Drug users are vastly overrepresented in prison populations. Once inside they face increased risks of acquiring infections such as HIV, hepatitis and TB, and on release they face an elevated risk of fatal overdose. Relapse and recidivism are the norm following release from prison. The implementation of evidence-based drug treatment programmes in prison is rare, yet drug treatment in prison reduces the transmission of infections, recidivism and fatal overdose on release. Recognising the negative returns associated with incarceration, many jurisdictions have begun to consider alternatives such as depenalisation of the personal use of illicit drugs, provision of treatment and social reintegration of drug offenders, and a shift in focus from supply reduction to demand and harm reduction measures in the community and in prison. Women
with drug problems are twice as likely to have been imprisoned for a drug offence as incarcerated men. Similarly, HIV prevalence is higher among female inmates. Serious attention should be paid to implementation of non-custodial sentences for women, particularly during pregnancy and those with young children.

Alternatives de santé publique à l’incarcération pour les auteurs d’infractions liées à la drogue

RÉSUMÉ Les toxicomanes sont largement surreprésentés parmi les détenus des prisons. Une fois incarcérés, ils sont d’autant plus exposés au risque de contracter des infections telles que le VIH, l’hépatite et la tuberculose, et à leur libération, ils font face à un risque élevé d’overdose fatale. Les rechutes et la récidive sont la norme après une remise en liberté. La mise en œuvre de programmes de traitement de la toxicomanie reposant sur des données factuelles est rare en milieu carcéral, alors que traiter la toxicomanie en prison permet de réduire la transmission d’infections, la récidive et l’overdose fatale à la sortie. Prenant note des conséquences négatives associées à l’incarcération, de nombreuses juridictions ont commencé à envisager des alternatives telles que la dépénalisation de l’usage personnel de substances illicites, la fourniture d’un traitement et la réinsertion sociale des auteurs d’infractions liées à la drogue, ainsi qu’un changement de priorité, passant de mesures de réduction de l’offre à des mesures de réduction de la demande et d’atténuation des effets nocifs dans la communauté et en prison. Les femmes toxicomanes sont deux fois plus susceptibles d’être emprisonnées pour des infractions liées aux drogues que les hommes. De même, la prévalence du VIH est plus élevée chez les femmes détenues. Une sérieuse attention doit être portée à l’application de peines non privatives de liberté pour les femmes, notamment lorsqu’elles sont enceintes ou en charge de jeunes enfants.

1Department of Mental Health and Substance Abuse, World Health Organization, Geneva, Switzerland. 2Programme of International Research and Training, National Drug and Alcohol Research Centre, University of New South Wales, Sydney, Australia (Correspondence to Kate Dolan: k.dolan@unsw.edu.au). 3Semel Institute for Neuroscience and Human Behavior, Geffen School of Medicine, University of California at Los Angeles, Los Angeles, United States of America.

Received: 19/05/16; accepted: 02/04/17

Introduction
Globally, at any given time, there are over 10 million people held in prisons and between 2.5 and 3 million of these are held in pre-trial detention. However, turnover in the prison populations is thought to be at least 3 times that with some 30 million individuals being detained and released into the community each year. The vast majority of prisoners are male, with females accounting for less than 10% of this population (1). Drug offenders account for 3–29% of prison inmates in the European Union (EU), 4–29% of inmates in non-EU European countries, 5–53% of inmates in the Americas and 10–58% of inmates in Asia/Oceana (2). In the United States of America (USA), between 24% and 36% of all heroin addicts pass through the corrections system each year, representing more than 200 000 individuals (3).

Incarceration has traditionally been justified on the basis of its assumed effect on deterrence, crime reduction, rehabilitation and retribution. However, there is now a considerable body of evidence indicating that punishment (including imprisonment) provides neither deterrence (4) nor rehabilitation (5), and that the effects on crime reduction are minimal, even in countries with high rates of incarceration (6).

Relapse and re-offence are usual after release from prison. In the USA, for example, drug-use relapse rates (even among those who participate in prison-based programmes) are more than 80%, and 3-year re-arrest rates are consistently around 70%. From 1996 to 2006, the population of the USA increased by 13% and the imprisoned population increased by 33%, yet the proportion of prisoners with a drug problem increased by 43% (7). Drug-dependent offenders are more likely to return to prison than other offenders. In the USA, over 50% of drug-dependent inmates have a previous imprisonment compared with 31% of other inmates. In New South Wales, 84% of heroin-dependent inmates were re-imprisoned within 2 years of release, compared to 44% of all prisoners (8). Australian drug injectors reported an average of 5 imprisonments (9). These high rates confirm that most drug offenders do not receive treatment while in prison nor are they being referred to treatment on release.

Although drug use tends to occur at a lower level in prison than in the community, the infectious disease risks are often higher, as inmates share syringes when they cannot access sterile ones (nor can they access products to sterilize them). As a result, having one or more prior incarceration is a major risk factor for having HIV and hepatitis C. In fact, among injection drug users in Tehran, Islamic Republic of Iran, a history of shared needles in prison was found to be the strongest predictor of being HIV-positive (10). In two Scottish prisons, 6% and 25% of injection drug users reported that they started injecting while in prison (11). The risk of death among people on parole during the first 2 weeks after release from prison is nearly 13 times greater than among individuals of similar demographic background, with drug overdose being the leading cause of death (12).
Recognizing the high cost and negative returns associated with imprisonment, many authorities have begun to consider alternatives. From a public health perspective, such alternatives include:

Decriminalize personal use of illicit drugs,

Provide treatment and social reintegration of people with drug use disorders who come into contact with the criminal justice system,

Move the focus of funding away from supply-reduction measures towards demand- and harm-reduction measures.

**Rationale for alternatives to incarceration for drug offenders**

Alternative approaches to imprisonment are consistent with the obligations UN Member States have under the international drug control conventions, as the following details:

*Alternatives to conviction and punishment are permitted in the international drug control conventions and treatment is encouraged.* The 3 international drug control conventions each contain a clause that allows for treatment and social reintegration as an alternative to conviction and punishment. The conventions also explicitly mention the need to make treatment available.

*Conviction of minor drug offences does not prevent drug use.* Conviction and punishment of minor drug offences does not deter drug use and does not lead to rehabilitation.

*Conviction and punishment of minor drug offences is often disproportionate.* The International Narcotics Control Board (INCB) has also reminded Member States of this principle of proportionality in criminal justice and to take the Tokyo rules into consideration (13).

*Conviction and punishment is expensive and causes harm.* Imprisonment is more expensive than treatment and uses valuable resources that could be used more effectively for the
prevention and treatment of drug use disorders. Increased spending on prisons in the USA, for example, has been shown to correlate with a reduction in spending on education, education being one of the most effective investments a country can make in preventing drug use (14).

Treatment and social reintegration reduce both drug use and drug-related crime. Treatment of substance use disorders has been consistently shown to reduce drug-related crime. The extent of the reduction varies depending on the type of substance use disorder and the type of treatment. In the treatment of opioid dependence, drug use and drug-related crime can be reduced by more than 50% with the use of opioid maintenance treatment such as methadone (15). Non-dependent drug use can be reduced by brief interventions, while dependent use of cannabis and stimulants can be reduced by more structured psychosocial interventions (16). Overall, most experts agree that treatment of substance use disorders leads to a significant reduction in offending (17,18).

Treatment for drug use disorders is a cost-effective way to reduce drug use and crime in addition to other benefits. In addition to reducing drug use, treatment of substance use disorders reduces health care problems such as HIV and facilitates employment. Cost-benefit analyses of drug treatment, looking at the effect on health care costs, employment, and government expenditure on social services and crime, have estimated the returns on investment range from 7:1 to 18:1, meaning that for every dollar spent on drug treatment, savings of between 7 and 18 dollars are returned (18,19).

Public health alternatives

Decriminalization

Countries can decriminalize the personal use of illicit drugs. The international drug control conventions distinguish between “minor” and “serious” drug offences. The accepted interpretation of this phrasing is that minor crimes may be managed entirely by referral to treatment, by education or even simply by admonishment as an alternative to conviction or punishment, whereas serious crimes should result in conviction and punishment, in proportion to other offences in the country.

Thirty countries have reformed their drug policies to permit some form of decriminalization (20). Decriminalizing drug possession and investing in demand and harm reduction services can provide major benefits for public safety and health, including:

- reducing the number of people in prison,
reducing criminal justice costs and redirecting resources from criminal justice to health systems,

redirecting law enforcement resources to prevent serious and violent crime,

reducing unjust racial disparities in drug law enforcement and sentencing, imprisonment and related health characteristics and outcomes,

minimizing the social exclusion of people who use drugs, and creating a climate in which they are less fearful of seeking and accessing treatment, using harm reduction services and receiving HIV/AIDS services.

Other benefits are: increasing uptake into drug treatment, improving relations between law enforcement and the community, and protecting people from the wide-ranging and debilitating consequences of a criminal conviction and period of imprisonment.

Although countries are free to enforce higher penalties, a public health approach that is consistent with the drug control conventions is to use the flexibility within the conventions to avoid conviction and punishment of people who commit drug offences related to the personal use of illicit drugs. Also, consistent with this approach is the encouragement of all people with substance use disorders who come into contact with the criminal justice system to receive the treatment they need, regardless of the severity of the crime.

Box 1

Encouraging treatment

Opportunities for treatment as an alternative to conviction and punishment can occur at many stages in the criminal justice process, starting from initial police contact through to community reintegration after prison. In the same way that treatment and care provided to people with drug use disorders outside the criminal justice sector, treatment is usually as an outpatient, but may include residential therapeutic care for those in need of such services.
Schemes within the criminal justice system that facilitate treatment and care as an alternative to conviction or punishment fall into 4 broad areas depending on their location in the criminal justice process: 1) police diversion schemes, cannabis caution schemes; 2) regular court and probation service based schemes; 3) specialist problem-solving courts, including drug courts; and 4) early release/aftercare of sentenced prisoners.

In combination with these schemes, interaction with the health care system and diversion away from the criminal justice system can occur at numerous points: 1) pre-arrest (i.e. as an alternative to arrest); 2) police arrest; 3) in police custody and police custody on suspicion of a criminal offence; 4) in the pre-trial process; 5) during the trial process; 6) on sentencing; 7) on entry to prison; 8) in prison; 9) on preparation for release from prison; 10) on release into the community, including while on parole; and 11) on leaving the criminal justice system (either on release from prison, or when the parole period ends).

**Drug courts**

A systematic review of the effectiveness of drug courts found that participants have lower re-offence than non-participants; on average re-offence decreased from 50% to 38%, and can last for up to 3 years. Larger reductions in re-offence were found in adult drug courts that had high graduation rates and those that accepted only non-violent offenders. Juvenile drug courts have substantially smaller effects on re-offence (21).

There are currently more than 2 000 drug courts operating in the USA. Programmes also operate in Australia, Canada, United Kingdom and New Zealand. Drug courts vary in how they manage their caseloads, in the ancillary services they offer and in the testing and sanction schedules they apply. What they all have in common is the provision of ongoing supervision from a judge, with offenders appearing before the judge for regularly scheduled updates. The drug court movement has been very successful. Many evaluations suggest that this is an effective approach to managing offenders in the community (22), although most of the support comes from non-randomized evaluations. The most rigorous evaluation, using a randomized, intent-to-treat design was conducted on the Baltimore City Drug Court in Maryland, USA. A 1-year follow-up showed significantly lower levels of drug use and fewer arrests among those assigned to the drug court versus those in the control situation. By the time of the 3-year follow-up, these differences were no longer significant, although trends still favoured the drug court participants (23,24).
Community supervision and treatment

Awareness of the high prevalence of drug use among criminal offenders prompted a number of large-scale efforts in the USA to use the power of legal pressure to encourage substance-abusing offenders to enter treatment. The most common form was “diversion,” in which adults convicted of nonviolent drug possession offences have the option of participating in drug treatment in the community instead of imprisonment or probation without treatment. Unfortunately, evaluations of these efforts showed that these diverted offenders were more likely to be rearrested for a drug crime than other participants referred to treatment by the criminal justice system (25) or similar offenders charged prior to this initiative (26). One of the most important findings to emerge from these evaluations was that requiring the existing treatment system to provide services for drug users of all severity levels resulted in a misallocation of resources. Most importantly, attempting to treat everyone with a drug use history meant many offenders with serious drug use disorders received inadequate care. Moreover, lax and inconsistent enforcement of these referrals allowed offenders to ignore treatment referrals—and even scheduled probation appointments and drug testing—with no penalties. These experiences made it clear that effective management of drug offenders requires close monitoring and consequences for non-compliance. It also became clear that targeting treatment resources on those with the highest need is more effective than offering low levels of treatment for everyone. This can be construed as a continuum of services ranging from random drug testing coupled with gradually increasing sanctions to residential care with the full complement of ancillary medical and social services.

Drug treatment for prisoners

Given the large number of injection drug users and the fact many inmates start injecting in prison and are at risk of injecting-related harm, the prison setting would seem the logical place to provide drug treatment. With heroin often the main drug injected in prison, it follows that medication assisted treatment of opioid dependence (MATOD) would be the ideal treatment. MATOD uses medicines such as methadone or buprenorphine and psychosocial support. MATOD has been shown to reduce injecting and syringe sharing (27) and hepatitis C transmission (28,29) in prison and mortality after release from prison (29). MATOD reduced post-release criminal activity (30) and re-imprisonment by up to 20% among a group with a high rate of re-imprisonment (31).

Cognitive behavioural therapy (CBT) has been shown to reduce re-arrest (32,33) and re-imprisonment (34). It has also been identified as an effective treatment for criminal behaviour and alcohol and drug use problems in offenders (35,36). Prison-based cognitive behavioural therapy (interventions were cost-effective in terms of re-offence (37).
Box 3

Women in prison

The number of imprisoned women is increasing in all 5 continents; it increasing by an average of 16% in the past 6 years (1). In 2012, more than 600 000 women and girls were held in prisons worldwide (38). Imprisoned women are twice as likely to have a drug problem as male prisoners and are more likely to have been imprisoned for a drug offence than imprisoned men (39). A global review found HIV prevalence was higher in female than in male inmates in 15 countries, including Afghanistan (4% versus 1%) and was lower than male inmates in only 7 countries (40).

Women who are poor and uneducated are more likely to be arrested and less likely to afford legal counsel than men. Alternatives to incarceration for drug-involved women are needed, especially for those in prison for non-violent offences who pose no risk to public safety. Serious attention should be paid to the development and implementation of non-custodial sentences for women, particularly during pregnancy and when they have young children. A study of women seeking treatment in the Islamic Republic of Iran found that they were more likely to have been in prison (48%) than in drug treatment (20%) (41).

Treatment coverage for prisoners

Although a country may provide drug treatment for inmates, the coverage is often very poor. In 1996, 5 countries provided methadone for prisoners; this increased to 29 countries in 2009 (42), to 41 countries in 2012 (43) and to 43 countries in 2013 (44). Even when a country provides MATOD to inmates, few receive it. A review of 20 countries with prison-based MATOD found less than 10% of inmates in 17 countries were in treatment (42). An assessment revealed that injecting drug use is known to occur in 148 countries (45).

Of the 2.3 million prison inmates in the USA, 65% meet the DSM-IV medical criteria for alcohol or other drug abuse and addiction, but only 11% received treatment for their addictions with less than 1% of prison budgets spent on treatment (7).

Demand and harm reduction measures

There needs to be a shift in the focus of funding from supply reduction measures to demand and harm reduction measures. In addition to reducing drug use, treatment of drug use disorders reduces health care problems such as HIV and assists with a return to work. Even within many prison systems, there is a focus on supply-reduction measures at the expense of demand- and
harm-reduction measures. An Australian study found that despite an extensive use of drug searches and urinalysis, the detection of drugs was modest for both strategies. The most commonly used drug was cannabis with the detection of drugs such as amphetamines and heroin being very low. Several millions of dollars are spent on these supply-reduction measures, while many inmates go untreated for drug dependency (46).

**Conclusion**

An imprisonment-based response to drug use in society is costly, is associated with significant public health risks, particularly for women who use drugs, and is of questionable benefit to public safety. Opportunities for alternatives to imprisonment exist at every step in the criminal justice process, and examples can be found from different authorities around the world for each of these. Such examples demonstrate the feasibility of such approaches, but also the challenges in setting up effective programmes. Further work is needed to clearly evaluate the relative effect on public health and public safety of the different approaches.

**Funding:** None.

**Competing interests:** None declared.

**Box 4**

**Table 1**

**References**

23. Gottfredson D, Exum L. The Baltimore City Drug Court: one-year results from a


