

# Syringe Exchange Programmes in the Context of Harm Reduction

Carla Torre

*Coordenação Nacional para a Infecção VIH/sida*

Injecting drug users (IDU) are particularly vulnerable to hepatitis C virus (HCV), human immunodeficiency virus (HIV) and other bloodborne infections as result of sharing contaminated injecting equipment. Providing access and encouraging utilization of all sterile injection paraphernalia for IDU is considered a fundamental component of an effective harm reduction programme.

Twenty-five years after the implementation of the first official syringe exchange programme (SEP) in the world, providing IDU with access to sterile injection equipment remains a serious challenge in both developed and developing countries.

The capacity of any given SEP to reach IDU is dependent on its particular characteristics. SEP are extremely diverse in their modes of operation, injecting equipment dispensation policies and availability of other services provided. Different modalities for improving injecting equipment delivery, such as conventional SEP in fixed-sites, community pharmacy-based distribution, dispensing machines and outreach programmes, have been developed to improve access to and utilization of sterile injecting equipment and to increase IDU choice.

Understanding barriers and preferences to SEP access of IDU is essential to providing services which meet their needs.

**Key-words:** syringe exchange programme; injecting drug users; harm reduction.

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## THE RATIONALE OF SYRINGE EXCHANGE PROGRAMMES

Injecting drug users (IDU) are particularly vulnerable to hepatitis C virus (HCV), human immunodeficiency virus (HIV), and other bloodborne infections as result of sharing (multi-person use) contaminated injecting equipment (1,2).

There are an estimated 16 millions [11 to 21] injecting drug users worldwide (3) - 78 percent of whom live in developing or transitional countries (4).

Hepatitis C virus is a serious public health issue. Globally, HCV has one of the highest prevalence rates among all infectious diseases. The World Health Organization (WHO) estimates that about 180 million people are infected with HCV, 130 million of whom are chronic HCV carriers (5,6). By contrast, estimates show that 33 million [30 to 36 million] people are living with HIV/AIDS (PLWHA) worldwide (7).

Fewer sharing partners are necessary to sustain HCV transmission than are necessary for other bloodborne viruses (8). Indirect drug sharing and preparation practices, such as backloading or frontloading (front and/or backloading are defined as splitting drugs prepared in one recipient with subsequent transfer of prepared drug from one syringe to a second syringe, via the front of the recipient syringe – frontloading - or the back of the recipient syringe, after removing the plunger – backloading), sharing cotton, cooker, and water, have been associated

with HCV transmission (9-14).

Injecting drugs has been the predominant mode of transmission of HCV during the past 40 years in countries such as the United States and Australia, and accounts for most newly acquired infections in many other countries, including those in Western, Northern, and Southern Europe (15). Antibody levels of over 60% among IDU samples tested in 2003–2004 were reported from Belgium, Denmark, Germany, Greece, Spain, Ireland, Italy, Poland, Portugal, United Kingdom, Romania and Norway. The highest prevalence (over 40%) among IDU under age 25 was found during 2003–2004 in samples from Belgium, Greece, Austria, Poland, Portugal, Slovakia and the United Kingdom (16).

More than 120 countries reported HIV transmission associated with sharing of contaminated injecting equipment and about 3 million [0.8 to 6.6 million] people who inject drugs worldwide are living with HIV/AIDS (3).

Injecting drug users have been initially driving the HIV epidemics in western Europe and North America (17). In 2008, the Joint United Nations Programme on HIV/AIDS (UNAIDS) reports HIV transmission due to injection drug use is advancing rapidly in many countries, mostly in Eastern Europe and Central (18), south and southeast Asia (3,7).

According UNAIDS, by 2010, the global epicentre of HIV epidemic is expected to shift from sub-Saharan Africa, where injection drug use has made a negligible contribution, to Asia and Central and Eastern Europe. This

region is the one of the fastest growing HIV epidemics in the world and has had a 20-fold increase of PLWHA in less than a decade (19,20).

The sexual behaviour of IDU should not be neglected (21). Cross-sectional studies from the nineties found a potential role for sexual risk behaviour in HIV transmission among drug users (22) as did recent prospective studies (23-25). Catharina Lindenburg *et al* investigated trends in HIV incidence and both injecting and sexual behaviours among HIV-negative drug users of the Amsterdam Cohort study since 1985 up to 2004. A declining trend in HIV incidence accompanied a steep declining in injecting was observed despite continued risky sexual behaviour. In the later years of the study period, new HIV seroconversions were related mainly with unprotected heterosexual contacts (24).

In 2007 a total of 48 892 HIV cases were reported from 49 of the 53 countries in the WHO European Region (missing data for Austria, Italy, Monaco and Russia Federation). Of these, 13 538 cases were reported among IDU (26).

According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), the number of newly diagnosed cases of HIV among IDU is estimated to be currently around 3500 *per annum* in the EU (27).

The response to HIV favoured the need for scaling up of prevention, treatment and care. In particular the world made an unprecedented commitment during the United Nations General assembly Special Session on HIV/AIDS in 2001 to halting and reversing the epidemic by 2015 (28). Countries face the challenge of translating these commitments into practical programmes, including a range of comprehensive interventions to address HIV transmission related to injection drug use (29). Later, Europe reaffirmed this commitment and set its own targets and goals in the Dublin Declaration (30).

Regardless of the effort to treat drug dependence effective HIV prevention for injecting drug users involves ready access to opiate substitution treatment (OST) and to syringe exchange programmes (SEP)<sup>1</sup>. In addition, prevention programmes should help injecting drug users to reduce the risks of sexual HIV transmission and link them to other health and social services, including confidential HIV testing, counselling, and antiretroviral therapy. Together, these programme components are commonly known as "harm reduction" (1,4,29,31).

Studies have consistently demonstrated that harm reduction prevents HIV infections and risk behaviours without contributing to increased drug use or increasing other harms in the communities in which such programmes operate (1,20,32-34).

A wide variety of measures have been developed to improve access to and utilization of sterile injecting equipment, including SEP at different settings, pharmacy-based distribution, sale or exchange-schemes, strategies for disinfecting needles and syringes where they are reused or shared, vending or distribution machines and other distribution programmes, policies and programmes for safe disposal of used syringes and needles and injecting paraphernalia legislation (29).

The WHO reported that in 2004, SEP operated officially in forty countries (29) and has increased to 60 in 2007 (35). In 2007, substitution therapy with methadone was available in only 52 countries, and with buprenorphine in only 32 countries (7).

To control an epidemic of the magnitude of HIV among IDU would require public health measures on a scale proportional to the expected harm. These programmes need to be implemented on a sufficiently large scale to ideally reach every IDU (36,37). Nevertheless, there are still considerable differences between countries in the nature and scale of their national drug problems and also in the range and configuration of response. Some measures – especially SEP and OST remain controversial in many parts of Eastern Europe and Asia, whilst the availability of sterile injecting equipment in most of these countries is clearly insufficient to slow the spread of HIV and other bloodborne infections among drug users (38,39).

WHO strongly recommends that prison and public health care be closely linked (40). Despite that, prisons and prison health in particular are not always high on the agenda of politicians, but the dynamic of transmission of infectious diseases in prisons and ultimately from prisons to the rest of the society makes obvious the importance of ensuring better access to health care and health promotion in prisons.

About 8 to 10 million people are imprisoned globally. In many countries, drug users are at high risk of being imprisoned, due to crimes related to drug production, possession, trafficking or use, or crimes committed to guarantee the resources to purchase drugs (7).

Obviously, injecting drug behaviour also occurs in prisons. Since it is illegal, it is more likely to occur with unsafe shared equipment. A large number of studies from countries in many regions of the world reported HIV and/or HCV and/or hepatitis B virus (HBV) seroconversion within prisons or, more often, showed that a history of imprisonment was associated with a higher prevalence or incidence of HIV and/or HCV and/or HBV infection among IDU. In Lithuania the use of non-sterile injecting equipment resulted in one of the largest documented HIV outbreaks in the Alytus prison (41).

Given the prevalence of injecting drug use among inmates in many countries and the resulting risk of HIV and HCV transmission, providing sterile needles and

<sup>1</sup> In this document the term SEP is used to refer to programs that provide IDU with access to sterile injection equipment, health education, referrals, counselling and other services. However, in other parts of the world, the term needle exchange program (NEP) is used as the label for these types of programs. The term needle and syringe programs (NSP) is growing in popularity and in response to the move of many programs away from 'exchange' of equipment to 'distribution' of equipment with or without a return of used equipment. Nevertheless, in Portugal, these programs have been known as SEP since their inception. Consequently, the term SEP is used throughout the document. The term 'Exchange' refers to needle/syringe exchange, distribution and disposal.

syringes to prisoners has been widely recommended (40,42). As of 2006 SEP were introduced in over 50 prisons in 12 countries in Western Europe, Eastern Europe and in Central Asia. In some countries, only a few prisons have a SEP, but in Kyrgyzstan and Spain SEP have been rapidly scaled up and operate in a large number of prisons (41,42).

## HISTORICAL CONTEXT OF SYRINGE EXCHANGE PROGRAMMES

Acquired immunodeficiency syndrome (AIDS) was identified among IDU in 1981. The first cases of AIDS among IDU were highly concentrated in the New York City, leading to a false impression that the problem clustered geographically in this area (43-45). The development of the HIV antibody tests in 1985 showed HIV infection among drug injectors in many other U.S. and European cities, although at widely varying prevalence levels. By the mid-80s, HIV infection among IDU was seen as an important problem in many parts of North America and Western Europe (44).

The Edinburgh epidemic of injection drug use started around 1980 and peaked in 1983-84, though there were few medical provisions for dealing with this problem since, unlike many other UK cities, in the early 1980s Edinburgh had little in the way of specialist services for drug users (46). In the mid-80s UK drug treatment service had become largely focused on the achievement of abstinence.

The idea of distributing injecting equipment to drug users was first advanced by a pharmacist in Edinburgh, following an epidemic of hepatitis B and C related with injecting drug use. This decision was soon overruled by authorities. In 1982, in an attempt to restrict the IDU epidemic, the Royal Pharmaceutical Society of Great Britain advised its members to restrict needle and syringes sales to only those individuals requiring them for therapeutic reasons (29,46). Nonetheless, trading of limited numbers of syringes and needles remained in some areas of the UK. Drug users in Edinburgh reported that their equipment was commonly confiscated by the police, during searches, as a means of gathering evidence against the suppliers. This resulted in suppliers' enforcing the use of drugs on site – similar to shooting galleries. By late 1984, intense police activity had almost eliminated this "market-place", considered at the time as illegal services (46).

In 1983, after an outbreak of hepatitis B among IDU, an Amsterdam drug users group (*Junkiebond*) required municipal health authorities to provide sterile injection equipment, but the request was initially rejected (29). Nevertheless, in 1984, after a large pharmacy in central Amsterdam stopped selling injection equipment to IDU, the decision was soon reversed, allowing for the establishment of the first official SEP in the world (47-49). The SEP-mobile van was also first introduced in Amsterdam, in 1986. It was, in fact, a methadone dispensing but also offered injecting equipment (50).

The Amsterdam SEP was originally developed to pre-

vent the spread of hepatitis B, but its goal soon became to prevent HIV infection and it was expanded to other Dutch cities (47,48) and also to other countries.

In April 1987, the government of the United Kingdom launched a pilot intervention involving fifteen schemes, which included one pharmacy-based scheme, influenced by the Scottish evidence of increased transmission of HIV among IDU following shortage of syringes (the highest rates known of HIV were in Edinburgh, where between 1983 and 1985 half of 164 heroin users were infected). There was a fear that this could replicate elsewhere in Britain (51). After a one-year evaluation a national system of SEP was implemented and different models were developed; schemes based within hospitals, drug agencies and pharmacies (52). In 1987 the Royal Pharmaceutical Society revised its restrictive policy on sales of needles and syringes and issued guidelines for pharmacists taking part in SEP (53).

Therefore, when evidence on the effectiveness of SEP began to accumulate, most industrialised countries, in Western Europe, Australia, New Zealand, and Canada, openly supported SEP and governments rapidly decided to provide sterile syringes to IDU through a combination of different programmes and increased availability of sterile injection equipment through pharmacies (54).

In the European Union context, Portugal was the sixteenth country to implement an SEP (1993) and the twelfth country that financed those programmes with public resources (1994) (55).

Syringes dispensing machines were first introduced in Denmark, in June 1987, and followed a few months later by Norway (50).

Nevertheless SEP remains controversial in many parts of the world. Since 1988, US law banned the use of federal funds for SEP. Federal funding of SEP has been prohibited until "*the Surgeon General determines that such programmes are effective in preventing the spread of HIV and do not encourage the use of illegal drugs*" (56). Despite the results of many USA government-sponsored reviews of SEP, which concluded that such programmes reduced the incidence of HIV infection among IDU and do not lead to an increase in rates of drug use – the ban on federal funding for SEP was not lifted. In maintaining a ban on national funding for these programmes, the USA is unique in the world (54,57,58). Opposition to SEP arose from some drug-treatment providers, ethnic minority communities, law enforcement officials, politicians, local business people and residents (56,59,60).

Some of the initial SEP in USA were the initiative of activists and some later gained legitimacy and funding from local city governments and public health programmes (58).

In 1986, Jon Parker, a recovering IDU and student at Yale University School of Public Health, formed a group called the National AIDS Brigade and started the first "underground" SEP in USA. Parker started to distribute and exchange syringes on the streets of New Haven, Connecticut; actions that would lead him to be repeatedly arrested (45,58).



The first formal programme in USA was established in Tacoma, Washington, in 1988, and later in New York City, Portland, Oregon, and San Francisco, California, in 1989 (61). The New York City programme was started with severe restrictions – a single location near a police station with participant identification required and only one syringe per visit. The Tacoma program operated from a tray table from the trunk of an automobile (45).

Since then the number of SEP in USA has increased from 55 in 1994 (62) to 184 in 2007 (63).

Barbara Tempalski *et al* examined the effects of political, socioeconomic, and organizational characteristics, including need (measured by the prevalence of AIDS cases among IDU or the proportion of IDU in each US metropolitan area), resources and local opposition in 96 USA metropolitan areas on the presence of SEP. SEP were more likely to be located in areas with high proportion of men who have sex with men, with high proportion of college-educated individuals and with presence of grassroots activists and organizations (e.g. AIDS Coalition to Unleash Power). Surprisingly, need was not a predictor (59).

It may be close to reality to say that sometimes politics is the basic science of public health (64), as shown by this statement made in the first presidential campaign of George W. Bush: *“(...) I do not favor needle exchange programs and other so-called ‘harm reduction’ strategies to combat drug use. I support a comprehensive mix of prevention, education, treatment, law enforcement, and supply interdiction to curb drug use and promote a healthy, drug-free America, not misguided efforts to weaken drug laws. (...) America needs a President who will aim not just for risk reduction, but for risk elimination that offers people hope and recovery, not a dead-end approach that offers despair and addiction”* (65).

Another paradigmatic example is the implementation of SEP in prison settings; it is paradoxical from legal, public health and human rights perspectives that IDU inmates may be placed at higher risk of bloodborne infection compared to IDU within society at large.

Despite the existence of WHO Guidelines on HIV/AIDS Infection in Prisons, published in 1993, which recommends that *“in countries where clean syringes and needles are made available to injecting drug users in the community, consideration should be given to providing clean injection equipment during detention and on release”*, few countries implemented programmes (41).

The first SEP within a prison system was established in Switzerland in 1992. The initial program was started on an informal basis by a physician who, ignoring prison regulations, began distributing sterile syringes to patients who were known to inject drugs (42).

Despite the effectiveness of SEP within prison settings being well documented some interventions remain unpopular among some politicians. The decision on the part of several state governments in Germany to end prison SEP clearly illustrates the continuing controversial nature of such programmes, even within jurisdictions

where they have a history of successful implementation. Since 2001 political decisions have forced the closure of six SEP (42,66).

In other countries, including Portugal, there has been a lack of political leadership and political will to implement these programmes. Only in 2007 the Portuguese Government launched a pilot experiment SEP in two prisons.

Consumption rooms were developed in cities where – despite the availability of a variety of harm reduction services such as SEP, as well as a range of treatment options, including OST – public drug use persisted and there remained serious concern about infectious diseases, drug-related deaths and/or public nuisance. Although evidence suggests that consumption rooms reduce overdose deaths, sharing and other risk behaviours, this intervention remains controversial largely because of concerns that provision of a legal place to inject drugs may encourage initiation into injection drug use (67).

The first consumption room was opened in Bern, Switzerland in 1986. In the early nineties, the Netherlands and Germany opened their first consumption rooms, and in 2000 Spain followed (68). As of 2006, there were consumption rooms operating in Switzerland, the Netherlands, Germany, Spain, Luxembourg, Norway, Australia and Canada (68, 69).

In Portugal the implementation of consumption rooms, is allowed by law, since 2001 (Decree-law no. 183/2001, of 21st June) (70). However, despite the existence of this law, its implementation remains to be accomplished.

## MODES OF SERVICE DELIVERY AND SPECTRUM OF SERVICES

A variety of measures have been developed to improve access to and utilization of sterile injecting equipment and to increase users choice. These include several methods for distribution or sale of injecting equipment such as conventional SEP in fixed-sites, pharmacy-based distribution, dispensing machines (that either sell injecting equipment, provide it for free or in exchange for used equipment) and outreach programmes – often using a mobile van or bus and sometimes through home-visits (29).

### Fixed-sites

Fixed-sites SEP are usually set up near places where drugs are bought and sold openly (“drug scene”) or with a large number of IDU. Determining optimal locations for fixed sites is crucial for SEP effectiveness. The location of fixed-sites determines, to a large extent, the likelihood that IDU will use the services.

At a fixed-site it is also easy to offer additional services (*on-site*) such as health care, testing and counselling for HIV and hepatitis, treatment (e.g. antiretroviral, TB, OST), vaccination (hepatitis A and B), etc. (35).

### **Outreach Programmes (mobile vans or through home-visits or on the streets)**

Drug scenes change over time in terms of person, place, time and behaviour. Changes in the drug sellers, types of drugs available and/or sought, housing, police surveillance and arrest activities and other events can impact the drug scene (71).

This approach offers the potential to provide injecting equipment to hard-to-reach and high-risk individuals or IDU populations and in some cases act as a bridge to fixed-sites.

A mobile service can cover a larger geographic area, can more readily accommodate changes in local conditions and can offer a congenial environment that provides near anonymous access. Normally, a van generally follows a relatively consistent route, and parks at a predictable location at a predictable time, although it can change in response to immediate variations (e.g. police presence, neighbourhoods' conditions). Mobile services are often easier for local residents to cope with and can overcome opposition focused on a fixed site. Depending on the van's size and infrastructure, it can also provide some health-care services, testing and counselling for HIV and hepatitis, etc. (50).

At their simplest, outreach programmes through home-visits, involve a person going to a dwelling where there are IDU, ready to provide sterile injecting equipment, a sharps container for disposal of used needles and syringes and leaflets or other information. Often outreach programmes through home or street visits are set up to complement the work of fixed-site or mobile SEP when it is apparent that there is a number of injectors who are not making use of these services (35).

### **Community Pharmacies**

Community pharmacies have many benefits as locations for public-health interventions. Their convenient locations, extended days and hours of operation (their opening hours are often more convenient than those of fixed-site SEP) make them available to many people. These characteristics make them good locations for IDU to obtain sterile injecting equipment.

Community pharmacies can distribute sterile injecting equipment, through exchange schemes or sale (72-74).

### **Dispensing Machines**

Sale or exchange machines have been introduced as an attempt to provide a more convenient and available method of providing sterile injecting equipment to hidden and hard-to-reach IDU in an anonymous, private and non-stigmatized way. These machines are typically available 24 hours a day, seven days a week.

There are however criticisms of dispensing machines. One of the major concerns about sale or exchange dispensing machines is that they reduced staff-user contact, thus depriving IDU of information and education of safer

injecting and linkage to other services.

Sale or exchange machines should be located in an area where injecting is known to occur and where IDU can access the machine without fear of police surveillance or other harassment (75).

The coexistence of different modes of injecting equipment delivery, as well as tailoring services offered at different venues addresses several barriers that IDU encounter. Studies have suggested that different types of IDU make use of different syringe distribution channels (71, 75-78) and have indicated that the additional services provided by many SEP are especially important in attempts to reduce bloodborne infections and risk behaviours (39,79,80). Different modalities for improving syringe availability are complementary and not competitive (78).

Some studies have attempted to evaluate whether different types of modalities of SEP attract different profiles of IDU. For example, Obadia *et al* surveyed 343 IDU at SEP, pharmacies and vending machines sites in Marseille, France, and found that that 21.3% reported vending machines as their primary source of syringes. Those IDU were significantly more likely to be younger than 30 years old, never have received maintenance treatment and significantly less likely to report a positive HIV test. The authors concluded that vending machines might reach IDU who are less likely to attend SEP or pharmacies (76). These findings were corroborated by Moatti *et al* (77).

Also, in prisons several models for the distribution of sterile injecting equipment have been used, including dispensing machines, hand-to-hand distribution by prison health care staff or by external community health workers (e.g. Non-Governmental Organizations) and distribution by prisoners trained as peer outreach workers (41,42).

In a different way, consumption rooms should also be mentioned as a model for distribution of sterile injecting equipment. Consumption rooms are protected places for hygienic consumption of pre-obtained drugs, under the supervision of trained staff. They constitute a highly specialised drugs service within a wider network of services for drug users, embedded in comprehensive local strategies to reach and fulfil a diverse range of individual and community needs that arise from drug use (67,68).

There is a large consensus that no single intervention will effectively prevent or control outbreaks or epidemics of blood borne infections related with injecting drug use, hence the need for a comprehensive package for prevention, treatment and care. HIV epidemics among injecting drug users can be averted, halted and reversed, if comprehensive HIV programmes targeting drug users are implemented (1,32).

A comprehensive package for prevention, treatment and care for injecting drug users, should include the following interventions: distribution of sterile injecting equipment, drug treatment maintenance (e.g. OST), voluntary HIV counselling and testing, anti-retroviral treatment, sexually transmitted infection prevention and treatment, condom programming for IDU and their sexual partners (including clients in the case of IDU sex workers), target

information, education and communication for IDU and partners, hepatitis diagnosis, treatment (hepatitis A, B and C) and vaccination (hepatitis A and B) and tuberculosis prevention, diagnosis and treatment (1,32,81-86).

IDU often have difficulty in accessing formal healthcare services, so that the "SEP environment" itself can be an important outlet for this comprehensive package. Of note, however many SEP clients failed to receive needed preventive services. For example, only 35% of California SEP clients in need of HIV testing had received it in the past six months, and only 17% of those in need of HCV testing had received it for the same period. Yet, the presence of preventive and health services will not result in improved community health if IDU in those communities do not receive in fact the needed services (80).

## COVERAGE AND DISPENSATION POLICY OF SYRINGE EXCHANGE PROGRAMMES

Scaling up and reaching high coverage on programmes targeting IDU has become a topic of global concern (87-89). However, the semantics of these terms, especially "coverage", has created confusion and there is no commonly accepted definition (90).

According to WHO, scaling up "*refers either to the geographical expansion of existing interventions or to diversification of the range of services*" and coverage is defined as "*the probability of receiving a necessary health intervention conditional on the presence of a health care need*" (91). In 2005, WHO further proposed five domains of coverage – availability, accessibility, affordability, acceptability and effective coverage (92).

Determinants of supply and demand of HIV/AIDS infection interventions defined by WHO are: availability (quality service delivery points established), accessibility (distance, time), affordability (monetary and other costs, opportunity costs), acceptability (gender, ethnicity, language), perceived needs (perception of a disease or health risk, belief that the intervention will make a difference) and perceived quality of care (diagnosis ability, choice of interventions, adherence) (92).

In recent years, researchers' questions have centred on "How should we?", "How can we achieve adequate coverage?" and "How much is enough?". In a report commissioned to investigate programmes and sites, in developing countries (37), UNAIDS defined "high coverage" as being "where more than 50% of IDU has been reached by one or more HIV-prevention programme".

Coverage targets were addressed by Des Jarlais *et al* (93), using a modified Delphi process to ascertain what were the essential activities needed to prevent and stabilize a HIV epidemic and the levels of coverage required to be effective. Regarding SEP the majority of the coverage estimates were that 20% to 33% of injections should be made with a needle and a syringe obtained from a program source (for free), although there was considerable overall range in this estimates, and a common belief that a high local HIV seroprevalence level might require higher levels

of coverage. In the latter, coverage was measured by the number of injections with syringes and needles obtained from a programme, while previous estimate of coverage (given by UNAIDS) focused on the percentage of IDU reached by preventions programmes.

A wide range of measures and definitions might be used. Coverage can be measured at the individual level (e.g. percentage of injections with a sterile needle and syringe), at population level (e.g. percentage of estimated population of IDU reached in a geographic area by a programme in a specific period), and regarding to services provided to an IDU population (addressing the fact that a spectrum of services is needed).

Another issue of coverage is the regularity with which IDU access services: reached vs. ever reached vs. reached on a regular basis by prevention programmes. Nonetheless, an IDU reached once in a year (or once in a lifetime) by a SEP is qualitatively different from an IDU reached every day for a year by the same SEP. Careful consideration is also necessary in the definitions of clients, e.g. the distinction between number of clients and number of contacts (32).

The definition of coverage measured at a population level requires several methodological considerations, the most important of which is related with the estimate of the drug injection population, although in many countries, the estimated denominator populations remains poor and primary data collection system for making such estimates are absent.

Quality and standards of those programmes are other topics that should be taken into account. Clearly it is not just the quantity but also the quality of programmes and services that impact on utilization of HIV prevention efforts (90).

Using the term "coverage" to represent all these aspects of individual and population utilization and access, mixed with the concepts of reach and the quality of services has led to understandable confusion on parts of governments, programmes and researchers.

There is a consensus that more work needs to be done in this area of research and that widely accepted, accurate definitions are needed to replace the global (and broadly misunderstood) single term "coverage" (93).

Several studies have found differences that in SEP operational characteristics are associated with health outcomes and risk behaviour patterns among IDU, such as client-level outcomes associated with injecting equipment dispensation policies (94-98).

The Centers for Diseases Control and Prevention (CDC) recommended that an IDU should use a sterile syringe for each injection and then safely dispose it (99), which emphasizes the need of 100% syringe coverage at individual level as a public health goal.

Bluthenthal and colleagues, using data acquired from a large cross-sectional sample of IDU (1577 IDU from 24 SEP in California), have calculated syringe coverage percentage for each client (coverage measured at individual level), where syringe coverage rates were calculated by the number of injections divided by the number of syringes



retained by SEP clients over a 30-day period and multiplied by 100. Coverage of 100% was defined and classified as an SEP client receiving as many syringes from the SEP as self-reported injections in the last 30 days. The study grouped IDU into four categories: 150% coverage or more, 100-149%, 50-99%, and less than 50% coverage. In a multivariate logistic regression, SEP clients with less than 50% of coverage had significantly higher odds of reporting syringe re-use (AOR=2.64; 95%CI=1.76, 3.95) and receptive (AOR=2.29; 95%CI=1.44, 3.63) and distributive (AOR=1.63; 95%CI=1.07, 2.49) syringe sharing and those with 150% or more coverage had lower odds of reporting syringe re-use (AOR=0.49; 95%CI=0.33, 0.72) and receptive (AOR=0.47; 95%CI=0.28, 0.80) and distributive (AOR=0.46; 95%CI=0.29, 0.72) syringe sharing as compared to SEP clients with 100-149% coverage (97).

Using the same data acquired from 24 SEP in California, Bluthenthal *et al* in another study determined if client syringe coverage (defined in the same way as in the previous study) differed significantly by syringe dispensation policy (which were, ranging from the least to the most restrictive: unlimited needs-based distribution, unlimited one-for-one exchange plus a few additional syringes, limited one-for-one plus a few additional syringes, unlimited one-for-one exchange and limited one-for-one exchange) and found that SEP that provided less restrictive dispensation policies were associated with increased prevalence of adequate syringe coverage among clients (measured at a client-level) (98).

The dynamic between sterile syringes availability and the probability of infection through use of contaminated syringes depends also on the rate at which contaminated syringes are removed from the community. "Circulation theory" argues that SEP must balance the number of syringes distributed with syringes returned. Facilitating the turnaround of syringes reduces circulation time, thereby reduces the time syringes availability for sharing (100,101) and unsafe syringe disposal (streets, parks, schoolyards, etc.) (102). On the one hand a strict exchange policy may minimize the number of abandoned and possibly infected needles and syringes. However, on the other hand, a strict "one-for-one" policy could increase the likelihood of re-use and sharing injecting equipment (97,98,103).

Beyond the rationale of exchange, the proponents of restrictive dispensation policies (limits on the number of syringes and strict "one-for-one" policy) have asserted that this approach is an ideal way to maintain direct contact to IDU and provide referrals to other services and information on safe injections practices (80,104).

It is argued that merely distributing syringes without personal contact is a missed opportunity for intervention. Though in an attempt to achieve direct contact with each IDU, some SEP have actively discouraged secondary exchange (SE) (SE of needles and syringes refers to the giving or receiving of new sterile syringes and needles to/from another individual that were originally obtain from formal SEP. It can include trading, purchasing or selling for money, commodities or services, or it can simply involve the giving or receiving of syringes outright) (105). How-

ever, opposition to SE inhibits the distribution of sterile equipment to IDU who do not frequently attend SEP, and consequently could limit SEP effectiveness (106,107). Capping the number of syringes provided to IDU per visit is counterproductive (94).

Californian data indicated that 75% of clients of SEP reported engaging in SE in the previous six months (108) and in USA 93% of SEP allowed SE (63). Ultimately, however, programmes that discourage SE cannot truly prevent it. For example, in a comparison of two Canadian SEP with opposing SE policies, rates of SE were virtually identical (109).

Overall, laws, operational protocols and policies for SEP which consider limiting the number of syringes that can be distributed, sold or exchanged have been developed without the benefit of empirical data or even strong theoretical perspective to guide police and protocol choices (98), although they are a common practice in many implemented SEP in the world (72,73,96,97,110-113).

## EFFECTIVENESS OF SYRINGE EXCHANGE PROGRAMMES

The effectiveness of SEP to prevent HIV among IDU has been discussed intensely for more than 20 years.

There is evidence that increasing the availability and utilization of sterile injecting equipment by IDU reduces HIV infection - effectively, safely and in a cost-effective way. The first international review of the evidence that SEP reduce HIV infection among IDU found that conservative interpretation of the published data fulfilled six of the nine Bradford-Hill criteria (strength of association, replication of findings, temporal sequence, biological plausibility, coherence of evidence and reasoning by analogy) and all six additional criteria (cost-effectiveness, absence of consequences, feasibility of implementation, expansion and coverage, unanticipated benefits, and application to special populations) (20,29,34).

One could argue that the ideal study design to examine the SEP efficacy is a randomised clinical trial of IDU in a community that has or has not access to SEP. However, conducting a randomised clinical trial to evaluate SEP is almost impossible due to insuperable ethical and logistical problems.

In the absence of a randomisation other methodological problems arise including the accurate measures of needle and syringe sharing and injecting frequency. In addition, evaluations studies are generally conducted at different stages of epidemic (with wide variations in seroprevalence and seroincidence) (34), and with different confounding factors, internal or external to the programme, that influence the effectiveness of SEP: duration and sustainability, law enforcement, dispensation policies, location of the programme, etc. (61,98,114).

Surveillance data on HIV infections, as often limited to passive case reporting, is generally inadequate to the task of estimating the impact of preventive interventions such as SEP. Even if comprehensive surveillance data

is available, it would rarely identify the moment when infection occurred (87). A notification scheme will thus not provide the actual incidence, but rather the cumulative incidence over several years (115). Even with surveillance data based on the year of diagnosis, estimates should be made with caution; for example increases in the number of IDU could be the result of better sentinel surveillance in this group. On the other hand, decreases could be the result of increased stigmatisation and reluctance of IDU to be tested (32). Due to these difficulties most attempts in this direction have involved mathematical modeling which estimate the incidence using a combination of behavioural, transmission and SEP data.

Selection (self-referral) bias has fuelled the debate concerning the possibility of SEP actually causing an increase in bloodborne virus infection. Canadian studies in Montreal and Vancouver showed increases in HIV incidence and prevalence among SEP participants relative to non participants or frequent vs infrequent attendees (79,116). Nonetheless, these results were due to selection factors that lead high risk IDU to be over-represented among SEP attendees.

Given the confusion created by these studies, the relationship between frequent syringe exchange attendance and HIV incidence was evaluated by the same authors in a Vancouver follow-up study. It was demonstrated that the number of HIV seroconversions observed among frequent vs. infrequent SEP attendees could be predicted solely on the basis of their higher baseline risk profile. Selection factors in that case could entirely explain the observed disparity in HIV incidence rates based on SEP attendance. Frequent SEP attendees were more likely than non-frequent SEP attendees to live in unstable housing, to inject frequently, inject cocaine, exchange sex for money, inject in "shooting galleries" and to have recently been incarcerated (117). This explanation was also corroborated by Evan Wood *et al* who demonstrated that differential HIV incidence rates between frequent vs. infrequent SEP attendees were due to the higher consumption of cocaine among daily attendees (118).

However, SEP were criticised for promoting unsafe injecting drug use behaviour, and at that time it was postulated by politicians and opponents that SEP could act as a focus for forming social networks conducive to the initiation into unsafe injecting practices. Actually, the results were misinterpreted and misused as an evidence of a casual link between SEP and HIV seroconversion, leading to continued ban on the use of USA federal funds to support SEP (64,116). United Nations Office on Drugs and Crime (UNODC) was for years barred from funding syringe exchange due to objections from the United States and only recently has begun offering limited support. UN-AIDS and WHO, by contrast, have expressed consistent support for programmes providing sterile injection equipment to reduce HIV infections (119).

## BARRIERS TO USE SYRINGE EXCHANGE PROGRAMMES

Understanding barriers to SEP and preferences of IDU, including those who do not attend SEP, is essential to providing services which better meet the needs of IDU and in developing alternative programmes of distributions or modifying some operational characteristics of the existing SEP (120-122).

SEP are extremely diverse in their design, staffing, characteristics of participants, operation and program delivery policies, and legal, social, cultural and economic environments in the community (123-124). As such, the ability of any given SEP to reach its clientele will be dependent on these factors. Barriers to SEP access have been associated with lack of awareness (121), inconvenient location (studies suggested that the willingness of IDU to use a SEP declines significantly if SEP is more distant than a 10 minutes-walk) (125), limited hours of programme operation: "*drug use is not confined to a nine-to-five schedule*" (50,75), dispensation policies (96) and stigma associated with being identified as an IDU (126).

As above mentioned, legal factors, such as laws, regulations and policing practices represent other important structural factors on access to SEP. Laws and regulations controlling access to needles and syringes, intended to discourage injection drug use, have resulted in an artificial scarcity of sterile injection equipment for IDU (127) and further stigmatization of this group (44,128). The difficulty faced by IDU in the procurement of sterile injecting equipment and the fear of arrest has encouraged the multiperson use and reuse of syringes and needles (95,112,114,129,130).

Several interrelated laws and regulations restrict IDU's ability or willingness to obtain and possess injecting equipment, such as the following (131):

- Drug paraphernalia laws: laws which establish criminal penalties for the manufacture, sale, distribution, possession, or advertisement of any item used to produce and consume illegal drugs, including needles and syringes;
- Syringe prescription laws: laws which prohibit dispensing or possessing syringes without a medical prescription;
- Pharmacy regulations and practices guidelines: as part of their oversight responsibilities, state boards of pharmacy develop and enforce regulations and guidelines that cover many aspects of syringe sales, such as: display, advertising, record keeping, limits on syringes that can be purchased, customer identification and assessments of client's probable use;
- Restrictions on SEP: existence of syringe prescription and drug laws paraphernalia effectively restrict the ability of SEP to operate unless they are specifically exempted from the laws.

In 2004, 43 states of USA and the District of Columbia had drug paraphernalia laws and five states had syringes



prescription laws (94). Access to sterile equipment (including sales and carrying of drug injection equipment) has been illegal also in Sweden except for two SEP in low HIV prevalence areas (Lund and Malmö – SEP are operating on a trial basis since 1986 and 1987, respectively) (111).

In addition to legal and regulatory barriers, the individual attitudes and moral beliefs of SEP providers, including pharmacists, affect syringe sales and distribution, and must be addressed when designing interventions to improve injection drug user access to sterile injecting equipment (113,132-134).

Regarding pharmacy sales or distribution; unclear laws and pharmacists who are uncertain as to their interpretation may also constitute continuing barriers to injecting equipment access for IDU (113,135). In several countries, possessing syringes puts IDU at risk of police searches, arrest and criminal prosecution. Hence, IDU can be reluctant to participate in sterile injecting equipment access such as SEP or pharmacy sales. Legalizing over-the-counter syringe sales and SEP without legalizing possession of syringes for IDU is likely to impede the public health benefits of such policy changes.

In Portugal distribution (without medical prescription) and possession of injecting equipment (that includes not only needles and syringes, but the whole paraphernalia injection equipment) is legal.

The legal framework in place since July 2001 (Law no. 30/2000, of 29th November) (136), although decriminalising illicit drug use, maintains drug use as an illicit behaviour and also maintains the illegal status for all drugs included in the relevant United Nations Conventions. However, a person caught in possession of a quantity of drugs for personal use (up to a maximum amount of drug required to a consumption period of 10 days), without any suspicion of being involved in drug trafficking, will be evaluated by a local Commission for Drug Addiction Dissuasion composed of a lawyer, a medical doctor and a social worker. Sanctions can be applied, but the main objective is to explore the need for treatment and to promote healthy recovery (136,137).

IDU are diverse populations with different languages, cultures, sexual preferences, life circumstances, behaviours, and requirements for services. Some efforts to identify structural, individual and environmental barriers to optimal sterile injecting equipment programmes have been done. However, the challenge of implementing effective strategies to address these concerns remains a priority.

## REFERENCES

- 1 - Institute of Medicine of the National Academy of Sciences. Preventing HIV Infection among injecting drug users in high risk countries: an assessment of evidence. Washington, D.C: IOM, 2006.
- 2 - European Monitoring Centre for Drugs and Drug Addiction. 2008 Annual report: the state of the drugs problem in Europe. Lisbon: EMCDDA, 2008.
- 3 - Mathers BM, Degenhardt L, Phillips B, et al; 2007 Reference Group to the UN on HIV and Injecting Drug Use. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *Lancet*. 2008 15;372:1733-45.
- 4 - Aceijas C, Stimson GV, Hickman M, Rhodes T; United Nations Reference Group on HIV/AIDS Prevention and Care among IDU in Developing and Transitional Countries. Global overview of injecting drug use and HIV infection among injecting drug users. *AIDS*. 2004 19;18:2295-303.
- 5 - World Health Organization. Hepatitis C in viral cancers. Available from: [http://www.who.int/vaccine\\_research/diseases/viral\\_cancers/en/index2.html](http://www.who.int/vaccine_research/diseases/viral_cancers/en/index2.html) (Accessed: December 2008).
- 6 - Shepard CW, Finelli L, Alter MJ. Global epidemiology of hepatitis C virus infection. *Lancet Infect Dis* 2005;5:558-67.
- 7 - Joint United Nations Programme on HIV/AIDS. 2008 Report on the global AIDS epidemic. Geneva: UNAIDS, 2008.
- 8 - Murray JM, Law MG, Gao Z, Kaldor JM. The impact of behavioural changes on the prevalence of human immunodeficiency virus and hepatitis C among injecting drug users. *Int J Epidemiol* 2003;32:708-14.
- 9 - Cox J, De P, Morissette C, Tremblay C, Stephenson R, Allard R, Graves L, Roy E. Low perceived benefits and self-efficacy are associated with hepatitis C virus (HCV) infection-related risk among injection drug users. *Soc Sci Med* 2008;66:211-20.
- 10 - Heinzerling KG, Kral AH, Flynn NM, Anderson RL, Scott A, Gilbert ML, Asch SM, Bluthenthal RN. Human immunodeficiency virus and hepatitis C virus testing services at syringe exchange programs: availability and outcomes. *J Subst Abuse Treat* 2007;32:423-9.
- 11 - Morissette C, Cox J, De P, Tremblay C, Roy E, Allard R, Stephenson R, Graves L. Minimal uptake of sterile drug preparation equipment in a predominantly cocaine injecting population: implications for HIV and hepatitis C prevention. *Int J Drug Policy* 2007;18:204-12.
- 12 - Thiede H, Hagan H, Campbell JV, et al; DUIT Study Team. Prevalence and correlates of indirect sharing practices among young adult injection drug users in five U.S. cities. *Drug Alcohol Depend*. 2007;91 (Suppl 1):S39-47.
- 13 - Thorpe LE, Ouellet LJ, Hershow R, et al. Risk of hepatitis C virus infection among young adult injection drug users who share injection equipment. *American Journal of Epidemiology* 2002;155:645-53.
- 14 - Hagan H, Thiede H, Weiss NS, Hopkins SG, Duchin JS, Alexander ER. Sharing of drug preparation equipment as a risk factor for hepatitis C. *Am J Public Health* 2001;91:42-6.
- 15 - Alter MJ. Epidemiology of hepatitis C virus infection. *World J Gastroenterol* 2007;13:2436-41.
- 16 - Wiessing L, Nardone A. Ongoing HIV and viral hepatitis infections in IDUs across the EU, 2001-2005. *Euro Surveill*. 2006;11.
- 17 - Arasteh K, Des Jarlais DC. Injecting drug use, HIV, and what to do about it. *Lancet* 2008;372:1709-10.
- 18 - Wiessing L, van de Laar MJ, Donoghoe MC, Guarita B, Klempová D, Griffiths P. HIV among injecting drug users in Europe: increasing trends in the East. *Euro Surveill*. 2008;13.

- 19 - Joint United Nations Programme on HIV/AIDS. 2006 Report on the global AIDS epidemic. Geneva: UNAIDS, 2006.
- 20 - Wodak A, Cooney A. Do needle syringe programs reduce HIV infection among injecting drug users: a comprehensive review of the international evidence. *Subst Use Misuse* 2006;41:777-813.
- 21 - Bogart LM, Kral AH, Scott A, et al. Condom attitudes and behaviors among injection drug users participating in California syringe exchange programs. *AIDS Behav* 2005;9:423-32.
- 22 - Kral AH, Bluthenthal RN, Lorvick J, Gee L, Bacchetti P, Edlin BR: Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: risk-factor analysis. *Lancet* 2001;357:1397-401.
- 23 - Stratthdee SA, Sherman SG: The role of sexual transmission of HIV infection among injection and non-injection drug users. *J Urban Health* 2003;80:iii7-iii14.
- 24 - Lindenburg CE, Krol A, Smit C, Buster MC, Coutinho RA, Prins M. Decline in HIV incidence and injecting, but not in sexual risk behaviour, seen in drug users in Amsterdam: a 19-year prospective cohort study. *AIDS* 2006;20:1771-5.
- 25 - Kerr T, Stoltz JA, Stratthdee S, et al. The impact of sex partners' HIV status on HIV seroconversion in a prospective cohort of injection drug users. *J Acquir Immune Defic Syndr* 2006;41:119-23.
- 26 - European Centre for Disease Prevention and Control/WHO Regional Office for Europe: HIV/AIDS surveillance in Europe 2007. Stockholm: ECDC, 2008.
- 27 - European Monitoring Centre for Drugs and Drug Addiction. 2007 Annual report: the state of the drugs problem in Europe. Lisbon: EMCDDA, 2007.
- 28 - United Nations. Declaration of Commitment on HIV/AIDS – United Nations Special Session on HIV/AIDS. Resolution A/RES/S-26/2 adopted by the UN General Assembly twenty-sixth special session, June 25-27, 2001. Available from: [www.un.org/ga/aids/docs/aress262.pdf](http://www.un.org/ga/aids/docs/aress262.pdf) (Accessed: December 2008).
- 29 - World Health Organization. Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users. Geneva: WHO, 2004.
- 30 - Dublin Declaration on Partnership to fight HIV/AIDS in Europe and Central Asia. Available from: [http://www.euro.who.int/aids/treatment/20051018\\_1](http://www.euro.who.int/aids/treatment/20051018_1) (Accessed: March 2009).
- 31 - Gibson DR, Flynn NM, Perales D. Effectiveness of syringe exchange programs in reducing HIV risk behavior and HIV seroconversion among injecting drug users. *AIDS* 2001;15:1329-41.
- 32 - Donoghoe MC, Verster A, Pervilhac C, Williams P. Setting targets for universal access to HIV prevention, treatment and care for injecting drug users (IDUs): towards consensus and improved guidance. *Int J Drug Policy* 2008;19 (Suppl 1):S5-14.
- 33 - Wodak A. Lessons from the first international review of the evidence for needle syringe programs: the band still plays on. *Subst Use Misuse* 2006;41:837-9.
- 34 - Wodak A, Cooney A. Effectiveness of sterile needle and syringe programmes. *Int J Drug Policy* 16 S(2005) S 31-S44.
- 35 - World Health Organization, United Nations Office on Drugs and Crime, Joint United Nations Programme on HIV/AIDS. Guide to starting and managing needle and syringe programmes. Geneva: WHO, UNDOC, UNAIDS, 2007.
- 36 - Bravo MJ, Royuela L, Barrio G, de la Fuente L, Suarez M, Teresa Brugal M. More free syringes, fewer drug injectors in the case of Spain. *Soc Sci Med* 2007;65:1773-8.
- 37 - Joint United Nations Programme on HIV/AIDS. High Coverage Sites. HIV prevention among injecting drug users in transitional and developing countries (Case studies). UN-AIDS Best Practice Collection. Geneva: UNAIDS, 2006.
- 38 - Aceijas C, Hickman M, Donoghoe MC, Burrows D, Stuijke R. Access and coverage of needle and syringe programmes (NSP) in Central and Eastern Europe and Central Asia. *Addiction* 2007;102:1244-50.
- 39 - Bedell R. The art and the science of scaling-up needle and syringe programmes. *Addiction* 2007;102:1179-80.
- 40 - World Health Organization Regional Office for Europe. Health in prisons - A WHO guide to the essentials in prison health. Copenhagen: WHO, 2007.
- 41 - World Health Organization, United Nations Office on Drugs and Crime, Joint United Nations Programme on HIV/AIDS. Effectiveness of Interventions to Address HIV in Prisons – Drug Dependence Treatments. Evidence for Action Technical Paper. Geneva: WHO, UNDOC, UNAIDS, 2007.
- 42 - Canadian HIV/AIDS Legal Network. Prison needle exchange: lessons from a comprehensive review of international evidence and experience. Canada: Canadian HIV/AIDS Legal Network, 2006.
- 43 - Centers for Disease Control and Prevention. Current trends update on Acquired Immune Deficiency Syndrome (AIDS) – United States. *MMWR Morb Mortal Wkly Rep* 1982; 31:507-8;513-4.
- 44 - Des Jarlais, Friedman SR. Fifteen years of research on preventing HIV infection among injecting drug users: What we have learned, what we have not learned, what we have done, what we have not done. *Public Health Reports*. June 1998;113 (Suppl 1):182-8.
- 45 - Vlahov D, Des Jarlais DC, Goosby E, et al. Needle exchange programs for the prevention of human immunodeficiency virus infection: epidemiology and policy. *Am J Epidemiol* 2001;154(Suppl 12):S70-S77.
- 46 - Burns SM, Brett RP, Gore SM, Peutherer JF, Robertson JR. The epidemiology of HIV infection in Edinburgh related to the injecting of drugs: an historical perspective and new insight regarding the past incidence of HIV infection derived from retrospective HIV antibody testing of stored samples of serum. *J Infect* 1996;32:53-62.
- 47 - Centers for Disease Control and Prevention. Current trends update on Acquired Immune Deficiency Syndrome (AIDS) – United States. *MMWR Morb Mortal Wkly Rep* 1982; 31:507-8;513-4.
- 48 - van den Hoek JA, van Haastrecht HJ, Coutinho RA. Risk reduction among intravenous drug users in Amsterdam under the influence of AIDS. *Am J Public Health* 1989;79:1355-7.
- 49 - Witteveen E, Schippers G. Needle and syringe exchange programs in Amsterdam. *Subst Use Misuse* 2006;41:835-6.
- 50 - Islam MM, Conigrave KM. Assessing the role of syringe dispensing machines and mobile van outlets in reaching hard-to-reach and high-risk groups of injecting drug users (IDUs): a review. *Harm Reduct J* 2007;24:4:14.
- 51 - Myers T, Cockerill R, Worthington C, Millson M, Rankin J. Community pharmacist perspectives on HIV/AIDS and interventions for injection drug users in Canada. *AIDS Care* 1998;10:689-700.

- 52 - Keene J, Stimson GV, Jones S, Parry-Langdon N. Evaluation of syringe-exchange for HIV prevention among injecting drug users in rural and urban areas of Wales. *Addiction* 1993;88:1063-70.
- 53 - Glantz A, Bynie C, Jackson P. Role of community pharmacies in prevention of AIDS among injecting drug misusers: findings of a survey in England and Wales. *BMJ* 1989;299:1076-9.
- 54 - Lurie P, Drucker E. An opportunity lost: HIV infections associated with lack of a national needle exchange programme in the USA. *Lancet* 1997; 349:604-8.
- 55 - European Monitoring Centre for Drugs and Drug Addiction. Statistical bulletin 2008: Table HSR-4. Year of introduction of needle and syringes programmes and types of programmes available in 2006. Available from EMCDDA: [www.emcdda.europa.eu/stats08/hsrtab4](http://www.emcdda.europa.eu/stats08/hsrtab4) (Accessed: December 2008)
- 56 - Hurley SF, Jolley DJ, Kaldor JM. Effectiveness of needle-exchange programmes for prevention of HIV infection. *Lancet* 1997;349:1797-800.
- 57 - Center for Health Improvement. Policy Brief. Syringe exchange in California: policy, programs and progress. CHI: Sacramento, 2007.
- 58 - Tempalski B. Placing the dynamics of syringe exchange programs in the United States. *Health Place* 2007;13:417-31.
- 59 - Tempalski B, Flom PL, Friedman SR, et al. Social and political factors predicting the presence of syringe exchange programs in 96 US metropolitan areas. *Am J Public Health* 2007;97:437-47.
- 60 - Tempalski B, Friedman S, Des Jarlais DC, McKnight C. What predicts which metropolitan areas in the USA have syringes exchanges? *Int J Drug Policy* 2003;14:417-24.
- 61 - Amundsen EJ. Measuring effectiveness of needle and syringe exchange programmes for prevention of HIV among injecting drug users. *Addiction* 2006;101:911-2.
- 62 - Centers for Disease Control and Prevention. Syringe exchange programs--United States, 1994-1995. *MMWR Morb Mortal Wkly Rep* 1995;44:684-5,691.
- 63 - Centers for Disease Control and Prevention. Syringe exchange programs--United States, 2005. *MMWR Morb Mortal Wkly Rep* 2007;56:1164-7.
- 64 - Moss AR. Epidemiology and the politics of needle exchange. *Am J Public Health* 2000;90:1385-7.
- 65 - George W. Bush. Response of Governor George W. Bush to the AIDS Foundation of Chicago. 2000. Available from: [http://www.aidschicago.org/pdf/GWB\\_response.pdf](http://www.aidschicago.org/pdf/GWB_response.pdf) (Accessed: December 2008).
- 66 - Bastos F. Sterile syringe access for injection drug users in the first 21st century: progress and prospects. *Int J Drug Policy* 2003;14:351-2.
- 67 - Kerr T, Tyndall MW, Zhang R, Lai C, Montaner JS, Wood E. Circumstances of first injection among illicit drug users accessing a medically supervised safer injection facility. *Am J Public Health* 2007;97:1228-30.
- 68 - European Monitoring Centre for Drugs and Drug Addiction. European report on drug consumption rooms. Lisbon: EMCDDA, 2004.
- 69 - Lloyd C, Hunt N. Drug consumption rooms: an overdue extension to harm reduction policy in the UK?. *Int J Drug Policy*. 2007.
- 70 - Decreto-Lei nº 183/2001, de 21 de Junho.
- 71 - Klein SJ, Candelas AR, Birkhead GS. Mobilizing public and private partners to support New York's Expanded Syringe Access Demonstration Program. *J Am Pharm Assoc (Wash)* 2002;42(6 Suppl 2):S28-9.
- 72 - Deibert RJ, Goldbaum G, Parker TR, et al. Increased access to unrestricted pharmacy sales of syringes in Seattle-King County, Washington: structural and individual-level changes, 1996 versus 2003. *Am J Public Health* 2006;96:1347-53.
- 73 - Samitca S, Huissoud T, Jeannin A, Dubois-Arber F. The role of pharmacies in the care of drug users: what has changed in ten years. The case of a Swiss region. *Eur Addict Res* 2007;13:50-6.
- 74 - Matheson C, Bond CM, Tinelli M. Community pharmacy harm reduction services for drug misusers: national service delivery and professional attitude development over a decade in Scotland. *J Public Health (Oxf)* 2007;29:350-7.
- 75 - Islam M, Wodak A, Conigrave KM. The effectiveness and safety of syringe vending machines as a component of needle syringe programmes in community settings. *Int J Drug Policy*. 2008.
- 76 - Obadia Yoland et al. Syringe Vending machines for injecting drug users: an experiment in Marseille, France. *American Journal of Public Health* 1999;89:1852-4.
- 77 - Moatti JP, Vlahov D, Feroni I, Perrin V, Obadia Y. Multiple access to sterile syringes for injection drug users: vending machines, needle exchange programs and legal pharmacy sales in Marseille, France. *Eur Addict Res* 2001;7:40-5.
- 78 - Coffin P. Syringe availability as HIV prevention: a review of modalities. *J Urban Health* 2000;77:306-30.
- 79 - Strathdee S, Patrick D, Currie SL, et al. Needle exchange is not enough: lessons from the Vancouver injection drug use study. *AIDS* 1997;11; F59-F65.
- 80 - Heinzerling KG, Kral AH, Flynn NM, et al. Unmet need for recommended preventive health services among clients of California syringe exchange programs: implications for quality improvement. *Drug Alcohol Depend* 2006;81:167-78.
- 81 - World Health Organization, United Nations Office on Drugs and Crime, Joint United Nations Programme on HIV/AIDS. Policy guidelines for collaborative TB and HIV services for injecting and other drug users – an integrated approach. Geneva: WHO, UNDOC, UNAIDS, 2008.
- 82 - AIDS Project Management Group. Proceedings of the APMG satellite session on coverage of harm reduction programs at 17th international conference on the reduction of drug-related harm, Vancouver 2 May. Sydney/Geneva. 2006. Available from: <http://www.aidsprojects.com/uploads/pdf/76.pdf> (Accessed: December 2008).
- 83 - Winter R, Nguyen O, Higgs P, et al. Integrating enhanced hepatitis C testing and counselling in research. *Int J Drug Policy* 2008;19:66-70.
- 84 - Birkhead GS, Klein SJ, Candelas AR, et al. Integrating multiple programme and policy approaches to hepatitis C prevention and care for injection drug users: a comprehensive approach. *Int J Drug Policy* 2007;18:417-25.
- 85 - World Health Organization. Technical meeting for the development of a framework for universal access to HIV/AIDS prevention, treatment and care in the health sector. Geneva: WHO, 2005.
- 86 - Aggleton P, Jenkins P, Malcolm A. HIV/AIDS and injecting drug use: information, education and communication. *Int J Drug Policy* 2005;16S:S21-S30.
- 87 - Heimer R. Community coverage and HIV prevention: assessing metrics for estimating HIV incidence through syringe exchange. *Int J Drug Policy* 2008;19 (Suppl 1): S65-73.
- 88 - Gray R, Hoffman L. Tracking coverage on the silk road: time to turn theory into practice. *Int J Drug Policy* 2008;19 (Suppl 1):S15-24.



- 89 - Burrows D. Rethinking coverage of needle exchange programs. *Subst Use Misuse* 2006;41:1045-8.
- 90 - Sharma M, Burrows D, Bluthenthal R. Coverage of HIV prevention programmes for injection drug users: confusions, aspirations, definitions and ways forward. *Int J Drug Policy* 2007;18:92-8.
- 91 - World Health Organization. Background for the technical consultation on effective coverage of health systems, 27-29 August 2001. Geneva: WHO, 2001. Available from: <http://www.who.int/health-systems-performance/technical-consultations/effcov-background.pdf> (Accessed: November 2008).
- 92 - World Health Organization. Technical meeting for the development of a framework for universal access to HIV/AIDS prevention, treatment and care in the health sector. Geneva: WHO, 2005.
- 93 - Des Jarlais DC, Burrows D, Friedman S. Experts' estimates of coverage needed for interventions to control HIV transmission among injecting drug users. 2007. Available from: [http://www.soros.org/initiatives/health/focus/ihrd/articles\\_publications/articles/experts\\_20070501/experts\\_20070501.pdf](http://www.soros.org/initiatives/health/focus/ihrd/articles_publications/articles/experts_20070501/experts_20070501.pdf) (Accessed: November 2008).
- 94 - Bluthenthal RN, Malik MR, Grau LE, Singer M, Marshall P, Heimer R. Diffusion of Benefit through Syringe Exchange Study Team. Sterile syringe access conditions and variations in HIV risk among drug injectors in three cities. *Addiction* 2004;99:1136-46.
- 95 - Heimer R, Clair S, Teng W, Grau LE, Khoshnood K, Singer M. Effects of increasing syringe availability on syringe-exchange use and HIV risk: Connecticut, 1990-2001. *J Urban Health* 2002;79:556-70.
- 96 - Kral AH, Anderson R, Flynn NM, Bluthenthal RN. Injection risk behaviors among clients of syringe exchange programs with different syringe dispensation policies. *J Acquir Immune Defic Syndr* 2004;37:1307-12.
- 97 - Bluthenthal RN, Anderson R, Flynn NM, Kral AH. Higher syringe coverage is associated with lower odds of HIV risk and does not increase unsafe syringe disposal among syringe exchange program clients. *Drug Alcohol Depend* 2007;89:214-22.
- 98 - Bluthenthal RN, Ridgeway G, Schell T, Anderson R, Flynn NM, Kral AH. Examination of the association between syringe exchange program (SEP) dispensation policy and SEP client-level syringe coverage among injection drug users. *Addiction* 2007;102:638-46.
- 99 - Centers for Disease Control and Prevention. New attitudes and strategies: a comprehensive approach to preventing blood-borne infections among IDU. Atlanta, GA: CDC, 2001.
- 100 - Heimer R, Kaplan EH, Khoshnood K, Jariwala B, Cadman EC. Needle exchange decreases the prevalence of HIV-1 proviral DNA in returned syringes in New Haven, Connecticut. *Am J Med*. 1993;95:214-220.
- 101 - Kaplan EH, Heimer R. A circulation theory of needle exchange. *AIDS*. 1994 May;8(5):567-74.
- 102 - Cabases JM, Sanchez E. Costs and effectiveness of a syringe distribution and needle exchange program for HIV prevention in a regional setting. *Eur J Health Econ* 2003;4:203-8.
- 103 - Heimer R, Khoshnood K, Bigg D, Guydish J, Junge B. Syringe use and reuse: effects of syringe exchange programs in four cities. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;18 (Suppl 1):S37-44.
- 104 - Cao W, Treloar C. Comparison of needle and syringe programme attendees and non-attendees from a high drug-using area in Sydney, New South Wales. *Drug Alcohol Rev* 2006;25:439-44.
- 105 - Bryant J, Hopwood M. Secondary exchange of sterile injecting equipment in a high distribution environment: A mixed method analysis in south east Sydney, Australia. *Int J Drug Policy* 2008.
- 106 - Bastos FI, Strathdee SA. Evaluating effectiveness of syringe exchange programmes: current issues and future prospects. *Soc Sci Med* 2000;51:1771-82.
- 107 - Kleinig J. Thinking ethically about needle and syringe programs. *Subst Use Misuse* 2006;41:815-25.
- 108 - Lorvick J, Bluthenthal RN, Scott A, et al. Secondary syringe exchange among users of 23 California syringe exchange programs. *Subst Use Misuse* 2006;41:865-82.
- 109 - Tyndall MW, Bruneau J, Brogly S, Spittal P, O'Shaughnessy, MV, Schechter MT. Satellite needle distribution among injection drug users: policy and practice in two canadian cities. *Journal of Acquired Immune Deficiency Syndromes* 2002;31:98-105.
- 110 - Scottish Executive Social Research. Substance Misuse Research Programme Needle exchanges Provision in Scotland: a report of the national needle exchange survey. Scottish Executive, 2006.
- 111 - Amundsen EJ, Eskild A, Stigum H, Smith E, Aalen O. Legal access to needles and syringes/needle exchange programmes versus HIV counselling and testing to prevent transmission of HIV among intravenous drug users: a comparative study of Denmark, Norway and Sweden. *Eur J Public Health* 2003;13:252-8.
- 112 - Wood E, Tyndall MW, Spittal PM, et al. Factors associated with persistent high-risk syringe sharing in the presence of an established needle exchange programme. *AIDS*. 2002;16:941-943.
- 113 - Taussig JA, Weinstein B, Burris S, Jones TS. Syringe laws and pharmacy regulations are structural constraints on HIV prevention in the US. *AIDS* 2000;14 (Suppl 1):S47-51.
- 114 - Neaigus A, Zhao M, Gyarmathy VA, Cisek L, Friedman SR, Baxter RC. Greater drug injecting risk for HIV, HBV, and HCV infection in a city where syringe exchange and pharmacy syringe distribution are illegal. *J Urban Health* 2008;85:309-22.
- 115 - Gieseck J. *Modern Infectious Disease Epidemiology*. Second edition. Oxford University Press Inc, 2002.
- 116 - Bruneau J, Lamothe F, Franco E, et al. High rates of HIV infection among injection drug users participating in needle exchange programs in Montreal; results of a cohort study. *Am J Epidemiol* 1997;146:994-1002.
- 117 - Schechter MT, Strathdee SA, Cornelisse PG, et al. Do needle exchange programmes increase the spread of HIV among injection drug users?: an investigation of the Vancouver outbreak. *AIDS* 1999;13:F45-51.
- 118 - Wood E, Lloyd-Smith E, Li K, et al. Frequent needle exchange use and HIV incidence in Vancouver, Canada. *Am J Med* 2007;120:172-9.
- 119 - Open Society Institute. *International Harm Reduction Development. Illicit drugs policies and the global HIV epidemic – effects of UN and national government approaches*. New York, 2004. Available from: [http://www.soros.org/initiatives/health/focus/ihrd/articles\\_publications/publications/cnd\\_20040316/Illicit%20Drug%20Policy%20for%20web%20FINAL.pdf](http://www.soros.org/initiatives/health/focus/ihrd/articles_publications/publications/cnd_20040316/Illicit%20Drug%20Policy%20for%20web%20FINAL.pdf) (Accessed: December 2008).

- 120 - Des Jarlais DC, Braine N. Assessing syringe exchange programs. *Addiction* 2004;99:1081-2.
- 121 - Treloar C, Cao W. Barriers to use of Needle and Syringe Programmes in a high drug use area of Sydney, New South Wales. *Int J Drug Policy* 2005;16:308-15.
- 122 - Small W. Examining barriers to syringe access among injection drug users. *Int J Drug Policy* 2005;16:291-2.
- 123 - Spittal PM, Small W, Wood E, et al. How otherwise dedicated AIDS prevention workers come to support state-sponsored shortage of clean syringes in Vancouver, Canada. *International Journal of Drug Policy* 2003;15:36-45.
- 124 - Alex H. Kral: What is it about needle and syringe programmes that make them effective for preventing HIV transmission?. *Int J Drug Policy* 2003;14:361-3.
- 125 - Welton A, Adelberger K, Patterson K, Gilbert D. Optimal placement of syringe-exchange programs. *J Urban Health* 2004;81:268-77.
- 126 - Simmonds L, Coomber R. Injecting drug users: a stigmatised and stigmatizing population. *Int J Drug Policy* 2009;20:121-30.
- 127 - Gostin LO. The legal environment impeding access to sterile syringes and needles: the conflict between law enforcement and public health. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;18 (Suppl 1):S60-S70.
- 128 - Gleghorn, AA, Gee G, Vlahov D. Pharmacists' attitudes about pharmacy sale of needles/syringes and needle exchange programs in a city without needle/syringe prescription laws *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;18 (Suppl 1):S89-93.
- 129 - Wood E, Kerr T, Small W, Jones J, Schechter MT, Tyndall MW. The impact of a police presence on access to needle exchange programs. *J Acquir Immune Defic Syndr* 2003;34:116-8.
- 130 - Wood E, Tyndall MW, Spittal P, Li K, Hogg R, O'Shaughnessy M, Schechter M. Needle exchange and difficulty with needle access during an ongoing HIV epidemic. *Int J Drug Policy* 2002;13:95-102.
- 131 - Rich JD, Dickinson BP, Liu KL, et al. Strict syringe laws in Rhode Island are associated with high rates of reusing syringes and HIV risks among injection drug users. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;18(Suppl 1):S140-1.
- 132 - Lewis BA, Koester SK, Bush TW. Pharmacists' attitudes and concerns regarding syringe sales to injection drug users in Denver, Colorado. *J Am Pharm Assoc (Wash)* 2002;42(6 Suppl 2):S46-51.
- 133 - Rich JD, Martin EG, Macalino GE, Paul RV, McNamara S, Taylor LE. Pharmacist support for selling syringes without a prescription to injection drug users in Rhode Island. *J Am Pharm Assoc (Wash)* 2002;42(6 Suppl 2):S58-61.
- 134 - Matheson C, Bond CM, Mollison J: Attitudinal factors associated with community pharmacists' involvement in services for drug misusers. *Addiction* 1999;94:1349-59.
- 135 - Burris S, Vernick JS, Ditzler A, Stratthdee S. The legality of selling or giving syringes to injection drug users. *J Am Pharm Assoc (Wash)* 2002;42(6 Suppl 2):S13-8.
- 136 - Lei nº 30/2000, 29 de Novembro.
- 137 - Institute for Drug and Drug Addiction, I.P. 2007 National Report (2006 data) to the EMCDDA – Reitox National Focal Point – "Portugal" – New development, trends and in-depth information on selected issues. IDT, 2007

#### Correspondência:

Dr.<sup>a</sup> Carla Torre  
 Coordenação Nacional para a Infecção  
 VIH/sida  
 Palácio Bensaúde, Estrada da Luz, nº 153  
 1600-153 Lisboa

e-mail: ctorrinha@gmail.com