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.
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)\(^1\). 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

---

\(^1\) 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 “marketplace”, 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 prevent 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, Oregan, 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 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 obtain from a programme, while previous estimate of coverage (given by UNAIDS) focused on the percentage of IDU reached by prevention 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 lead 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 other 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). However, 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).

California 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 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 causal 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. UNAIDS 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 Malmo – 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


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.


Syringe Exchange Programmes in the Context of Harm Reduction


70 - Decreto-Lei n° 183/2001, de 21 de Junho.


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 illegal pharmacy sales in Marseille, France. Eur Addict Res 2001;7:40-5.


89 - Burrows D. Rethinking coverage of needle exchange programs. Subst Use Misuse 2006;41:1045-8.
107 - Kleinig J. Thinking ethically about needle and syringe programs. Subst Use Misuse 2006;41:815-25.


Alex H. Kral: What is it about needle and syringe programs that make them effective for preventing HIV transmission?. Int J Drug Policy 2003;14:361-3.


Lei nº 30/2000, 29 de Novembro.


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

e-mail: ctorrinha@gmail.com