarceration rate. Reports from many countries in the developed and developing world show a similar pattern in terms of the overrepresentation of PWID, their engagement in risk behaviour, high levels of HIV infection and transmission.

Occasionally outbreaks of HIV among prison populations have been the impetus for the development of policies to allow for the introduction of needle and syringe and methadone programs. However, the level of implementation of HIV prevention programs is woeful across the world; less than 50 countries provide MMT, NSP or condoms to prisoners. This is despite there being ample evidence that these programs are effective in the prison setting.

Therefore a new approach is needed to reorientate the focus of prison policy to increase the implementation of these programs in order to protect inmates' health. International leadership could come from funders such as the World Bank or the Gates Foundation.

Recommendations

There is sufficient evidence to address the most frequent mode of HIV transmission among inmates: injecting drug use. Sizeable numbers of prisoners inject drugs while incarcerated and usually with shared injecting equipment. Therefore, the primary goal has to be the reduction of drug injecting in prison. One way to achieve this is to reduce the number of drug injectors who are sent to prison. There is abundant evidence that community-based methadone treatment reduces injecting, crime and the subsequent incarceration of drug users.

Another way is to target pre-trial detainees; these account for over a third of all individuals in prisons worldwide. Prisoners are frequently held in overcrowded, substandard conditions without medical treatment or any measures for infection control. International standards clearly state that pre-trial detention should be an exceptional measure used sparingly. Therefore, programmes providing safe alternatives to pre-trial detention for persons accused of low-level crimes should be implemented (Csete, 2010).

A third way to reduce the level of drug injecting in prison is to provide methadone maintenance treatment during incarceration.

MMT reduces injecting and sharing in prison populations (Dolan, Shearer, White, Zhou, & Wodak, 2005; Larney, Toson, Burns, & Dolan, 2012). Releasing inmates on methadone treatment reduces their chance of being re-incarcerated, and this was demonstrated as early as 1969, in one of the first studies of MMT (Dole et al., 1969). Yet prison authorities struggle with accommodating more prison entrants, rather than provide evidence based drug treatment. Another advantage of releasing inmates on methadone treatment is their risk of experiencing a fatal overdose in the period immediately after release (Farrell & Marsden, 2008) is greatly reduced (Dolan et al., 2005).

Drug injecting in prison is also likely to be reduced if prisoners receive lesser punishment for the use of non-injectable drugs compared with injectable drugs. Yet prisoners usually receive the same penalty whether they test positive on urinalysis for cannabis or for heroin. Research in the UK found that inmates moved from smoking cannabis (detectable in urine for weeks) to injecting heroin (detectable in urine for only a day or two) after mandatory drug testing was introduced (Boys et al., 2002). Differential sanctions for drug use within prison should be explored as a way to reduce the level of injecting.

The overreliance on the use of supply reduction measures within prisons warrant investigation. Many prison authorities conduct urinalysis at the expense of effective demand and harm reduction strategies. An examination of supply reduction measures in Australian prisons found despite an extensive use of drug searches and urinalysis, the detection of drugs was modest. The most commonly used drug was cannabis with the detection of drugs such as amphetamines and heroin being very low (Dolan & Rodas, 2014).

Without doubt, the most controversial strategy has been prison based needle and syringe exchange programs. These programs have been implemented in 70 different prisons in over one dozen countries. In countries where needle and syringe programs are provided outside prison, consideration should also be given to providing it inside prison. The introduction of needle exchange programmes should be carefully prepared, including providing information and training for prison staff (UNODC, 2014).

Prisoners should have access to medical treatment and preventive measures without discrimination on the grounds of their legal situation. Health in prison is a right guaranteed in international law, as well as in international rules, guidelines, declarations and covenants (UNODC et al., 2013). The right to health includes the right to medical treatment and to preventive measures as well as to standards of health care at least equivalent to those available in the community (Jürgens & Betteridge, 2005).

Numerous policies, handbook and manuals have been developed to assist prison authorities to address HIV in prison. The Comprehensive package on HIV prevention, treatment and care in prisons and other closed settings provides a good overview of which interventions to implement (UNODC et al., 2013).

The contents and conclusions of the paper reflect a broad consensus among social and clinical scientists participating in a UNODC Scientific Consultation on HIV/AIDS (UNODC, Scientific Statement, March 11, 2014).

Conclusion statements

- The world prison population is growing. Of the 10 million prisoners, 3 million are on remand. About 30 million individuals are detained and released into the community each year.
- Drug users make up one and two thirds of inmates. In the US, 200,000 heroin addicts are jailed each year. Rates of re-incarceration are especially high for inmates with a drug problem, yet very few receive drug treatment.

- Some inmates stop drug use in prison. Others continue or initiate drug use inside and among the PWID, almost all share syringes and with a multitude of partners.
- HIV prevalence is elevated among prisoners and transmission in prison occurs sometimes at epidemic rates. HIV prevention efforts in prisons are rarely implemented and almost never to scale.
- Minor drug offenders need treatment not incarceration. Imprisoned drug offenders need treatment to reduce their risk of relapse and re-incarceration.
- Advocacy is required to reorientate the focus of prison policies to implement drug treatment and harm reduction programs in order to protect the health of inmates and the general public.

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Conflict of interest statement

We the authors declare that we have no conflict of interest with regard to this study.

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Commentary

Women, drugs and HIV

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ABSTRACT

Background: Women who use drugs, irrespective of whether these are injected or not, are faced with multiple issues which enhance their vulnerability to HIV.

Methods: In this commentary, we explore the HIV risks and vulnerabilities of women who use drugs as well as the interventions that have been shown to reduce their susceptibility to HIV infection.

Results: Women who inject drugs are among the most vulnerable to HIV through both unsafe injections and unprotected sex. They are also among the most hidden affected populations, as they are more stigmatized than their male counterparts. Many sell sex to finance their own and their partner's drug habit and often their partner exerts a significant amount of control over their sex work, condom use and injection practices. Women who use drugs all over the world face many different barriers to HIV service access including police harassment, judgmental health personnel and a fear of losing their children.

Conclusion: In order to enable these women to access life-saving services including needle-syringe and condom programs, opioid substitution therapy and HIV testing and treatment, it is essential to create a conducive environment and provide tailor-made services that are adapted to their specific needs.

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Introduction

Globally, the number of people who inject drugs (PWID) is approximately 16 million, of whom 3 million are estimated to be HIV-infected (Mathers et al., 2008). Statistics for females who inject drugs (FWID) are scarce, but a recently published meta-analysis (Des Jarlais, Feelemyer, Modi, Arasteh, & Hagan, 2012; Des Jarlais, Feelemyer, Modi, Arasteh, Mathers, et al., 2012) of 135 studies with data collected between 1982 and 2009, including over 125,000 PWID from four continents (excluding Africa and Oceania) had an overall proportion of 21.5% women, which would correspond to approximately 3.5 million FWID globally. The analysis revealed variation in the female:male odds ratios for HIV prevalence but overall there was a modest but significantly higher HIV prevalence among females with an overall odds ratio of 1.18. FWID had higher rates of infection than MWID in Eastern Europe (33.0% vs. 27.9%), Western Europe (42.8% vs. 40.3%), Latin America (38.5% vs. 34.6%) and North America (34.5% vs. 31.3%). A similar review from Central Asia, on data collected between 2002 and 2012, showed that FWID in Russia, Kazakhstan, Uzbekistan and Tajikistan also had higher HIV prevalence; 10.1% compared to 9.5% among MWID.

Non-injection drug use e.g. cocaine/crack, heroin, amphetamine-type stimulants (ATS), that are administered by snorting, smoking, inhaling, ingesting, and rectal insertion, are more common worldwide than injection drug use (Shoptaw et al., 2013). Available global estimates on the numbers of ATS and cocaine users show high burden (Degenhardt & Hall, 2012) and ATS use appears to be rising in many countries including some in South America, East and South East Asia (Dargan & Wood, 2012). HIV prevalence is also high among persons who use non-injection drugs (Strathdee & Stockman, 2010) and studies in New York City have shown that HIV prevalence among injecting and non-injecting heroin and cocaine users were similar (Des Jarlais et al., 2007). The principal risk for HIV transmission among non-injection substance users is from high risk sexual behaviours and both cocaine and ATS can increase sexual arousal and promote risky sex (El-Bassel, Shaw, Dasgupta, & Strathdee, 2014a; Shoptaw et al., 2013; Strathdee & Stockman, 2010). In women, non-injection drug use has been associated with high risk sexual behaviours including multiple concurrent partners (Adimora, Schoenbach, Taylor, Khan, & Schwartz, 2011) and not using condoms (Wechsberg et al., 2010).

Women who use drugs, irrespective of whether these are injected or not, are faced with multiple issues which enhance their vulnerability to HIV; these include concomitant sex work, sexually transmitted infections (STIs), viral hepatitis, mental health problems, reproductive health issues, child care, stigma, violence and

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lack of access to health services including for HIV prevention, care and treatment. In this commentary, we will provide an overview on some of these issues particularly those related to sex work, relationships with intimate partners, STIs, Hepatitis C, stigma and violence, reproductive health and child care, and availability and access to HIV prevention, care and treatment services.

Women, drug use and sex work

Many women are driven to sell sex to support their own or their partner's drug use, which can put them at dual risk of HIV infection: through unsafe sex as well as unsafe injections. Overlap between sex work and injecting drug use is especially high in parts of Eastern Europe and Central Asia and is a growing concern in some Latin American countries, such as Mexico (El-Bassel et al., 2014a; Morris et al., 2013). Women engaging in both the sex trade and use of illicit drugs are more likely to share needles/syringes and other injection paraphernalia among themselves and their clients, have unprotected sex with their clients as well as their intimate partners, have higher rates of STIs and they are also more likely to experience sexual violence and incarceration (Azim et al., 2006; Des Jarlais, Feelemyer, Modi, Arasteh, & Hagan, 2012; Des Jarlais, Feelemyer, Modi, Arasteh, Mathers, et al., 2012; El-Bassel, Shaw, Dasgupta, & Strathdee, 2014b). FWID-sex workers (FWID-SW) are more likely than sex workers who do not use drugs to engage in street-level sex work, which is associated with higher levels of violence and high-risk sex due to a different type of clientele and lack of safe places to take clients (Deering et al., 2013). However, sex work can also provide economic freedom for women. A study in Tanzania revealed that females using drugs who also sold sex were more likely to purchase and use drugs alone than males (Asher, Hahn, Couture, Maher, & Page, 2013; Williams et al., 2007). In general however, the combination of multiple high-risk behaviours, vulnerabilities and discrimination associated with FWID-SW has led to high HIV prevalence among this sub-population. Examples include:

- In Central Asia FWID-SW are up to 20 times more likely to acquire the infection compared to FSW who do not inject drugs (Baral et al., 2013).
- Along the US-Mexican border, HIV prevalence among FWID-SW is 12.3%, nearly 3 times higher compared to other FSW (Strathdee et al., 2008).
- In Tanzania, 85% of FWID are sex workers and their HIV prevalence is 62%, compared to 28% among MWID (Lambdin et al., 2013).
- In Nepal, over 50% of FWID sell sex and their HIV prevalence is 33%, compared to 6.3% among MWID (Ghimire, Suguimoto, Zamani, Ono-Kihara, & Kihara, 2013).

Since FWID-SW are at high risk of becoming infected with HIV through unprotected sexual intercourse and sharing injection equipment with intimate partners, clients and peers, this subgroup meets the criteria for a 'bridge' population that is associated with the transition from concentrated to generalized HIV epidemics (Des Jarlais, Feelemyer, Modi, Arasteh, Mathers, et al., 2012).

Women with intimate partners who inject drugs

FWID are more likely to have MWID as sex partners (El-Bassel et al., 2014a). Women's relationships with their intimate male partners who also use drugs are complicated and dynamic. Generally these women work to sustain their own as well as their partner's drug habits. A study on women using drugs and selling sex in Canada (Shannon et al., 2008) found that men take control of women's lives through a process of building trust, supplying and

controlling the supply of drugs, gaining control of their sex work environment and transactions with their clients. Violence – both physical and sexual – is common and the experience of and the threat of violence serves to marginalize women further. Moreover, the intimate partner often controls decisions on condom use (Des Jarlais, Feelemyer, Modi, Arasteh, Mathers, et al., 2012), and lower rates of condom use have been reported by women who use drugs with both clients and their intimate partners (El-Bassel et al., 2014a).

On the other hand, these relationships are also emotional and women rely on their intimate partners for companionship as well as for support to negotiate with clients and law enforcement. A qualitative study conducted among drug using couples revealed the complex relationships and the role that emotional considerations play such that in one case the woman was initiated into injecting drugs by her intimate partner on her insistence as she wanted to be able to better share and understand his life (Simmons, Rajan, & McMahon, 2012).

Non-drug using women who are partners of MWID are also vulnerable to HIV as unprotected sex with intimate partners is common. Transmission of HIV to non-injecting wives of MWID has been documented in Manipur (Panda et al., 2000). In many cases, the female partner cannot change risky practices with her partner by herself, but harm reduction interventions aimed at couples can successfully decrease drug use and needle sharing and increase the use of condoms among drug-using couples (El-Bassel et al., 2014b). In addition, couple-based approaches often have positive effects on sexual communication skills and balancing power within the relationship (Roberts, Mathers, & Degenhardt, 2010). Evidence from a harm reduction program in Vietnam shows that reaching out to female partners of MWID is possible and may be effective in promoting condom use by the couple (Hammett et al., 2012).

Stigma, discrimination and violence

FWID are more stigmatized and discriminated against than their male counterparts as reported from several countries (El-Bassel et al., 2014a). Stigma is prevalent through all strata of society starting with their own families, friends and neighbours to service providers and law enforcement. In Bangladesh, a woman who uses drugs said "when I visit any house they assume I am a thief" (UNODC, icddr, & 2010) and a similar opinion was expressed in a study conducted in Georgia – "they (women who use drugs) are liars, big liars . . . and they are ready to go as far as possible. . . they are ready to sell themselves. . ." (Otiashvili et al., 2013). In the same study from Georgia, the attitude of law enforcement was reflected in the statement "Generally the attitude of police towards a drug user is similar to their attitude towards criminals and not sick people. . . their attitude towards women is even worse than to men. . ." The views held by society cause women who use drugs to suffer from extremely low esteem, feelings of guilt and self-blame.

Violence is commonly experienced by FWID (Braitstein et al., 2003) from their intimate partners and in the case of FWID-SW from their clients as well (Morris et al., 2013). There is a direct correlation between violence and increased HIV vulnerability as data show that women who have experienced intimate partner violence are less likely to use condoms and more likely to share needles, to have multiple sexual partners and to trade sex (Braitstein et al., 2003; Gilchrist, Blazquez, & Torrens, 2011). Women also report high rates of sexual violence from police and law enforcement agencies and experience high rates of incarceration. In some countries, the police confiscate condoms, sterile injection equipment and other paraphernalia thus compromising adoption of safe behaviours (El-Bassel et al., 2014a; UNODC & icddr, 2010). A sequelae of sexual violence is post-traumatic stress disorder which is common among women who use drugs (Braitstein et al., 2003).

Reproductive health care services and child care

Reproductive health services that cater to the needs of women who use different types of drugs is essential and these include pregnancy related services, birth control, advice on birth spacing and abortion services. Offering these services is a way to reach out to women who use drugs and integrating reproductive health services with harm reduction services or vice versa can reduce stigma.

For many women, pregnancy has been the main motivation to seek drug treatment services, and it was identified as a 'turning point' in their lives (Radcliffe, 2011) leading them to sometimes become drug free. In Bangladesh, relapse into drug use following drug treatment was more common among females than males; and women without children to support were more than three times likely to relapse (Maehira et al., 2013) which suggests that having children can be a strong motivating factor to reduce drugs. However, women who are identified as having a drug use problem, often have their children removed from under their care. In a study among mothers in opioid pharmacological treatment in Sydney, Australia many of the mothers interviewed said they had been reported prenatally by a hospital (Taplin & Mattick, 2014). Drug use during pregnancy is criminalized in some states in the US and in Russia and Ukraine laws allow abortion and termination of parental rights of drug using women (Pinkham & Malinowska-Sempruch, 2008). Such punitive policies can deter pregnant women and mothers from entering drug treatment and receiving services (El-Bassel, Terlikbaeva, & Pinkham, 2010).

Health care providers are often not trained to deal with the unique needs of women who use drugs and can have a hostile attitude towards the women which poses a significant deterrent for women to seek treatment (Simpson & McNulty, 2008). There is a need to recognise that pregnant women who use drugs and who seek help for their drug use are often motivated to act in the interests of their children and health care providers should be trained to offer them a range of opportunities both antenatally and postnatally (Marsh, D'Aunno, & Smith, 2000; Radcliffe, 2011). It is also an opportunity for providing prevention from mother to child transmission (PMTCT) of HIV so that children are born HIV free (El-Bassel et al., 2014a). More needs to be done to support these women around the issues that impact on their ability to parent and where children are under care of others, having contact with their children that is known to be helpful to all involved (Taplin & Mattick, 2014).

Co-infections and co-morbidities and the need for appropriate services

Persons who use drugs can often experience multiple infections and other conditions such as mental disorders. Diagnosis, availability of treatment and access for these conditions vary depending on the context including geography and gender. Examples of infections include STIs, viral hepatitis, and tuberculosis. STIs are not uncommon among women who use drugs (Azim et al., 2006; Guerrero & Cederbaum, 2011). Herpes simplex type 2 was found at particularly high levels in PWID in the US as well as the carcinogenic strains of human papilloma virus (HPV16 and 18) (Belani et al., 2012). However, services provided for STI diagnosis and management falls short of the need (Guerrero & Cederbaum, 2011). Hepatitis C virus (HCV) infection is common among PWID (Bruggmann & Grebeley, 2014; Nelson et al., 2011) and treatment is not widely available (Altice, Kamarulzaman, Soriano, Schechter, & Friedland, 2010). An analysis of data among PWID attending the Australian Needle and Syringe Programs between 1999 and 2011 where treatment was available for HCV, showed that uptake of treatment was significantly lower in FWID than MWID (Iversen

et al., 2014). Tuberculosis is also prevalent among PWID especially among those who are HIV positive (Belani et al., 2012) but gender disaggregated data are not available.

People who use drugs are at higher risk of depression, anxiety, and severe mental illness, including attempted suicide compared with those who do not use illicit drugs (Belani et al., 2012; Degenhardt & Hall, 2012). The prevalence of depression among heroin smokers has been found to be higher in females than males (Sordo et al., 2012).

Addressing these multiple co-infections and co-morbidities is best done in an integrated manner. In the UK, a national mental health strategy emphasises the need for integrated care to enable diagnosis and management of the co-morbidities of drug use and mental illness in women (Simpson & McNulty, 2008). Similarly in the US, the guidance proposed by the Centers of Disease Control and Prevention recommends that uptake of services will be enhanced if they are provided in a single site (Belani et al., 2012). The guidance also recommends that health care professionals are trained to recognise, manage and treat conditions in a culturally and gender sensitive manner.

Behavioural and structural interventions

Several interventions designed specifically for women using drugs have been implemented involving drug treatment along with education, counselling, reproductive health services, child care, female only drop in centres in different countries including Bangladesh, Canada, Russia, Ukraine, US (Pinkham, Stoicescu, & Myers, 2012; UNODC, 2013). Most of these services have not been validated by formal research but reports from the programs suggest that they have been successful in increasing the number of women accessing health services. However a few studies have been conducted and two examples are provided below:

A randomized trial was conducted in the US to test effectiveness of HIV/STI safer sex skills building (SSB) groups for women in community drug treatment vs. standard HIV/STI Education (HE) (Tross et al., 2008). The SSB consisted of five 90-min group sessions using problem-solving and skills rehearsal to increase HIV/STI risk awareness, condom use and partner negotiation skills. In HE, one 60-min group covered HIV/STI disease, testing, treatment, and prevention information. The SSB resulted in significant improvement in safer sex practices that were maintained over a longer duration compared to the HE group.

Behavioural interventions combining motivational techniques were used to assess whether both safer sex and safer injection taking practices could be promoted among FWID-SW. Two brief 30-min theory-based interventions based on motivational interviewing were found to reduce both injection and sexual risks among FWID-SW in two Mexico-US border cities (Strathdee et al., 2013). The results showed that FWID-SW can reduce sexual risks if given the right information and negotiation skills. The injection risk intervention has value in settings with sub-optimal syringe access but sterile needle-syringe coverage is essential.

A review on behavioural strategies to reduce injecting and sexual risk suggested that brief, standard, educational approaches may be more cost-effective than widespread use of formal multisession psychosocial interventions (Meader, Li, Des Jarlais, & Pilling, 2010).

HIV prevention and harm reduction for women who use drugs

Comprehensive packages for HIV prevention in people who use drugs as recommended by WHO, UNODC and UNAIDS consists of nine interventions including oral substitution therapy (OST), needle and syringe programs (NSPs), condoms and HIV testing

and treatment (World Health Organization, 2012). Modelling has shown that simultaneous scale-up of NSPs, HIV testing, OST and antiretroviral treatment (ART) can reduce HIV incidence by up to 63% (Degenhardt et al., 2010). But despite the global commitment of universal access to HIV prevention, testing, treatment and care people who use drugs, especially women, are less likely to utilize these services (Malta, Ralil da Costa, & Bastos, 2014). Women who use drugs, just like any other person, want to lead healthy lives, but they are constrained in accessing services by social and structural factors including prejudiced health professionals, lack of gender appropriate services, costs, unsafe/indiscrete locations, fear of losing their children and partner violence (Olsen, Banwell, Dance, & Maher, 2012; Roberts et al., 2010). Structural interventions are therefore required to ensure benefits from the combination of services recommended (Strathdee et al., 2010).

With the recent interest and attention on biomedical prevention, female condoms have dropped out of the radar as an effective prevention technology. Female condoms, similar to male condoms, are not only effective for HIV prevention but also for birth control. Unfortunately they have not been used widely although it was found to be acceptable to many women and one of the factors that prevented the wide scale use of female condoms was cost but studies in Brazil, South Africa, and Washington, DC suggest that expanded distribution would be cost effective in preventing HIV infection in those settings (Adimora et al., 2013). Another factor is lack of knowledge on how to use female condoms on the part of healthcare providers who therefore do not promote this method (Mantell et al., 2011).

It is recommended that people who use drugs be tested for HIV annually (McNairy & El-Sadr, 2014) to enable early detection of infection. For this to happen it is recognised that HIV testing and counselling needs to be reconceptualised, simplified and normalised (Sidibé, Zuniga, & Montaner, 2014). The development of quick and reliable tests which can be used outside traditional health facilities has the potential to greatly increase coverage among FWID and other populations who are reluctant to visit health care facilities. Community-based testing has been successfully used in both high- and low resource settings, and reached uptakes as high as 99.7% among FSW and 94.5% for PWID, with good linkage to treatment and care (Suthar et al., 2013). Outreach services for FWID should be expanded to include point-of-care testing, with referral to appropriate care for those who are positive.

Pre-exposure prophylaxis (PrEP) with antiretroviral drugs used by uninfected people can protect them from becoming infected. Daily oral tenofovir has recently been shown to halve the number of new HIV-infections among PWID in Bangkok over a five year period, with even more pronounced effects (79%) in FWID due to better adherence (Choopanya et al., 2013). However, there are many issues related to PrEP which need to be considered before PrEP can become a reality especially among marginalised and stigmatised populations such as PWID and more so among women who use drugs. These issues have been presented in a consensus statement formulated by a group of organizations and advocates, the Community Consensus Statement on the Use of Antiretroviral Therapy in Preventing HIV Transmission, that outlines a set of principles for the provision of PrEP (available at www.hivt4p.org) (Cairns, Baker, Dedes, Zakowicz, & West, 2014). A key issue highlighted in the consensus statement is the involvement of communities in conducting research and providing services and within a human rights framework.

It is now well established that effective ART minimizes the risk of further transmission of HIV by greatly reducing the number of free virus in the body. And for this reason WHO in its June 2013 ART guidelines recommends the use of treatment as a prevention method for people who are at increased risk of transmitting the infection, such as PWID and sex workers, as well as for couples

where only one partner is infected. However, PWID are less likely than other patients with HIV infection to receive ART (Wolfe, Carrieri, & Shepard, 2010). Adherence to the ART regimen has been a key concern in people who use drugs (Altice et al., 2010; Binford, Kahana, & Altice, 2012). However, studies have shown that adherence to ART among HIV positive PWID is possible and a recent review of the international literature demonstrated that greater adherence can be achieved if ART is provided in structured settings such as with OST (Malta, Magnanini, Strathdee, & Bastos, 2010).

Thus the continuum of care and treatment for women who use drugs starting from early detection of HIV through acceptable testing strategies, using ART for prevention and treatment and assuring adherence requires a multifaceted approach with involvement of the communities for best results.

Conclusions

Women who inject drugs often have higher rates of HIV than males using drugs which is because of the dual risk from unsafe injection practices and unprotected sex. Sex work is common among FWID, and FWID-SW are more likely to share needles/syringes and other injection paraphernalia, have unprotected sex with their clients as well as their intimate partners and have higher rates of STIs. For this reason, harm reduction should be included in all interventions for sex workers and services for safer sex should be part of all harm reduction programs for women who use drugs. The comprehensive package of harm reduction services needs to be made available with inclusion of reproductive health services.

Women are often reliant on their male partners for buying drugs and may require help in injecting. In the case of FWID-SW, men often control their clients. Such reliance on men, allow men control over their lives. Interventions must focus on strengthening the ability of women to achieve autonomy over HIV risk reduction practices, including freedom from pimps and police harassment and availability of safe places to take clients. Targeted interventions to empower women so that they are better able to seek and utilize services work and need to be adopted widely. Female condoms need to be made available and costs reduced.

As FWID are more stigmatized than their male counterparts, this can be a barrier for seeking services whether this is for harm reduction or drug treatment. Therefore, all health care personnel should be trained to provide a supportive, culturally sensitive and non-judgmental environment. Integration of harm reduction with reproductive health services as well as other services for the management of co-infections and co-morbidities must be considered. Child care service for women who use drugs can help promote adoption of safer behaviours and laws allowing forced abortions or removal of children from the care of mothers who take drugs must be removed. PMTCT services for pregnant drug using women must be made widely available.

Women who are sex partners of MWID but do not inject drugs themselves are vulnerable to HIV infection through their partners risk behaviours as condom use with intimate partners is very low. Couple-based interventions are effective for decreasing drug use and HIV risk behaviours. In addition, biomedical interventions such as ART and PrEP should be provided to women who use drugs and are affected and infected by HIV. More research on PrEP in women who use drugs are warranted to understand how to overcome barriers and special efforts that allow adherence to ART need to be undertaken with the involvement of communities. Furthermore, there is need for greater access to HIV testing that is acceptable to women in different settings.

The contents and conclusions of this paper reflect a broad consensus among social and clinical scientists participating in a UNODC

Scientific Consultation on HIV/AIDS (UNODC, Scientific Statement, March 11, 2014).

Conclusion Statements:

- Women who inject drugs often have higher rates of HIV than males using drugs. This is because of the dual risk from unsafe injection practices and unprotected sex. Since sex work is common among females who inject drugs (FWID), harm reduction should be included in all interventions for sex workers and safer sex messages should be part of all harm reduction programs for FWID.
- Women who use drugs and sell sex are more likely to share needles/syringes and other injection paraphernalia, have unprotected sex with their clients as well as their intimate partners, have higher rates of STIs and they are also more likely to experience sexual and physical violence and incarceration.
- Women are often reliant on their male partners for buying drugs and they also require help in injecting. In the case of those women who also trade sex, men often control their clients. Such reliance on men, allow men control over their lives. Interventions must focus on strengthening the ability of women to achieve autonomy over HIV risk reduction practices, including freedom from pimps and police harassment and availability of safe places to take clients.
- Women who use drugs are more stigmatized than their male counterparts and this can be a barrier for seeking services whether this is for harm reduction or drug treatment. Targeted interventions to empower women so that they are better able to seek and utilize services work and need to be adopted widely. In addition, training of health and social workers to recognize signs of injecting drug use and offer referral to appropriate services can increase service uptake.
- Services must be tailored for the needs of female drug users and include specialized care and support for pregnant women and women with children. This can be achieved through mobile services, home visits or female-only drop-in centres. All personnel should be trained to provide a supportive, culturally sensitive and non-judgmental environment. Integration of harm reduction with reproductive health services may be considered.
- Women who are sex partners of MWID but do not inject drugs themselves are vulnerable to HIV infection through their partners risk behaviours as condom use with intimate partners is very low. Couple-based interventions are effective for decreasing drug use and HIV risk behaviours.
- Interventions targeted to women to enable them to seek services, receive services that are non-judgemental and tailored to their specific needs work should be initiated and expanded. In addition, biomedical interventions such as ART and PrEP are highly effective in reducing the incidence of HIV and should be provided to women who use drugs and are affected and infected by HIV.

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Conflict of interest statement

The authors have confirmed they have no potential conflicts of interest to declare.

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Commentary

Prevention, treatment and care of hepatitis C virus infection among people who inject drugs

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ABSTRACT

People who inject drugs (PWID) represent the core of the hepatitis C virus (HCV) epidemic in many countries. HCV transmission continues among PWID, despite evidence demonstrating that high coverage of combined harm reduction strategies, such as needle syringe programs (NSP) and opioid substitution treatment (OST), can be effective in reducing the risk of HCV transmission. Among infected individuals, HCV-related morbidity and mortality continues to grow and is accompanied by major public health, social and economic burdens. Despite the high prevalence of HCV infection, the proportion of PWID who have been tested, assessed and treated for HCV infection remains unacceptably low, related to systems-, provider- and patient-related barriers to care. This is despite compelling data demonstrating that with the appropriate programs, HCV treatment is safe and successful among PWID. The approaching era of interferon-free directly acting antiviral therapy has the potential to provide one of the great advances in clinical medicine. Simple, tolerable and highly effective therapy will likely address many of these barriers, thereby enhancing the numbers of PWID cured of HCV infection. However, the high cost of new HCV therapies will be a barrier to implementation in many settings. This paper highlights that restrictive national drug policy and law enforcement are key drivers of the HCV epidemic among PWID. This paper also calls for enhanced HCV treatment settings built on a foundation of both prevention (e.g. NSP and OST) and improved access to health care for PWID.

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Introduction

The hepatitis C virus (HCV) epidemic has been coined a “viral time bomb” by the World Health Organization. HCV is a prevalent chronic infection with potentially deadly consequences. Recent estimates suggest that globally, the HCV viremic (RNA positive) prevalence is forecasted at 1.1% (0.9–1.4%) corresponding to 80 (64–103) million viremic infections (Gower, Estes, Hindman, Razavi-Shaerer, & Razavi, 2014). Despite the looming public health threat that HCV imposes, it receives little public attention. This silent disease often progresses with few symptoms, even during advanced stages of disease. As a blood borne virus, the major route of transmission in most countries is injecting drug use. People who inject drugs (PWID) are heavily affected by this infectious disease. However, despite the high prevalence, ongoing transmission and increasing HCV-related disease burden among PWID, HCV

testing, prevention, assessment and treatment remain suboptimal in this group, and the time-bomb still ticks on. Over recent years, the development of simple, tolerable and highly effective interferon-free directly acting antiviral (DAA)-based therapies for HCV infection has brought great optimism to the sector. However, in order for the roll-out of these new IFN-free regimens to eliminate HCV among PWID, drastic changes and the breaking of some taboos will be required.

Transmission of HCV infection

Although risk factors commonly associated with transmission of HCV infection include blood transfusion from unscrutinized donors, unsafe therapeutic injections, and other health-care related procedures, the majority of new and existing infections in most countries have occurred as a result of injection drug use (Hajarizadeh, Grebely, & Dore, 2013). Among PWID, the major route of transmission is through the sharing of drug preparation and injection equipment (e.g. syringes, needles, filters, water and cookers) (Pouget, Hagan, & Des Jarlais, 2012). The hepatitis C virus is resilient and is capable of surviving on drug preparation equipment

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(e.g. needles, syringes, filters and water) for several days to weeks (Doerrbecker et al., 2013; Paintsil, He, Peters, Lindenbach, & Heimer, 2010). Also, the risk of HCV transmission is greater than for HIV infection, consistent with greater per contaminated injecting exposure transmission (2.5–5.0% for HCV vs. 0.5%–2.0% for HIV), and higher prevalence of HCV than HIV among PWID (and thus, risk of exposure) (Grebely & Dore, 2011a).

Epidemiology of HCV among PWID

Given an estimated global HCV prevalence of 67% among PWID (Nelson et al., 2011), around 10 million PWID have been infected with HCV, with an additional large reservoir of infection among former PWID. In some countries, the HCV prevalence is as high as 90% (Hagan, Pouget, Des Jarlais, & Lelutiu-Weinberger, 2008). In absolute numbers, the countries with the greatest number of HCV infected PWID include China (1.6 million), the United States (1.4 million) and the Russian Federation (1.3 million) (Nelson et al., 2011).

The estimated incidence of HCV infection among PWID ranges from 5% to 45% per annum (Grebely & Dore, 2011a; Hagan et al., 2008; Page, Morris, Hahn, Maher, & Prins, 2013). The risk of HCV infection is highest among younger individuals and recent initiates into injecting drug use (Grebely & Dore, 2011a; Page et al., 2013) (2, 3) (1, 2). However, many PWID remain unaware of their infection status. The absence of accurate national surveillance and notification systems also contributes to underreporting of HCV.

Morbidity and mortality among PWID

HCV is a major cause of liver failure and liver-related death (Grebely & Dore, 2014; Hajarizadeh et al., 2013). In the United States, HCV-related mortality has now surpassed death related to HIV (Ly et al., 2012). Globally, the burden of HCV infection is expected to substantially increase within the next few decades (Grebely & Dore, 2014; Hajarizadeh et al., 2013).

Given around 25% of people infected with HCV spontaneously clear virus (4), ~50% of PWID will have chronic HCV infection (represents 8 million PWID globally). In those with spontaneous HCV clearance, re-infection in the setting of ongoing HCV exposure is possible (Grebely et al., 2012). Although many of those with re-infection clear repeatedly, others develop persistent infection.

Development of chronic HCV infection may lead to progressive hepatic fibrosis, cirrhosis, and complications of liver failure or hepatocellular carcinoma (Grebely & Dore, 2011b). Progression to advanced liver disease is uncommon in the initial 10–20 years of infection, particularly among PWID who generally acquire infection at a younger age, but becomes more common with each subsequent decade of infection (Grebely & Dore, 2011b). Among PWID, factors contributing to fibrosis progression such as age, continued moderate-heavy alcohol use, and HIV are often compounded. Although younger individuals with HCV infection are at lower risk of HCV-related morbidity and mortality, and drug-related mortality is significant among PWID, the ageing cohort nature of PWID populations means that liver disease-related mortality is increasing (Grebely & Dore, 2011b, 2014). There is also increasing evidence that HCV infection is associated with an increase in both hepatic and extra-hepatic disease, including circulatory diseases, renal diseases, and neuropsychiatric disorders (Grebely & Dore, 2011b, 2014). However, HCV treatment can attenuate hepatitis C-related disease consequences, and prevent death associated with HCV (van der Meer et al., 2012).

Prevention of HCV infection among PWID

There is currently no HCV vaccine. But, HCV infection is a preventable disease, especially among PWID. Basic requirements for successful HCV prevention according to the WHO guidance are access to health care and justice, health literacy and need adapted services for PWID (World Health Organisation, 2012). Key measurements for effective HCV prevention are needle syringe programs (NSPs, including provision of sterile injection equipment) and opioid substitution treatment (OST) (Turner et al., 2011). With the combination of these two preventive steps at high coverage, those in need and at right scale the individual risk can be minimized (Hagan, Pouget, & Des Jarlais, 2011; Martin, Hickman, Hutchinson, Goldberg, & Vickerman, 2013; Turner et al., 2011). In many countries, the coverage of OST and sterile injection equipment provision is insufficient (Mathers et al., 2010). As Page and colleagues have highlighted, even in a country like the United States, “public health and political efforts to increase clean syringe/needle availability have been met with ideological, social, and political barriers, effectively thwarting the delivery of one of the most efficacious biomedical technologies for preventing injection-related infections” (Page et al., 2013).

Most prevention programs, if available at all, are driven by insights from the field of HIV prevention, where a lower coverage of needle and syringes is sufficient to stem HIV transmission compared to HCV (Grebely & Dore, 2011a). However, the higher infectivity of HCV compared to HIV and greater prevalence demands broader injecting equipment provision (cooker, filter, water), higher coverage and greater scale-up. The requirements for injecting equipment may vary by the type of drug used and the type of users (e.g. a heroin user needs up to 6 sets of injection equipment per day, while a “krokodil (desmorphine)” user may require 12 sets).

In an attempt to address the HCV epidemic and reduce prevalence of infection in the community, prevention measures such as NSP and OST may be coupled with HCV treatment (Martin, Vickerman, et al., 2013). It has been suggested that with even modest rates of HCV treatment uptake it will be possible to substantially reduce the viral reservoir in the community and decrease the number of potential sources for transmission, particularly in the era of IFN-free HCV therapy (Martin, Vickerman, et al., 2013). However, HCV treatment as prevention will require a strong foundation of harm reduction programs, such as NSP and OST programs to reduce ongoing transmission. As such, countries with low coverage of OST and sterile injection equipment provision should first concentrate on the scale-up these two important prevention strategies, given their importance in preventing HCV transmission (Hagan et al., 2011; Martin, Vickerman, et al., 2013; Turner et al., 2011; Vickerman, Martin, Turner, & Hickman, 2012). Successful HCV prevention strategies among PWID can also prevent HIV infection, given the similar routes of transmission, higher coverage and increased scale that are required. However, further research is needed to better understand the optimal combination of HCV prevention strategies for reducing HCV transmission.

Any combination of prevention strategies must take into account that the highest risk of HCV infection is at the beginning of an injecting career. As such, comprehensive prevention measures should ensure targeting to new initiates to injecting and young people who inject drugs (Page et al., 2013).

Access and provision of HCV prevention services is hindered in countries with restrictive drug law enforcement. The criminalization of drug use and the fear of arrest drives people away from HCV prevention services, resulting in increased risk behaviors and increased transmission of HCV infection. Restrictions in OST provision leads to low coverage, thereby limiting the potential effect on HCV prevention. In countries with repressive drug policy, PWID

often end up in prison, where the risk of HCV infection is often higher, given a high prevalence of HCV infection and the absence of effective prevention measures.

Treatment of HCV infection among PWID

Hepatitis C virus infection is a curable chronic disease. Although new DAA-based HCV therapies are already available in some countries, for most areas, the current standard of care consists of treatment with pegylated-interferon (one injection per week), ribavirin (1–3 tablets twice a day) and telaprevir or boceprevir (6–12 tablets, 2–3 times a day) for those with HCV genotype 1. These treatments are arduous (6–12 months), poorly tolerated and cure only 60–70% of individuals.

Initially, HCV treatment guidelines excluded PWID from consideration, citing concerns about adherence, increased susceptibility to side effects (e.g. depression) and re-infection (NIH, 1997). However, there is now compelling evidence that HCV treatment is safe and effective among PWID (Aspinall et al., 2013; Dimova et al., 2012). In two systematic reviews of studies assessing treatment for PWID (one specifically focusing on those with recent injecting at the time of treatment initiation), the overall proportion with viral cure was 56% (Aspinall et al., 2013; Dimova et al., 2012). These response rates are comparable to large randomized controlled trials of HCV treatment (Manns, Wedemeyer, & Cornberg, 2006). International guidelines now recommend treatment for PWID following individualised assessment (Robaey et al., 2013).

Although there is concern that HCV re-infection may negate the potential benefits of treatment, the reported rates of reinfection following successful HCV treatment among PWID are low (1–5% per year) (Aspinall et al., 2013). Treatment of HCV infection among current and former PWID has also been demonstrated to be cost-effective (Martin et al., 2012).

New therapies for the treatment of HCV infection

Numerous antiviral agents targeting specific HCV viral functions have been developed (direct acting antivirals [DAAs]) (5). Over the next 2–3 years several, interferon free combination DAA regimens should be licensed. These regimens offer increased efficacy (>90%), reduced toxicity, shortened treatment durations (8–12 weeks), simplified dosing (all oral, possibly once-daily regimens) and monitoring schedules. The availability of such regimens should markedly improve the feasibility of enhanced HCV treatment uptake and responses among PWID, further enhancing the prevention potential of HCV therapy, making elimination of HCV infection among PWID a possibility (Grebely & Dore, 2014; Martin, Vickerman, et al., 2013).

Models of care for the treatment of HCV infection among PWID

Traditionally, the provision of HCV care and treatment has been provided at hospital-based specialist services (Bruggmann, 2012). This setting is often not suitable for PWID, given the risk of stigmatization, exclusion due to prejudices and the absence of expertise in addiction treatment (Bruggmann & Litwin, 2013). Furthermore, the limited infrastructure for delivery of HCV therapies and the lack of HCV knowledge in drug and alcohol clinics and primary care centres may limit the ability to provide treatment settings that are suitably adapted for the needs of this vulnerable population (Bruggmann, 2012). A multidisciplinary approach is the foundation of a need-adapted HCV care setting for PWID (Bruggmann & Litwin, 2013). Close collaboration of all involved health professionals is crucial for every model to be successful. To adopt a nonjudgmental attitude

toward PWID is essential for all parties involved. A high level of acceptance of the individual life circumstances of PWID rather than rigid exclusion criteria will determine the level of success of any model of hepatitis C management. Integrating HCV treatment in a primary care-based, multidisciplinary OST clinic has proven to be an efficient way to treat a poly-morbid population of PWID (Bruggmann & Litwin, 2013).

Barriers to the treatment of HCV infection among PWID

Despite the high prevalence of HCV infection, proven favourable HCV treatment responses, available guidelines recommending treatment among PWID, and high treatment willingness, treatment uptake remain as low as 1–2% per year, even in countries where treatment is available and affordable for everyone (Grebely & Dore, 2014). Further research is needed to better understand the best interventions to enhance HCV screening, assessment and treatment to reduce the burden of HCV infection among PWID.

Any attempt to avert the public health care threat posed by the looming burden of HCV among PWID will urgently require groundbreaking changes to alter the currently inefficient system for the care of HCV infection among this vulnerable population. A relevant scale-up of treatment among PWID is impossible without massively reducing the barriers to care. Low awareness (among patients, health care providers, policy makers, political leadership and general public), as well as low HCV literacy (among healthcare professionals and patients) and discrimination and stigmatization of drug use are all major barriers for PWID to access HCV care (Bruggmann, 2012; Paterson, Hirsch, & Andres, 2013). Many of those barriers are a result of the criminalization of drug use (The Global Commission on Drug Policy, 2013). Repressive drug policy is hindering effective public health measures for PWID and therefore fuelling the HCV and HIV epidemic in this population. De-penalization of drug use would therefore be an important step toward eliminating hepatitis C (Bruggmann, 2013).

Another major barrier to treatment for PWID is the price of medication. HCV treatment for both active and former PWID is cost-effective (driven by the prevention benefit among active PWID) (Martin et al., 2012; Martin, Vickerman, Miners, & Hickman, 2013). However, the cost of today's standard-of-care HCV treatment is prohibitively expensive for middle- and low-income countries. Even in Western European countries, access to current therapies is restricted because of the exorbitant cost of the medication. High tolerability of those regimens will bring the potential of high applicability. But, their extortionate cost will exceed even the healthcare budgets of rich countries. Offering HCV treatment at affordable prices is crucial in the fight of the global HCV crisis (Bruggmann, 2013).

It is uncertain whether HCV treatment for PWID will be cost-effective, particularly in the initial era of DAA-based therapy. Newer, more effective regimens will undoubtedly come at an increased cost. Price reform and enhanced access to therapy for those with HCV infection will require considerable public health advocacy from all sectors in the HCV community, including community organizations representing PWID. The involvement of several pharmaceutical companies in development of DAA-based therapy may enable more competitive drug pricing in high-income countries. In low- and middle-income countries, production of generic DAA regimens will be required, similar to antiretroviral therapy for HIV.

Ultimately, markedly enhanced global public health advocacy and investment along the lines of the Global Fund for HIV, tuberculosis and malaria, will be required to enable broadened access to highly effective HCV therapy, including for PWID.

HCV infection is widely ignored politically, resulting in low attention, resources and commitment. Political efforts to improve prevention and access to care and to secure affordable treatment lag far behind those of HIV. With the availability of novel, highly efficacious HCV therapies, the elimination of HCV among PWID is now feasible. At this moment, evidence-based harm reduction measures and specific care elements need to be optimized and expanded in order to efficiently prevent the further spread and secondary liver disease burden of HCV and to halt the growing individual, social and economic harm of the epidemic.

Conclusion

HCV infection is highly prevalent among PWID. Globally, 67% of PWID are HCV positive.

Awareness is low among policy makers, political leadership and general public, particularly in the regions most affected by the HCV epidemic among PWID. Despite this, the public health threat is considerable and will manifest itself in the next five years.

Overall, only 10–50% of all PWID worldwide receive HCV testing, less than 10% have access to assessment and treatment of the disease, despite the evidence that treatment is effective. Restrictive drug policy and law enforcement are key drivers of the HCV epidemic among PWID, in even greater magnitude than of HIV, as HCV is more contagious and 3.5 times more prevalent. Successful HCV prevention strategies combine high coverage of harm reduction measures with HCV treatment provision at the right scale. The integration of needs-adapted HCV treatment services into harm reductions services like opioid substitution treatment has the potential to enhance therapy uptake and cure rates. Novel, well-tolerated, and efficacious interferon-free HCV treatment regimens administered once daily as a pill over 8–12 weeks bring along the potential to cure the majority of infected people who inject drugs. With these new medicines, the elimination of HCV among PWID becomes achievable. The contents and conclusions of the paper reflect a broad consensus among social and clinical scientists participating in a UNODC Scientific Consultation on HIV/AIDS (UNODC, 2014).

Conclusion Statements:

- HCV prevalence is high among PWID. Globally, 67% of PWID are HCV positive.
- The public health threat by the HCV epidemic is considerable and will continuously increase in the next years. Still, Hepatitis C awareness is generally low, even among health care providers and health ministries, particularly in the regions most affected by the HCV epidemic among PWID.
- Access to testing, assessment and treatment for PWID is poor, despite the evidence that treatment is effective.
- The HCV epidemic among PWID is relevantly driven by restrictive drug policy and law enforcement.
- HCV can be prevented by a combination of high coverage of harm reduction measures with HCV treatment provision at the right scale.
- Treatment uptake and cure rates can be enhanced by the provision of HCV care integrated into harm reductions services like opioid substitution treatment.
- New interferon-free HCV treatment regimens have the potential to cure the majority of infected people who inject drugs. With these well tolerated and easy to administer medicines, the elimination of HCV among PWID becomes achievable.

Conflict of interest statement

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Commentary

HIV, drugs and the legal environment

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ABSTRACT

A large body of scientific evidence indicates that policies based solely on law enforcement without taking into account public health and human rights considerations increase the health risks of people who inject drugs (PWIDs) and their communities. Although formal laws are an important component of the legal environment supporting harm reduction, it is the enforcement of the law that affects PWIDs' behavior and attitudes most acutely. This commentary focuses primarily on drug policies and policing practices that increase PWIDs' risk of acquiring HIV and viral hepatitis, and avenues for intervention. Policy and legal reforms that promote public health over the criminalization of drug use and PWID are urgently needed. This should include alternative regulatory frameworks for illicit drug possession and use. Changing legal norms and improving law enforcement responses to drug-related harms requires partnerships that are broader than the necessary bridges between criminal justice and public health sectors. HIV prevention efforts must partner with wider initiatives that seek to improve police professionalism, accountability, and transparency and boost the rule of law. Public health and criminal justice professionals can work synergistically to shift the legal environment away from one that exacerbates HIV risks to one that promotes safe and healthy communities.

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Introduction

When asked why they shared a syringe, a common response from people who inject drugs (PWIDs) is “I had no choice.” Sharing syringes and other injection paraphernalia, which increase the risk of acquiring HIV and viral hepatitis are behaviors that do not occur in a vacuum. These and other risk behaviors are shaped by factors at macro, meso and micro level of the physical, social, legal and policy environment (Rhodes, Singer, Bourgois, Friedman, & Strathdee, 2005) that affect PWIDs' access to syringes and addiction treatment. In this commentary, we discuss factors in the macro and micro-legal environment that are known to increase transmission of HIV and viral hepatitis among PWIDs, as well as structural interventions that can be used to prevent these infections.

There is now a large body of empirical evidence demonstrating that formal laws and policies are critical aspects of the environment influencing HIV risks among PWID. At the macro-level, most countries have laws and policies that dictate whether drug possession and use are punishable by law and to what extent. In response to numerous and consistent indicators that the ‘war on

drugs’ is ineffective (Beyrer et al., 2010; Reuter, 2009; Wood et al., 2010; Wood, Werb, Marshall, Montaner, & Kerr, 2009), including unchanging availability and use of drugs and various severe health-related harms (Werb et al., 2013), at least 30 countries are reforming drug policies to align them more closely with public health goals (Cozac, 2009; Hughes & Stevens, 2007; Moreno, Lincea, & Ajenjo, 2010), and even some U.S. states. On the other hand, harsh penalty-based drug policies remain in place in many other countries, and in some cases have been strengthened of late. In twelve countries, legislation allows judicial corporal punishment for drug and alcohol offences (e.g., death penalty), which is a violation of international law (IHRA, 2011). Some countries maintain compulsory ‘drug detention’ programmes (Global Commission on Drugs, 2012; HIV and the Law, 2012) which often operate as forced labor or military training camps, and where evidence-based addiction treatment is entirely absent. These punitive policies have been associated with elevated risk behaviors and detrimental health outcomes among PWID (Degenhardt et al., 2010). Human rights elements of these policies (Wolfe & Cohen, 2010) are addressed in the thematic paper by Kamarulzaman and colleagues in this issue.

In 2009, the World Health Organization, UNODC and UNAIDS identified nine HIV interventions as scientifically proven, essential components of a combination package to prevent HIV among PWID. These include provision of sterile syringe access through

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needle and syringe programmes (NSPs), opioid substitution treatment (OST; i.e., methadone and buprenorphine maintenance), HIV counseling and testing, ART, prevention and treatment of sexually transmitted infections (STIs), condom distribution programmes, information and education campaigns, vaccination and treatment of viral hepatitis, and prevention and treatment of tuberculosis (World Health Organization, 2009). NSP and OST can also reduce the risk of acquiring viral hepatitis (i.e., Hepatitis B and C). Yet at the meso- or community level, laws and policies exist surrounding syringe purchase and possession, including over-the-counter sales and authorization of needle/syringe programmes (NSPs). Laws and policies also govern access to addiction treatment, including OST and treatment diversion. Such laws vary by country, state and sometimes between or even within cities. For example, despite a plethora of evidence demonstrating effectiveness and cost-effectiveness, and the fact that methadone is on the WHO Essential Drugs List, OST is widely unavailable in most Eastern European countries. At least due in part to these kinds of laws and policies, coverage of NSP and OST worldwide is exceedingly low (Mathers et al., 2010). The UNODC has explicitly clarified that harm reduction policies, including OST are fully consistent with international drug control conventions (UNODC, 2014a). Yet, despite an established international consensus about best practices, some policy decisions about harm reduction interventions to PWID continue to be driven by moral concerns rather than empirical evidence (Strathdee, Shoptaw, Dyer, Quan, & Aramrattena, 2012).

At the micro-level (within communities), policing practices directly influence the behavior, perceptions, and health outcomes among PWIDs. Such practices include arrests for drug/syringe possession, confiscation of syringes, conducting surveillance at NSPs and OST clinics (Hayashi, Small, Csete, Hattirat, & Kerr, 2013), and random urine drug screening (Beletsky, Lozada, et al., 2013; Bluthenthal, Lorvick, Kral, Erringer, & Kahn, 1999; Hammett, Bartlett, & Chen, 2005; Pollini et al., 2008; Shannon et al., 2008; Small, Kerr, Charette, Schechter, & Spittal, 2006; Strathdee et al., 2011). While police sometimes engage in these behaviors in accordance with formal laws, research indicates that 'laws on the books' do not necessarily correspond to 'laws on the streets' (Burriss et al., 2004). In other words, police conduct within community settings are often not consistent with established laws and policy, and often undermine health and human rights. Drug policy reforms can create even wider gaps if police are not informed about public health reforms authorizing harm reduction programmes, and/or if they oppose them (Banta-Green, Beletsky, Schoeppe, Coffin, & Kuzler, 2013; Beletsky, Macalino, & Burriss, 2005). Although formal laws are an important component of the legal environment supporting harm reduction, it is the enforcement of the law that affects PWIDs' behavior and attitudes most acutely. This paper will focus primarily on drug policies and policing practices that increase PWIDs' risk of acquiring HIV and viral hepatitis, and avenues for intervention. We also refer briefly to policing practices that influence HIV risk among sex workers that inject drugs who are an especially vulnerable subgroup (Rusakova, Rakhmetova, & Strathdee, 2014).

Drug-related laws and policies that influence HIV risk behaviors

The harms flowing from current legal and policy frameworks that criminalize drug use and drug users have been well described, and include various direct and indirect health-related harms, mass incarceration of drug users, stigma against drug users within society, and human rights violations (Global Commission on Drugs, 2012; HIV and the Law, 2012). A growing body of evidence has also revealed that the dominant approach to drug control, which focuses

on reducing the supply and use of drugs, has failed to achieve its basic objectives (Beyrer et al., 2010; Werb et al., 2013; Wood et al., 2010). Importantly, in many settings that have employed aggressive drug control measures, the availability and purity of drugs has increased, while the price of drugs has remained stable or declined (Werb et al., 2013). These dynamics have often been accompanied by high rates of continued drug use. In contrast, drug use is lower in some settings that have employed alternative regulatory frameworks for responding to drug-related harms. A recent review of evidence derived from the WHO World Mental Health Survey concluded that "(t)he US, which has been driving much of the world's drug research and drug policy agenda, stands out with higher levels of use of alcohol, cocaine, and cannabis, despite punitive illegal drug policies. . . The Netherlands, with a less criminally punitive approach to cannabis use than the US, has experienced lower levels of use, particularly among younger adults" (Degenhardt et al., 2008).

Given the known harms and limitations associated with conventional drug control laws, a growing number of countries have begun experimenting with alternative regulatory frameworks. In most instances this has involved the de-penalization of drug possession for personal use, use of fines for possessing small amounts of drugs, legalization of some illicit drugs, and the use of referral to treatment instead of arrest and incarceration (Cozac, 2009; Hughes & Stevens, 2007; Moreno et al., 2010). To clarify the status of these reforms under international law, UNODC has recently restated its position that de-penalization and harm reduction policies are fully consistent with the Single Convention and its progeny (UNODC, 2014a). While some evidence of benefit of such reforms has been documented, there is still a need for ongoing evaluation of such approaches, given their potential to offset the harms associated with conventional drug control measures.

Policing practices and HIV risk

Laws and policies can be critical to facilitating harm reduction and public health prevention, but the practices of police and other government actors serve as the critical link to policy implementation on the ground. International research has consistently shown that law enforcement practices have both direct and indirect effects on behaviors that increase PWIDs' risk of acquiring HIV and viral hepatitis (Beletsky, Lozada, et al., 2013; Bluthenthal et al., 1999; Hammett et al., 2005; Pollini et al., 2008; Shannon et al., 2008; Small et al., 2006; Strathdee et al., 2011). Policing practices that *directly* influence PWIDs' risk of acquiring blood borne infection include syringe confiscation and arrests. By confiscating syringes, PWIDs resort to buying, renting or loaning someone else's used syringe, or using discarded syringes. In a variety of settings, police have charged PWIDs participating in harm reduction programmes with drug possession based solely on drug residue in a used syringe, or charged PWIDs for carrying drug paraphernalia. These arrest practices have been reported even in the absence of laws that prohibit syringe purchase and possession. In Mexico, where it is legal to purchase syringes at pharmacies without a prescription and there are no drug paraphernalia laws, over half of PWIDs in Tijuana and Ciudad Juarez reported that police confiscated their sterile and used syringes in the prior 6 months, which was associated with a 3-fold higher risk of syringe sharing (Pollini et al., 2008). Syringe confiscation was independently associated with HIV infection among female sex workers who inject drugs (Strathdee et al., 2011). Fear of police discourages PWIDs from carrying syringes, even for the purpose of syringe exchange, pressures them to inject hurriedly in the street or inject in shooting galleries where needles are rented or sold. In a study undertaken in Bangkok, 67% of PWID had been subjected to random urine testing, and those had been tested in this

way were more likely to report avoiding healthcare and were less likely to access voluntary addiction treatment (Hayashi, Ti, Buxton, et al., 2013). The aforementioned practices further increase the risk of needle sharing and transmission of HIV and other blood borne infections and have been also associated with higher overdose mortality (Bohnert et al., 2011).

Policing can also *indirectly* increase transmission of HIV and blood-borne infections, for example by conducting 'police sweeps/crackdowns' and random urine drug screens or by conducting surveillance and arresting PWIDs who attend NSPs or OST programmes, thereby actively discouraging access to such programmes (Bluthenthal et al., 1999; Booth et al., 2013; Burriss et al., 2004; Cooper et al., 2012; Friedman et al., 2006; Global Commission on Drugs, 2012; Rhodes et al., 2003; Robertson et al., 2010; Ti et al., 2013; Werb et al., 2008; Wood et al., 2004). A survey of U.S. NSPs reported the following police interactions at least monthly: client harassment: 43%; confiscation of clients' syringes: 31%; client arrest: 12% (Beletsky et al., 2011). These practices can also displace PWID to areas with limited access to NSPs or OST. In Ukraine, HIV-infected PWID experienced frequent police detentions resulting in withdrawal symptoms, confiscation of syringes, and interruptions of essential medications, including ART and OST (Izenberg et al., 2013). In Mexico, the proximity of a TB clinic to the local police station was an important barrier to TB medication adherence since a high proportion of those with active TB were substance users with a criminal history (Guzman-Montes, Ovalles, & Laniado-Laborin, 2009). Ample evidence documents the heightened risks of HIV and other blood-borne and sexually transmitted infections that accompany incarceration, as discussed in a Thematic Paper by Dolan.

Most concerning are cases where police engage in 'extra-legal' behaviors that represent misconduct. This includes extorting bribes, soliciting sexual favors in lieu of arrest, planting drugs, forced withdrawal, or physical and sexual abuse. These behaviors represent human rights violations and are highly prevalent in some settings. In a recent U.S. study of female drug users experiencing police sexual misconduct, Cottler, O'Leary, Nickel, Reingle, and Isom (2013) found that 96% had sex with an officer on duty, 77% had repeated exchanges, 31% reported rape and 54% were offered favors by officers in exchange for sex; only half used condoms. In two Russian cities, 38% of FSWs reported being solicited for sex in the last year (Odinokova, Rusakova, Urada, Silverman, & Raj, 2013). In Thailand, 38% of PWID were beaten by police, which was associated with higher odds of syringe sharing and reduced access to healthcare (Hayashi, Ti, Csete, et al., 2013). In Odessa, Ukraine, HIV-infected PWID were more likely than HIV-uninfected PWID to report that police planted drugs on them or were threatened to inform on other drug users (Booth et al., 2013). It was estimated that if police beatings were eliminated in Odessa, HIV incidence among PWID would decrease by up to 19% due to the reduction in needle sharing that would subsequently occur (Strathdee et al., 2010).

Avenues for intervention

Since PWIDs' risk of needle sharing is largely dictated by factors outside of their personal control, it is insufficient and misguided to expect that the onus of responsibility for safer behaviors should rest solely on their shoulders (Rhodes et al., 2005; Strathdee et al., 2010). Given the evidence that current legal regimes cause more harm than good, it is imperative to reform international, national, and local laws and policies to reflect best practices that are shown to promote both health and safety. These best practices include promoting syringe access through pharmacy sales and NSPs, authorizing and providing free methadone and buprenorphine treatment, and shifting the approach to problematic drug use

away from incarceration and towards evidence-based treatment and case management.

There is a concomitant need, however, to ensure that those who are charged with enforcing the law are informed and encouraged to re-align their practices with public health. Mistrust and lack of clarity about syringe possession laws discourages PWID from volunteering syringes during police encounters, which increases risk of needle stick injuries and contributes to occupational stress, anxiety, and staff turnover. In a study of 803 police officers in San Diego, CA, 83% felt that on-duty NSI posed the same magnitude of risk as a gun-shot wound; 29.6% had experienced a NSI, of whom 27.7% had repeat exposures (Lorentz, Hill, & Samimi, 2000).

Police education programmes could serve as a critical structural intervention to harmonize law enforcement and public health in countries with high burdens of drug use and blood-borne infections. Studies by Beletsky et al. conducted in the U.S. and Kyrgyzstan indicate that police are receptive to content on harm reduction programming and changes in drug policies when 'bundled' with occupational safety messages that highlight their own risk of acquiring HIV and viral hepatitis through needle-stick injuries. Pilot training with 600 officers in the U.S. found that officers were generally receptive to the curriculum (Davis & Beletsky, 2009). Training led to better communication and collaboration between NSP and law enforcement. For example, baseline data from officers in Rhode Island confirmed anxiety about NSI, poor legal knowledge, and myths about NSPs. Before training, respondents believed that NSPs promote drug use (51%), *increase* NSI risk (58%), and fail to prevent HIV epidemics (38%). Pre-post evaluation suggested significant shifts in legal and occupational safety knowledge and changes in attitudes toward SEPs were promising (Beletsky et al., 2011).

In Kyrgyzstan, a police officer survey was conducted to assess knowledge and intended practices following legislation that prohibits police interference with harm reduction programmes (Beletsky et al., 2012). Of 319 officers, 79% understood key due process regulations, 71% correctly characterized laws on sex work and 54% understood syringe possession law, but only 44.4% reported familiarity with the new law. Most (73%) expressed positive attitudes toward condom distribution, while only 56% viewed syringe access favorably. Almost half (44%) agreed that police should refer vulnerable groups to harm prevention programmes but only 20% reported doing so. Beletsky, Thomas, Shumskaya, Artamonova, and Smelyanskaya (2013) subsequently offered training covering HIV prevention, policy, and occupational safety to cadets and active-duty police across Kyrgyzstan. Training was associated with greater intent to refer PWID to harm reduction programmes, expressing no intent to extra-judicially confiscate syringes, better understanding sex worker detention procedures and improved occupational safety knowledge (Beletsky, Thomas, et al., 2013).

Ensuring that law enforcement does not undermine the prevention of blood-borne infections is key, but police can also play an active role in promoting harm reduction, by referring PWID to NSP, OST, and supervised injection facilities (DeBeck et al., 2008). In Kyrgyzstan, the "Friendly Policemen" project provides incentives for officers to inform key populations about programmes like NSPs, drug treatment, and healthcare services. Building on empirical evidence that police officers already refer clients to harm reduction services and that many more are contemplating such collaborative efforts, the project also supports internal police champions who promote harm reduction and other public health approaches to their peers (Beletsky et al., 2012).

Despite these promising experiences, few countries have institutionalized harm reduction education as part of training for cadets or active duty police officers who interact with PWID. Efforts are needed to engage donor support and national commitments at multiple levels of criminal justice systems to ensure that education

designed to align policing with harm reduction is integrated into existing training schemes. Best practice guidelines are needed to formulate the international consensus on standards for police education regarding harm reduction policies and programmes, police-public health collaboration, and occupational safety. Efforts are also needed to improve professionalism and shift incentive structures for police to promote acceptance of harm reduction, especially in places where officers are subject to drug arrest quota systems or derive substantial income from extorting criminalized populations.

Reducing the risk of HIV and other blood-borne infections requires effective partnerships between law enforcement and program providers. Advocacy efforts are needed locally, nationally and internationally to promote network-building and support of internal champions. In the US city of Seattle, local police participation in the Law Enforcement Assisted Diversion program are helping drug users to identify treatment and other resources in lieu of arrest, with promising results for both health and safety (Banta-Green et al., 2013). In Vancouver, Canada, police cooperation with North America's first supervised injection facility helped reduce public injection and resulted in numerous public health benefits for PWID and the wider community (DeBeck et al., 2008). Nationally, in India, police education and sensitivity training involving sex worker organizations reportedly led to less confiscation of condoms and increased condom uptake. A toll-free hotline implemented by India's Central Reserve Police Force enables police across the country to obtain information on HIV, sexually transmitted infections, drug and substance abuse related issues. Other examples include efforts by the HIV/AIDS Asia Regional Program to support an enabling environment for effective harm reduction policies and build core capacity among national health and law enforcement agencies in Asia (Sharma & Chatterjee, 2012), and a Police Community Partnership Initiative in Cambodia (Thomson et al., 2012). Internationally, the Law Enforcement and HIV Network (LEAHN) promotes awareness and advocacy of harm reduction by fostering leaders within the law enforcement community, recognizing that harm reduction cannot and will not be effective without the active participation of police.

Police who violate human rights must also be held accountable for their actions. This can be facilitated by phone hotlines, or placing in-house lawyers at community venues where extra-legal police activity such as abuse, extortion, and harassment at NSPs and OST can be reported to facilitate effective responses. Re-aligning law enforcement with public health goals requires systematic documentation of both positive and negative police encounters. Such surveillance helps identify trends, inform program design, and track intervention impact over time. Documentation systems can be institutionalized at organizations serving PWID through the creation of standardized incident report forms and databases to store and collate complaints. Key police-related questions can also be added to periodic national behavioral surveillance surveys of PWID (Beletsky, Heller, et al., 2013).

It is critical to underscore that even in settings where human rights violations are pervasive, most drug users remain unwilling to report abuse. In one survey of Kyrgyz harm reduction programme clients, the vast majority of respondents (75%) reported that they did not come forward with information on recent police abuse. Reasons include fear of police retribution (73%), skepticism that anything positive could result from reporting (33%), and fear of community stigma (6%) (Beletsky et al., 2012). Given pervasive concerns about police retribution and privacy, any documentation systems to track human rights abuses must be designed to preserve confidentiality and security of those willing to share their experiences. Public health prevention efforts must partner with wider initiatives that seek to improve governance, police professionalism, and strengthen the rule of law.

Conclusion

A large and growing body of scientific evidence indicates that policies based solely on law enforcement without taking into account public health and human rights considerations increase the health risks of individuals and communities. Policy and legal reforms that promote public health over the criminalization of drug use and PWID are urgently needed. This should include alternative regulatory frameworks for illicit drug possession and use. Changing legal norms and improving law enforcement responses to drug-related harms requires partnerships that are broader than the necessary bridges between criminal justice and public health sectors. HIV prevention efforts must partner with wider initiatives that seek to improve police professionalism, accountability, and transparency and boost the rule of law. Public health and criminal justice professionals can work synergistically to shift the legal environment away from one that exacerbates HIV risks to one that promotes safe and healthy communities. The contents and conclusions of the paper reflect a broad consensus among social and clinical scientists participating in a UNODC Scientific Consultation on HIV/AIDS (UNODC, Scientific Statement, March 11, 2014).

Conclusion Statements:

- Laws and policies that criminalize drug use and possession undermine access to harm reduction, create stigma, and are key drivers of health risks among PWID. Alternative regulatory frameworks have resulted in reductions in drug-related harms and improved access to addiction treatment.
- Laws facilitating syringe access and opioid substitution treatment (OST) are widely considered as effective structural interventions to curb HIV spread among PWID.
- Policing practices are a pervasive barrier to the implementation and effectiveness of harm reduction policies and programmes that reduce transmission of HIV and viral hepatitis. Unauthorized policing practices (e.g., soliciting bribes, physical and sexual abuse) are especially detrimental to PWIDs' public health and undermine human rights.
- Conversely, police can facilitate harm reduction, including by referring drug users to evidence-based services (e.g., NSP, supervised injection sites, addiction treatment).
- Public health and criminal justice professionals can work synergistically to shift the legal environment away from one that exacerbates HIV risks to one that promotes safe and healthy communities.
- Policy and legal reforms that promote public health over the criminalization of drug use and PWID are urgently needed.
- There is an urgent need to re-align harm reduction and law enforcement approaches to support prevention and treatment of HIV and viral hepatitis among PWID. Promising interventions include police education programmes that 'bundle' HIV prevention messages with occupational safety, supporting internal champions of police-public health collaboration, and formulation of best practices of harm reduction-oriented policing.
- Treating human rights abuses as a public health issue, robust surveillance mechanisms are needed to document, address and prevent police activity that undermines harm reduction and the human rights of PWID.

Conflict of interest statement

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

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Commentary

Compulsory drug detention centers in East and Southeast Asia

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ABSTRACT

Over the last three decades in response to a rise in substance use in the region, many countries in East and Southeast Asia responded by establishing laws and policies that allowed for compulsory detention in the name of treatment for people who use drugs. These centers have recently come under international scrutiny with a call for their closure in a Joint Statement from United Nations entities in March 2012. The UN's response was a result of concern for human rights violations, including the lack of consent for treatment and due process protections for compulsory detention, the lack of general healthcare and evidence based drug dependency treatment and in some centers, of forced labor and physical and sexual abuse (United Nations, 2012). A few countries have responded to this call with evidence of an evolving response for community-based voluntary treatment; however progress is likely going to be hampered by existing laws and policies, the lack of skilled human resource and infrastructure to rapidly establish evidence based community treatment centers in place of these detention centers, pervasive stigmatization of people who use drugs and the ongoing tensions between the abstinence-based model of treatment as compared to harm reduction approaches in many of these affected countries.

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Introduction

In response to the growing epidemic of substance use, compulsory drug detention centers (CDDC) grew exponentially in the last decade throughout East and Southeast Asia (Thomson, 2010). In countries that include Burma, Cambodia, China, Laos, Malaysia, Thailand, and Vietnam, people who use drugs (PWUD) or are suspected of drug use can face compulsory detention ostensibly for the purpose of drug treatment and rehabilitation. These centers are administered through either the criminal or administrative laws and are operated by a variety of institutions depending upon country, including law enforcement authorities, the judiciary, local/municipal authorities, and the Ministry of Health and the Ministry of Social Affairs. PWUDs may be detained in police sweeps, or as a result of having a single positive urine test for drugs, and some turned over by family or community members (United Nations, Office of the High Commissioner, 2009). In most CDDCs in the countries mentioned, medical evaluation of drug dependency is not available upon entry into these centres and treatment of drug dependency and other related disorders are also often not available

(International Harm Reduction Association, 2010). This questions the fundamental legal legitimacy of their detention.

In Thailand, CDDCs were created in 2002 in response to a growing methamphetamine epidemic with the government introducing a law that reclassified PWUD as patients eligible for care, rather than criminals deserving of punishment (Pearshouse, 2009a). The number of these centers grew from six in 2000 to 84 in 2008, the majority of which were run by the Royal Thai Army, Air Force or Navy (Office of the Narcotics Control Board of Thailand, 2009). In China between 1995 and 2000, the government quadrupled its capacity to provide compulsory detoxification and by 2005 it launched a National People's War on Illicit Drugs with the goal of further increasing the number of people detained (Human Rights Watch, 2010). Resolution 06/CP in 1993 in Vietnam gave rise to the 06 centers where drug users were re-educated, punished, and rehabilitated, since they were viewed as a "social evil" (Giang, Ngoc, Hoang, Mulvey, & Rawson, 2013). By 1995, the Ordinance launched by the National Assembly drove a significant increase in the number of these CDDCs resulting in 129 centres across Vietnam by June 2010 (Giang et al., 2013). Similar centers were also created in Cambodia and Laos in response to the rising use of methamphetamines in these respective countries (Open Society Institute, 2010).

Although an accurate estimate of the total number of people detained in these centers is difficult to determine, it has been reported that more than 235,000 PWUD are detained in over 1000 centres in several of these Asian countries (Open Society Institute,

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2010). The estimated number of people detained in these centres range from 2000 in Lao PDR to more than 170,000 in China in 2011 (Human Rights Watch, 2010; Office of the Narcotics Control Board of Thailand, 2011; He & Swanstrom, 2006). In Thailand, there were an estimated 170,485 people enrolled in some form of drug treatment in 2011 of which approximately 60% were detained in CDDCs (Hayashi, Small, Csete, Hattirat, & Kerr, 2013).

The duration of incarceration in these centres vary from country to country. For example in China, the Anti-Drug Law of 2008 stipulates that first offenders are subject to community treatment for their substance use and the use of reeducation through labor has supposedly been abolished (Jingjing, 2012). Repeat offenders are subject to two (2) years of detention in a CDDC, regular assessments within CDDC are carried out allowing for the early release or prolongation of detention by one (1) additional year, and that upon release the PWUD are subject to continuous rehabilitation in their local communities for up to three (3) years with elapses and multiple convictions being common (Liu et al., 2013).

In Vietnam in the beginning, terms of detention are as long as five years: two of “treatment” and three of labor in facilities built near the detention centres. Vietnam has since moved to two years of detention followed by an evaluation for post rehabilitation which may include an additional two years in the CDDC (National Committee for AIDS, Drugs and Prostitution Prevention and Control of Vietnam, 2014). Under Malaysia’s drug control laws, any individual with a positive urine screen for substances classified as illicit by the Dangerous Drug Act (1952) and the Drug Dependence (Treatment and Rehabilitation) Act (1983) and deemed to be drug-dependent by a government medical officer can be mandated to two years of detention and two years of community supervision following release (Kamarulzaman, 2009).

Treatment of substance abuse

Although CDDCs have been established as drug treatment centres and detention is for the purposes of rehabilitation and treatment of substance use disorders rather than criminal punishment, entry and exit into these CDDCs are involuntary and frequently includes highly punitive measures in facilities operated by security officials and outside the medical system which rarely have medical personnel trained in drug dependence assessment or treatment (World Health Organization, 2009).

The two primary substances leading to detention in CDDC are opiates and amphetamine-type substances (World Health Organization, 2009). Opiate substitution therapy (OST) is not available in the CDDCs, instead “treatment” is primarily based upon forced abstinence (Amon, Pearhouse, Cohen, & Schleifer, 2013; Fu, Bazazi, Altice, Mohamed, & Kamarulzaman, 2012). In a cross-sectional study conducted in 2010 of two drug rehabilitation centers in Malaysia that house HIV positive detainees, substance use disorders were highly prevalent, with 95% meeting DSM-IV criteria for opioid dependence prior to detention and 93% reporting substantial or high addiction severity prior to detention. Current cravings for opioids and methamphetamines were reported among 86% and 58% of participants respectively despite a mean period of incarceration of 7.5 months. In these centers, treatment for substance withdrawal syndromes was not available. In the study described above, eighty-seven percent of participants reported anticipating relapsing to drug use after release (Fu et al., 2012).

High relapse rates following release from these centres have also been reported in China and Cambodia, with more than 90% of heroin users have been reported to relapse following release (United Nations Office of Drugs and Crime, 2010; Yan et al., 2013). While no formal evaluations on the effectiveness of CDDC in reducing return to drugs including methamphetamines have been conducted in

East and South-East Asia, interviews with officials in one country indicate that approximately 20% of those released from CDDCs test positive for methamphetamine within two months of release (Yan et al., 2013). In another country, centre staff indicated, “about 70 per cent of centre residents have been there before” (United Nations Office of Drugs and Crime, 2010).

CDDCs have been criticized for a variety of human rights abuses including involuntary and indefinite detention, physical abuse, torture of detainees, and the denial of or inadequate provision of medical care. Interviews with formerly detained individuals indicate that the common elements of treatment are forced work regimens set within an abusive environment, grueling physical exercises, and military style training within the detention environment (Human Rights Watch, 2010). Exercise has been reported frequently as accompanied by the mantra that, “when you exercise you sweat, and when you sweat the drug substance will be removed” (Amon et al., 2013). There are also widespread reports that detainees were tied up in the sun for hours without food or water, including punishment in isolation cells (Human Rights Watch, 2010). The foundation of this kind of treatment is based upon an ideology that drug use is pure exercise of free will, that an individual must be punished for their drug use, and that punishment will serve as a deterrent to a return to use upon release. In many countries, detainees are also forced to work often in factories or sweatshops that are on site without pay or at a rate far below the prevailing wage (World Health Organization, 2009). Evidence also demonstrates a high rate of drug overdose and crime recidivism among drug dependent individuals upon release from detention (Dolan et al., 2005; Ramsay, 2003).

Prevention and treatment of HIV in CDDC

Given the lack of effective HIV prevention programs for PWUDs until recently, many of the countries with CDDC face high rates of HIV and hepatitis C infections among PWUDs detained in these centres. In Malaysia, for example, HIV prevalence in CDDCs is estimated to be 10%, nearly two-fold higher than in prisons and more than 20-fold higher than in the community (Ministry of Health of Malaysia, 2008). In many instances, those living with HIV or AIDS and other related co-morbidities do not have access to treatment for any of the related infections (Gore et al., 1995; Jurgens & Betteridge, 2005). In addition there are reports of unsafe sex, unsafe drug use, and sex for drugs within CDDCs (Human Rights Watch, 2010; Open Society Institute, 2010; Jurgens, Nowak, & Day, 2011). Most CDDCs lack any form of HIV prevention programs including condoms and clean needles and syringes (Open Society Institute, 2009). In most centres, the only HIV prevention measures available are information, education, and communication (IEC) materials. The major barriers towards the provision of HIV prevention include the lack of financial resource and qualified staff and a general negative attitude towards those infected with HIV (Bezziccheri & Vumbaca, 2007).

Mandatory HIV testing is commonly carried out in many of these centres throughout the region with detainees rarely told of their results or linked to HIV care upon diagnosis (Cohen & Amon, 2008; Wolfe, 2010). In the study on the health status of 100 HIV positive detainees in Malaysia, only 9% were reported to have received antiretroviral therapy (ART) despite having been diagnosed with HIV for a median of 5.8 years (Fu et al., 2012).

The negative impact on health extends beyond the period of incarceration. In a cross-sectional study of 435 Thai drug users, it was reported that PWUD who had been exposed to CDDCs were more likely to report avoiding healthcare (Kerr et al., 2013). In Vietnam where there has been a recent rapid and massive scale up of ART, nearly half of all PLHIV across the nation continue to present late and initiate ART with CD4 counts less than 100 cells/mm³.

History of detention or incarceration and history of injecting drug use were significant risk factors associated with delayed entry into treatment and care (Rangarajan et al., 2014). Possible reasons for avoiding healthcare centres include the fear of loss of confidentiality in the clinic setting including the possibility of health records being shared between healthcare providers and police increasing the risk for an arrest and readmission to drug detention, and fear of stigma or discrimination in the community (Kerr et al., 2013).

Challenges faced by PWUD who have undergone detention upon re-entry into the community are exacerbated by deep drug-related and HIV-related stigma and discrimination in most of these countries. In a recent study in Vietnam of male PWUD released within the past two (2) years from “06 centers” in Hanoi, Vietnam, persistent stigma and discrimination hindered employment, increased participants’ social isolation and exacerbated their struggles with addiction (Tomori et al., 2014).

Evolving response and ongoing challenges

In Malaysia, PWUDs are sent to such detention facilities (locally known as PUSPEN) for a mandatory two-year sentence since its establishment in 1983 (Gill, 2010). These centers are operated by the Malaysian National Anti-Drug Agency under the Ministry of Home Affairs. Up until three years ago, the programs conducted in these centres mirrored those of other countries with an emphasis on forced work regimens, grueling physical exercises, and military style training (Pearshouse, 2009b; Human Rights Watch, 2010; Fu et al., 2012).

In 2005 in response to the increasing HIV epidemic driven by injecting drug use, the Malaysian government began implementing harm reduction programs that included needle syringe and methadone maintenance treatment (MMT) programs across the country and began reducing its reliance on detention and forced rehabilitation (Wan Mahmood, 2008). As of 2013, more than 65,000 PWUDs are receiving MMT provided through government hospitals and clinics, private healthcare practitioners and prisons throughout the country (Ministry of Health of Malaysia, 2014).

Beginning July 2011, in addition to the community-based (MMT) program provided by the Ministry of Health and private practitioners, the National Anti-Drugs Agency underwent a transformation that saw a shift away from compulsory detention by converting the CDDCs into Cure & Care Centres which provide voluntary comprehensive client centered treatment and support services including MMT (Degenhardt et al., 2014). The aim is to convert 18 of these 28 CDDCs into voluntary treatment centres by 2015 (Kaur, 2013). To date more than 36,000 PWUD have accessed these services; with a total of 6500 people currently receiving MMT (Kaur, 2013). In addition to the core clinical services, some centers include after-care housing assistance and vocational training, as well as religious or spiritual programs. A recent explorative qualitative study was undertaken to explore patient perspectives and satisfaction regarding treatment and services at the Cure and Care centre in Kota Bharu, Malaysia. In this semi-structured in depth interview with 20 participants methadone treatment, psychosocial programs, religious instruction, and recreational activities were identified as important factors contributing to treatment success for addressing both health and addiction needs. Though many had previously been in a CDDC, adherence to treatment in the C&C centre was perceived to be facilitated by the degree of social support and the voluntary nature of the programs (Ghani et al., 2014).

In a quantitative survey of ninety-six (96) participants from the same C&C centre in Kota Bharu where methamphetamine use is high, there was a significant decrease in the mean duration of days where participants were not using amphetamine or heroin upon enrolment at the C&C compared to prior experience. Among

the participants who reported using amphetamines (88.5%), there was a statistically significant decrease in the mean number of days over a 30 day time period in which amphetamines were used from 9.24 days in the 30 days before enrolling in treatment at the C&C to 0.84 days in the 30 days prior to study enrollment ($p < 0.001$). Similarly, among participants who reported using opioids, opioid use decreased significantly from 20.24 days in the 30 days before enrolling in treatment at the C&C to 0.84 days in the 30 days prior to study enrollment ($p < 0.001$).

Malaysia’s approach in response to the call for the closure of the CDDC is novel by utilizing elements of existing infrastructure and doing this within the existing legal framework. What has been accomplished is both important and demonstrative of how it is possible to utilize existing scarce resources and limited infrastructure in changing the entire foundation by implementing both evidence-based drug dependence treatment and harm reduction in voluntary setting.

Similar to Malaysia, in 2004 Vietnam implemented the National Strategy for Prevention and Control of HIV/AIDS that provided support for syringe exchange and condom distribution programs for high-risk groups, and in 2006, the Law on HIV/AIDS Prevention and Control (HIV law) officially approved harm reduction programs (Giang et al., 2013). In 2009, drug use behavior was removed from the Penal code under the influence of the international community and civil society (Giang et al., 2013). The continued policy shift in Vietnam as documented in the “Renovation Plan on Drug Treatment” aims to reduce the number of PWUD detained in CDDC from 63% in 2013 to 6% by 2020 (Oanh, 2014). Despite these marked changes that have taken place in Vietnam including amendments to decriminalize drug use under the Ordinance on Administrative Violations, drug use still remains an administrative violation, with users subject to administrative detention for up to two years. In addition, a number of new legal obstacles have surfaced which may affect the ability of HIV programmes to reach key populations at higher risk of HIV infection. Decree 94/2009/ND-CP, which guides the implementation of the Law on Drugs following the 2009/21 Directive, threatens to create a more punitive legal environment for PWUD (National Committee for AIDS, Drugs and Prostitution Prevention and Control of Vietnam, 2012). Under this new legislation, repeat drug offenders are subject to an additional period of ‘post-detoxification management’ for between one and two years (National Committee for AIDS, Drugs and Prostitution Prevention and Control of Vietnam, 2012). Nonetheless the progress on drug treatment reform on the basis of scaling up voluntary, community-based treatment and care was approved by the Vietnamese government in December 2013 (Decision 2596/QD-TTg), where 80 of the 107 centers will be reformed to provide voluntary and friendly detoxification with possible MMT service provision (National Committee for AIDS, Drugs and Prostitution Prevention and Control of Vietnam, 2014). With these changes, the harm reduction program in Vietnam continues to expand with MMT services being provided to 15,542 patients in a total of 30 provinces in 2013 (National Committee for AIDS, Drugs and Prostitution Prevention and Control of Vietnam, 2014).

In China, in an effort to address the HIV epidemic, China’s Ministry of Health launched a national MMT program to provide community methadone programs with the first eight MMT clinics in southwestern China in 2004 (Yan et al., 2013). The program has since expanded with more than 210,000 reported to be receiving methadone throughout the country in 2013 (Li & Li, 2013). However, detoxification in detention centers governed by the Ministry of Public Security continue in China with 227,000 drug users in compulsory detoxification and another 36,000 in mandatory treatment in the community reported in 2013 (Yan et al., 2013; Li & Li, 2013).

Three years after the call for closure of CDDCs many of these centres remain throughout the region. The transformation that has taken place in Malaysia and Vietnam are examples of changes that can be undertaken. However, following decades of reliance on enforcement and the criminal justice system, countries will face many challenges in transitioning to voluntary community-based drug dependence treatment services not least because of existing laws in several of these countries which provide for mandatory detention of people who use drugs in CDDCs. Along with a review of these laws and policies, greater financial investment in harm reduction compared to supply and demand reduction will need to take place. An additional challenge for most of the affected countries is the limited in-country technical capacity in substance use prevention, treatment, care and support for which capacity building in a broad range of areas will need to take place to transition treatment into voluntary community based settings (Nguyen, Nguyen, Pham, Vu, & Mulvey, 2012). A significant barrier to progress is the difficulty in convincing policy makers of the need for the immediate closure of the CDDCs in the absence of adequate resources and facilities providing evidence-based treatment in the community and the continued focus on abstinence-based model of treatment as compared to harm reduction approaches in many of these affected countries. Finally the ongoing tensions between the public health imperative and public security concerns result in ongoing detention of PWUDs even in countries which have adopted evidence-informed and rights-based health and social services in the community.

Conclusion

Despite the lack of evidence of its effectiveness and an international call for closure of the CDDCs, these centers continue to operate in many countries in East and Southeast Asian countries subjecting people who use drugs to continuous and ongoing human rights abuses, including lack of access to healthcare. Punitive drug laws and policies and an ongoing focus and reliance on abstinence-based model of drug dependence treatment remain potent barriers to access to prevention and treatment for HIV and related illnesses. Evidence-informed medical interventions are often absent in these centers despite a high proportion of the detainees being HIV positive or are at very high risk for infection. Models are emerging from several countries that have successfully transformed these centres into voluntary centres providing comprehensive evidence informed treatment and support services. We urge the international community in particular the United Nations entities to monitor the progress of the call for closure of the CDDCs made in 2012 and to ensure the immediate implementation of voluntary, evidence-informed and rights-based health and social services for people who use drugs in the community. The contents and conclusions of the paper reflect a broad consensus among social and clinical scientists participating in a UNODC Scientific Consultation on HIV/AIDS (UNODC, Scientific Statement, March 11, 2014).

Conclusion statements

- Despite a call for their closure, CDDCs continue to operate in many countries in the Asian region.
- Measures that are undertaken to treat people who use drugs within these centers run counter to accepted norms and evidence-based practices and often times violate human rights principles.
- Access to HIV prevention and treatment are often absent in these centers where a high proportion of the detainees are either HIV positive or are very high risk for infection.

- Models are emerging from several countries that have successfully transformed these centres into voluntary centres providing comprehensive evidence-informed and rights-based health and social services in the community for people who use drugs.
- There is an urgent need to review existing laws and policies and to reallocate resources to ensure that the CDDCs in its current form no longer operate in countries in the East and SouthEast Asian regions.

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