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needle & syringe programs:
a review of the evidence

Dear Colleague

Needle and Syringe Programs have been at the centre of public discussion recently. This is not surprising. The provision of free needles and syringes challenges many people's sense of how best to deal with the issue of injecting drug use in the community, fearing that it gives the wrong message to impressionable young people. Others have an understandable concern regarding cost and improperly disposed needles.

The Australian National Council on AIDS, Hepatitis C and Related Diseases (ANCAHRD) has commissioned a review of the scientific evidence for and against Needle and Syringe Programs. Although each individual line of evidence may be subject to a variety of interpretations, the strength of the combined data is absolutely compelling.

The overwhelming weight of evidence points to the conclusion that Needle and Syringe Programs are an essential public health measure. By reducing needle-sharing, Needle and Syringe Programs have been found to be very effective in reducing the spread of blood borne infections such as HIV/AIDS and hepatitis C, both in Australia and overseas. Public policy should be properly 'evidence-based' and the Needle and Syringe Program can certainly claim that it is.

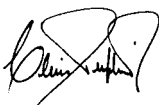
Needle & Syringe Programs are also extremely cost effective: by preventing these infections, health care costs can be contained. Far from encouraging drug use, Needle and Syringe Programs provide a useful referral point for drug rehabilitation and education. The scientific evidence shows that Needle and Syringe Programs have not led to an increase in the number of discarded needles and form a useful disposal strategy.

In view of the compelling nature of this research, ANCAHRD has developed the enclosed Information Kit on Needle and Syringe Programs and I am arranging for the Kit to be distributed to Federal, State and Territory Parliamentarians, Local Government Officers, Environmental Health Officers, Health Department Officers and service providers working in the field.

The Information Kit consists of two documents. *A Review of the Evidence* provides the scientific evidence for Needle and Syringe Programs in a question and answer format. It addresses the crucial questions that people who are unsure about the value of Needle and Syringe Programs want answered. *Your Questions Answered* provides a summary of the scientific evidence in a quick-reference format to assist in answering these inquiries. It also includes contact details for further information.

Australia's enviable record in controlling the spread of HIV/AIDS and hepatitis C has rested on the bi-partisan, partnership approach to public health policy in this field. I commend the decision of the Council of Australian Governments in April 1999 to approve a \$221m package which included support measures for Needle and Syringe Programs. The main aims of these measures are to increase the number of clients accessing education and treatment services and to increase the availability of Needle and Syringe Programs, including through pharmacies.

I commend this Information Kit to you and thank you for your interest in Needle and Syringe Programs.



Chris Puplick
Chair

Australian National Council on AIDS, Hepatitis C and Related Diseases
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Summary

This Review summarises the literature on the provision of sterile injecting equipment to people who inject drugs and other related issues. The proportion of the Australian population thought to inject drugs is about one percent or approximately 275,000 people¹. The first case of HIV infection in a drug injector without other risk factors in Australia was detected in 1985. In the following year, a Needle and Syringe Program started in Australia. At that time, hepatitis C infection was already well established among drug injectors with more than half being infected².

Staff at Needle and Syringe Programs provide much more than injecting equipment. They are often the first point of contact with health services for people who inject drugs, facilitating the entry of many drug users into drug treatment. Some Programs also provide primary medical care to this disadvantaged section of Australians whose health is usually very poor.

Needle and Syringe Programs have reduced the transmission of HIV, hepatitis B and hepatitis C. The size of the reduction of HIV transmission due to Needle and Syringe Programs has been calculated to be at least 30 percent. Australia's Needle and Syringe Programs were estimated to have prevented almost 3,000 cases of HIV infection in 1991 alone, a saving of \$266 million. HIV epidemics have occurred recently in some cities in North America where Needle and Syringe Programs existed. Arbitrary restrictions on the number of needles and syringes provided from the Programs are thought to have been a critical weakness in their effectiveness in preventing transmission of blood borne viral infections.

Research has shown that Needle and Syringe Programs do not increase injecting drug use or the number of discarded needles and syringes. Even though Needle and Syringe Programs enjoy a high level of support from the public in Australia and abroad, they also attract some criticism. Objections to Needle and Syringe Programs include: concern about specific locations, the inconsistency in providing some free injecting equipment to drug

injectors but not to people with diabetes, concern that the Programs are responsible for all discarded injecting equipment in a local area and that the Programs condone drug use.

Some members of the public are concerned that they may receive a needlestick injury from a discarded needle and syringe and then become infected with HIV or hepatitis. No cases of HIV, hepatitis B or hepatitis C infection resulting from a needlestick injury due to discarded injection equipment have been identified although researchers have investigated the outcomes of such injuries.

There is abundant evidence from Australia and other countries of the public health benefits of Needle and Syringe Programs. The US Secretary for Health and Human Services, Donna Shalala, has announced that⁹⁰:

"This nation is fighting two deadly epidemics - AIDS and drug abuse. They are robbing us of far too many of our citizens and weakening our future. A meticulous scientific review has now proven that needle exchange programs can reduce the transmission of HIV and save lives without losing ground in the battle against illegal drugs. It offers communities that decide to pursue needle exchange programs yet another weapon in the fight against AIDS (20 April 1998)"

Countries that have implemented these Programs have averted HIV epidemics among injecting drug users, while countries that have not implemented these measures have often experienced uncontrolled epidemics. There is strong evidence that if HIV becomes endemic among injecting drug users, HIV can then spread to their sexual partners and children resulting in high mortality rates and large social and economic costs to the entire population.

How many people inject drugs in Australia?

Because drug injection is an illegal and highly stigmatised activity, it is difficult to estimate how many Australians inject drugs. According to the National Drug Strategy Household Survey, one to two percent of the Australian population have injected drugs at some time in their lives¹. Another estimate places the number of regular and occasional injecting drug users in Australia at 100,000 and 175,000, respectively². The number of dependent heroin users in Australia in 1993 was estimated to be about 59,000³. There are also a large number of non-dependent heroin injectors and persons who inject other drugs, such as amphetamines and cocaine.

What is Australia's Drug Strategy?

Australia's first national drug strategy, the National Campaign Against Drug Abuse, was developed in 1985. When the National Drug Strategy (1993-1997) was evaluated, Single and Rohl⁴ found that the harm minimisation approach, which had been introduced in the initial strategy, was fundamental to the ongoing success of the strategy.

Harm minimisation refers to policies and programs aimed at reducing drug-related harm and encompasses a wide range of integrated approaches including supply-reduction (law enforcement), demand-reduction (including abstinence-orientated interventions) and harm-reduction (including Needle and Syringe Programs)⁵. Harm minimisation aims to improve health, social and economic outcomes for both the community and individuals. Governments do not condone illegal behaviours such as injecting drug use, but they do acknowledge that these behaviours occur. Consequently, authorities have a responsibility to develop and implement public health and law enforcement measures that contribute to reducing the harm that such behaviours can cause, both to individuals and the community.

While the practice of injecting drug use continues, provision of sterile injecting equipment through Needle and Syringe Programs is an important harm reduction strategy to reduce the spread of blood borne viruses such as HIV and hepatitis C⁵.

Australia's National Drug Strategy is widely recognised as one of the most progressive and respected drug strategies in the world. Australia's current national drug strategy, "Building Partnerships", is based on four main features⁵:

- the principle of harm minimisation, which includes supply reduction, demand reduction and harm reduction
- a comprehensive approach, which includes all drugs and other substances
- a partnership between Commonwealth, State and Territory governments, health, law enforcement and education agencies, community based organisations and industry in tackling drug related harm
- an emphasis on rigorous research, evidence-based practice and evaluation and assessment of interventions.

A major component of the next phase of the National Drug Strategy is the Prime Minister's National Illicit Drug Strategy '*Tough on Drugs*'. The Strategy has been allocated \$516 million over four years and aims to combat illicit drug use through a sharper focus on reducing the supply of drugs and on reducing demand. It encompasses a balanced package of measures aimed at law enforcement, education, treatment and research.

In April 1999 the Council of Australian Governments approved a \$221 million package of measures also under the National Illicit Drug Strategy. Within this package two health promotion initiatives will be implemented by the National Centre for Disease Control: *Increased Education, Counselling and Referral Services Provided Through Community Based Programs* and *Diversification of Existing Needle and Syringe Programs*. These two initiatives will enhance the capacity of State and Territory Needle and Syringe Programs to provide effective and accessible education, counselling and referral services. The aims of these initiatives are to increase the number of clients accessing education and treatment services and to increase the availability of sterile needles and syringes, including through pharmacies. The initiatives will be supported by the development of nationally consistent training packages for service providers.

What are Australia's strategies on HIV/AIDS and hepatitis C?

The first National HIV/AIDS Strategy was launched in 1989. According to Professor Richard Feachem, from the World Bank, who oversaw the evaluation of the second National HIV/AIDS Strategy:

The first National HIV/AIDS Strategy released by the Commonwealth Government in 1989 provided a framework for an integrated response to the HIV epidemic and a plan for action across a range of policy and program activities. Needle and Syringe Programs were a key component of the education and prevention strategy⁶.

Professor Feachem concluded: 'Needle and Syringe Exchange Programs must be a foundation of Australia's prevention efforts in a third Strategy and beyond'. The third National HIV/AIDS Strategy (Partnerships in Practice: National HIV/AIDS Strategy 1996-97 to 1998-99) continues to support Needle and Syringe Programs as an important part of its prevention program for people who inject drugs.

Australia's HIV/AIDS Strategy has received international recognition. According to the Joint United Nations Programme on HIV/AIDS Best Practice Collection:

[In Australia], early and vigorous HIV prevention programmes aimed at injecting drug users resulted in stable and low rates of HIV prevalence among drug users and related population groups. It is generally agreed that this prompt - and sustained - action fundamentally altered the course of the country's epidemic⁷.

The fourth National HIV/AIDS Strategy and the first National Hepatitis C Strategy, both currently being developed, will continue to support Needle and Syringe Programs as effective harm minimisation interventions.

What are Needle and Syringe Programs?

Needle and Syringe Programs are a public health measure to reduce the spread of blood borne viral infections such as HIV and hepatitis C among injecting drug users. These Programs are supported by the National Drug Strategy's harm minimisation framework. They provide a range of services that include provision of injecting equipment, education and information on reduction of drug use, referral to drug treatment, medical care and legal and social services. Equipment provided includes needles and syringes, swabs, vials of sterile water and 'sharps bins' for the safe disposal of used injection equipment. The aim of providing sterile injecting equipment is to prevent the shared use of injecting equipment, which can lead to the transmission of blood borne viral infections. Staff also address the potential for transmission of infection via sexual contact by providing condoms and safe sex education. By engaging drug users into health services, those who continue to use drugs are likely to cause less harm to themselves and society. They are also an important point for collection of used injecting equipment.

The first Australian Needle and Syringe Program began in Sydney in 1986 as a trial project⁸. The testing of syringes returned to this Darlinghurst Program detected an increase in HIV prevalence, suggesting that HIV was spreading among clients^{8,9}. In the following year Needle and Syringe Programs became NSW Government policy. Other States and Territories followed soon after. There are now over 3,000 Needle and Syringe Programs in Australia. In 1996/97, total spending by States and Territories on Needle and Syringe Programs was almost \$13 million¹⁰.

There are several different types of Needle and Syringe Programs operating in Australia. *Primary outlets* are stand-alone agencies that are specifically established to provide injecting equipment, usually along with primary medical care. Staff provide these specific services in a non-judgmental manner and develop a rapport with individuals who are otherwise hard to reach. *Secondary outlets* offer needle distribution or exchange as one of a range of other health or community services. Typical secondary outlets include hospital Accident and Emergency Departments and Community Health Centres. *Mobile services* are distribution and exchange services provided by vehicle.

Outreach services have workers who move around from place to place to extend the reach of the service. *Vending machines* dispense "Fitpacks" containing several 1ml syringes for a small fee. These machines are monitored and restocked by Needle and Syringe Program staff. Fitpacks are hard plastic containers which enable used syringes to be "locked-in" for disposal so that they cannot be removed for re-use or cause injury.

Needle and Syringe Programs tend to be located in relatively public places because they need to be accessible.

The Pharmacy Fitpack Scheme operating in over 500 pharmacies throughout Australia provides 1ml syringes, which can either be purchased, or, in NSW, exchanged free on return of a pack with used syringes. In addition to those participating in the Fitpack Scheme, other pharmacies sell needles and syringes and other equipment used for injecting. Injecting drug users paid over \$600,000 for needles and syringes in NSW in 1996/97.

The NSW Department of Health's *Needle and Syringe Exchange Policy and Procedures Manual*¹¹ describes the rationale behind Needle and Syringe Programs:

- despite drug education and treatment programs, many people will continue to inject licit and illicit drugs for varying periods of time;
- people must be provided with the knowledge and skills necessary to make informed decisions about high risk behaviours.

In Victoria, there are approximately 200 agencies registered to operate a Needle and Syringe Program and about half of these are in rural areas. Over 700 pharmacies sell needles and syringes.

Over 40 countries operate Needle and Syringe Programs including: Austria, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, India, Kazakhstan, Latvia, Luxembourg, Nepal, Netherlands, Norway, Philippines, Poland, Portugal, Slovak Republic, Salvador, Slovenia, Thailand, Ukraine, United Kingdom and the United States of America¹².

Do Needle and Syringe Programs prevent HIV, hepatitis B and hepatitis C?

The effectiveness of Australia's Needle and Syringe Programs can be measured against its success in controlling the spread of blood borne viruses such as HIV and hepatitis C. In terms of per capita AIDS incidence, Australia was ranked fifth among developed countries in 1985. The success of the strategies led to Australia being ranked at seventh by 1993. HIV prevalence (the percentage of people infected at any point in time) among injecting drug users in Australia has remained below three percent and HIV incidence (the percentage of new people infected each year), below one percent¹³⁻¹⁵.

By comparison, in the US, HIV infection is the leading cause of death among people aged between 25 and 44 years. Among the estimated 1-1.5 million injecting drug users in the US, approximately 19,000 HIV infections occur annually¹⁶. The Centres for Disease Control and Prevention in the US estimate almost half the 41,000 new HIV infections in the US each year occur among injecting drug users and their sexual partners and children¹⁷.

Professor Penny and Dr Wodak, leading Australian HIV experts, commented that:

The risk of HIV in injecting drug users is not limited to themselves but to their sexual partners and, tragically, to their children. In New York City, which has a population about the same size as NSW but rampant HIV among IDUs [injecting drug users], more than 17,000 pediatric cases of AIDS have been reported, compared to 42 in NSW. These pediatric cases in New York City were in almost all cases the direct result of one or other parent being an IDU. There is a serious risk to Australian children of HIV infection acquired from their parents should an uncontrolled epidemic erupt among IDUs, if present programs are curtailed. (Sydney Morning Herald, 19 August 1997, page 15)

In sharp contrast to HIV infection, the prevalence and incidence of hepatitis C is high among injecting drug users in Australia. Hepatitis C prevalence among injecting drug users is about 65% and incidence is about 15%. Hepatitis C has been more difficult to contain because the virus is more infectious than HIV. Evidence also exists for significant rates of hepatitis C infection among injecting drug users in Australia as early as 1971- the epidemic was therefore well established prior to the virus being identified in 1989. A disease is more difficult to control

once it has already become established. An injecting drug user sharing an uncleaned needle used by another injecting drug user of unknown infection status is at between 150 and 800 times higher risk of infection with hepatitis C than HIV. High rates of hepatitis C transmission have been found among injecting drug users who share injecting equipment¹³.

There are approximately 11,000 new hepatitis C infections annually, of which about 90% are thought to be from injecting drug use. Approximately 190,000 Australians have been infected with hepatitis C, of whom about 134,000 remain chronically infected and are therefore at risk of cirrhosis¹⁸. For each 1,000 new infections with hepatitis C, over \$14 million (in 1994 terms) is added to Australia's health care costs¹⁹.

Without Needle and Syringe Programs the rates of hepatitis C infection are likely to have been far higher. There is some indication that the incidence of hepatitis C has fallen in some Australian injecting drug user populations, from 18% prior to 1987 to about 12% since then²⁰.

A recent article recommended the following strategy in order to bring hepatitis C under control¹³:

control of the hepatitis C epidemic requires more intense concentration on reducing needle-sharing and other risky behaviour, and will require a greater effort to decrease incidence than HIV has. This has been seen with HIV infection among injecting drug users in other countries - epidemics which have reached high prevalence have proven much harder to control than epidemics which have not taken off before intervention began. Further decreases in needle-sharing will require increased support for accepted programs as well as consideration of new strategies.

Almost all studies of risk behaviour of people attending Needle and Syringe Programs have found a decrease or at least no increase in risky practices²¹⁻²⁶. Some Needle and Syringe Programs are deliberately located in areas of high drug use, where people who inject drugs tend to be more disadvantaged than other groups of injecting drug users who purchase injecting equipment from pharmacies. Studies of these Programs find extremely high levels of risk behaviour among clients. One study reported no change in risky practices in people attending a Needle and

Syringe Program. Hahn²⁷ found that among 341 injecting drug users in drug treatment in San Francisco between 1989 and 1990, the number of partners with whom equipment was shared declined equally among those injecting drug users who had never used Needle and Syringe Programs as well as those who had. A review of all Australian studies on injecting drug use up to 1994 found dramatic decreases in syringe sharing from almost 100% in 1986 to about 15% in 1994²⁶.

In Windham, Connecticut, a Needle and Syringe Program closed in March 1997, after several years of operation and following ten months of heated community debate. Injecting drug users from Windham were interviewed before, and three months after, the closure of the Program²⁸. After the program closed, 51% of injecting drug users were forced to obtain their syringes from unsafe sources, such as family, friends or street dealers, compared to 14% when the program was operating. Further, the number of injections per syringe increased from 3.5 to 7.7 injections after the Program closed. The proportion of injecting drug users who reported sharing injecting equipment in the preceding month rose from 16% to 34%. There was no decrease in the number of needles and syringes discarded in public places and no effect on the visibility of the Windham illicit drug scene after the closure of the Needle and Syringe Program.

Two recent studies confirmed the beneficial effects of Needle and Syringe Programs in reducing transmission of HIV. Des Jarlais²⁹ examined data on more than 7,300 injecting drug users from five cities around the world that had stable and consistent levels of HIV infection between 1984 and 1993. Compared to those cities with high levels of infection, such as New York City, the cities with consistently low levels of HIV, such as Sydney, had made concerted efforts to ensure sterile injecting equipment was widely available. Hurley³⁰ reviewed research findings on the effectiveness of Needle and Syringe Programs in 81 cities between 1984 and 1994. Among drug injectors, HIV prevalence decreased 5.8% per year in 29 cities with Needle and Syringe Programs and increased 5.9% in 52 cities without such Programs.

Compelling evidence for the effectiveness of Needle and Syringe Programs in reducing the spread of HIV comes from a rigorous study in New Haven, USA. A unique syringe-tracking and testing system was used to evaluate the program³¹⁻³³.

The biological evidence in this study is important because, unlike other sorts of evidence, it does not rely on injecting drug users' awareness of their own HIV status. Each client and each syringe were assigned a unique identification code. The time and place where needles were distributed and returned, client codes and syringe codes were recorded for every transaction. Systematic samples of returned needles were tested for HIV. This system allowed sophisticated mathematical modelling which showed that HIV incidence among clients was reduced by more than 30% as a result of this Program.

Injecting drug users who had ever used the Needle and Syringe Program in Tacoma, USA, were 5.5 times less likely to have hepatitis B and 7.3 times less likely to have hepatitis C than their non-attending peers³⁴. A later study failed to find a protective effect of the Program on hepatitis B and hepatitis C incidence³⁵. However, the sample size may have been too small to detect any benefit. In the US, access to sterile injecting equipment is restricted by long-standing syringe prescription and paraphernalia laws (prohibiting the possession of injecting equipment) and by a Congressional ban, in place since 1988, on the use of federal funds to operate Needle and Syringe Programs. Despite the lack of federal funding, 117 Needle and Syringe Programs were operating in 1998 in the US, exchanging nearly 14 million needles and syringes each year. As there are an estimated 1.3 billion injections each year in the US³⁶, the effectiveness of US Needle and Syringe Programs is severely limited by their inadequate coverage.

How do we know the data are reliable?

Much of the data collected about Needle and Syringe Programs consist of self-reports of illegal and socially stigmatised activities. This inevitably raises concerns about the accuracy of these data. Numerous investigations have demonstrated that self-reported data are accurate and can be used for studies of illicit drug users. A review of the literature³⁷ found that self-reported data of illicit drug users were reliable (likely to be confirmed on repeat testing) and valid (likely to be confirmed by interviews with significant others). The data are accurate provided strong

assurances of confidentiality and anonymity have been provided - as was the case in the studies of the impact of Needle and Syringe Programs on various outcomes^{38, 39}. Some studies specifically assessed the accuracy of self-reported risk behaviours of injecting drug users and found them to be reliable⁴⁰ and not significantly affected by attempts to provide socially desirable responses⁴¹.

Are Needle and Syringe Programs cost-effective?

Estimates of the cost-effectiveness of Needle and Syringe Programs in Australia in 1991 were made using the base case (the most plausible), best case and worst case assumptions⁴². Needle and Syringe Programs were estimated to have prevented between 300 (worst case), 2900 (base case) and over 10,000 (best case) infections of HIV in 1991. In the same year, \$10 million was spent on Needle and Syringe Programs nationally which produced savings of \$266 million. The savings in treatment costs resulting from the prevention of HIV more than offset the operating costs of the Programs. Further, the analysis actually underestimated the likely cost-effectiveness of Needle and Syringe Programs because it did not include savings from prevention of the transmission of hepatitis B and hepatitis C. Had these additional benefits been measured, both the number of years of life saved and the net direct cost savings would have been substantially increased. Based on conservative assumptions, Lurie and Drucker¹⁷ estimated that if the US had adopted Needle and Syringe Programs in 1987 as Australia did and continued their expansion until 1995 at the same rate as Australia, then between 4,400 and 10,000 HIV infections would have been prevented. This action would have saved the US health care system between US\$240 and US\$540 million.

Five US Government-funded reviews concluded that Needle and Syringe Programs were both effective and cost-effective in the prevention of HIV without increasing illicit drug use⁴³⁻⁴⁷. These conclusions were confirmed at the 1997 US National Institutes of Health Consensus Development Conference.

Do Needle and Syringe Programs lead injecting drug users into treatment?

Injecting drug users come from all walks of life. However, some reports suggest that Needle and Syringe Programs tend to attract injecting drug users who are homeless, inject more frequently^{27, 48}, use shooting galleries⁴⁸ or engage in sex work^{48, 49}. Many of these clients have never been in contact with other drug services^{24, 50, 51}. Therefore, Needle and Syringe Programs can be important points of contact for high-risk injecting drug users by providing harm reduction educational materials and referral to drug treatment, medical, legal and social services. Studies in London⁵² and New Haven, USA^{53, 54} found that Needle and Syringe Programs acted as "gateways" to more traditional medical treatment for drug dependence for substantial proportions of clients. Over two years, almost 600 drug users attending a Needle and Syringe Program in New Haven, USA, requested treatment for drug problems. Over a 16 month period, 38% of clients attending a London Program were referred to drug services and other medical services.

Do Needle and Syringe Programs increase drug use?

Fluctuations in drug use patterns are common⁵⁵. Initiation into drug use, including injecting, is influenced by a complex interplay of a wide range of social, psychological, cultural and historical factors⁵⁶⁻⁶¹. Watters and colleagues²⁵ evaluated a Needle and Syringe Program in San Francisco using bi-annual interviews with 5,644 injecting drug users recruited from detoxification programs and the "street" between 1986 and 1992. They found that there was a progressive decline in the proportion of injecting drug users who reported first injecting drugs in the preceding year, from 3% in 1989 to 1% in 1992. If Needle and Syringe Programs encouraged new recruits into injecting, the proportion of new recruits would be increasing rather than decreasing. A similar

decline in initiation to injecting was also reported by Gwydish⁶². The median age of initiation of injecting among injecting drug users attending over 20 Needle and Syringe Programs around Australia has remained stable at 18 years between 1995 and 1997⁶³.

In November 1986, a trial Needle and Syringe Program was established in Sydney adjacent to a methadone maintenance unit. The increased availability of needles and syringes was not associated with an increase in the presence of illicit injectable drugs in the urine specimens of clients of the methadone program compared to a control methadone unit where there was no known change in needle and syringe availability⁶⁴. Among injecting drug users attending Needle and Syringe Programs, decreases in the number and frequency of injections have been reported by several studies⁶⁵⁻⁶⁷.

One recent study reported a negative impact of Needle and Syringe Programs on drug use. Schoenbaum⁶⁸ found that between 1989 and 1993 among 329 methadone clients in New York City, there was a 61% relative decline in the proportion of non-Needle and Syringe Program users continuing to inject, compared with a 14% decline in those who had ever used the Needle and Syringe Program. It is possible, however, that these results simply represent self-selection: injecting drug users who expected to continue to inject may have been more likely to attend Needle and Syringe Programs.

Do Needle and Syringe Programs lead to crime?

Very little evidence exists as to whether Needle and Syringe Programs lead to crime. Researchers in America found that a Baltimore needle-exchange program neither contributed to crime nor to the number of discarded needles in the street. Researchers examined arrest patterns in areas with Needle and Syringe Programs and areas without such Programs and found no difference⁶⁹.

Do Needle and Syringe Programs result in discarded needles and syringes?

There is no evidence that Needle and Syringe Programs increase the number of needles and syringes discarded in public areas. Oliver⁷⁰ reported on the number of discarded syringes in the immediate vicinity of a Needle and Syringe Program for 3.5 months before it opened and for 20 months after. Prior to the start of the Program, 5.1 syringes were found per month. After the program started the average number of syringes found per month declined to 1.9. Doherty⁷¹ conducted a survey of a random sample of 32 city blocks in areas with high levels of drug use in Baltimore, Maryland, before and after the implementation of a Needle and Syringe Program. Analyses showed no significant increase in the number of discarded needles during the first two months of the Needle and Syringe Program's operation.

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In Tasmania, authorities report that approximately 99% of needles and syringes are disposed of in a responsible manner. In 1997/98, there were approximately 2,800 syringes distributed in Tasmania for every single report received of used discarded equipment (Department of Community and Health Services, personal communication). The NSW Department of Health reported that in the 1996-1997 financial year, 50% of all needles and syringes distributed under the program were returned to needle and syringe outlets. All Area Health Services in NSW collect self-reported data from Needle and Syringe Program clients regarding their methods of disposal of injecting equipment. These figures indicate that between 90% and 95% of all clients disposed of needles and syringes in a safe way. During a twenty-month period in Brisbane, 1.4 million pieces of injecting equipment were distributed and only 871 pieces were found to have been inappropriately discarded. This represents less than 0.1% of injecting equipment being discarded⁷².

There was no change in the number of needlestick injuries to members of the general public in the years before and after Needle and Syringe Programs were introduced in Amsterdam^{73, 74}.

For injecting drug users, criminal penalties can be a substantial deterrent to participation in programs aimed at safe disposal of used equipment⁷⁵. In Connecticut the number of needlestick injuries reported by police fell after laws preventing legal access to injecting equipment were repealed⁷⁶

What is the chance of getting HIV, hepatitis B or hepatitis C from being pricked by a used needle?

There are two types of needlestick injuries. Occupational needlestick injuries occur to health care workers and other staff in the course of their work. Accidental needlestick injuries occur when a member of the public is pricked by a needle that has been improperly discarded. The risk of HIV transmission from a single occupational needlestick injury for health workers, where the source-patient is known to be HIV positive has been estimated to be 0.3% per exposure (or 1 in 316)^{77, 78}. The risks are higher for transmission of hepatitis C (3% - 10%) and hepatitis B (19-30%).

The probability of becoming infected with a blood borne virus following an injury is even lower for members of the general population for a variety of reasons. The needle often has to pierce clothes or shoes before penetrating the skin. The syringe may have been exposed to the elements for some time. HIV is a fragile virus once outside the living body especially when exposed to unfavourable external environmental conditions⁷⁹. In addition, the syringe is likely to contain a far smaller volume of blood than syringes encountered in a health care setting⁸⁰. No cases have been published of a member of the general public becoming infected with HIV, hepatitis B or hepatitis C as a result of a needlestick injury from discarded injection equipment (Queensland Health, personal communication, 1999.) A review of emergency room records in Rome identified 408 people who had suffered needlestick injuries from discarded syringes. All wounds were superficial; in 40% of the injuries, the needle had passed through a shoe or clothing. None of the 408 patients developed HIV following the needlestick injury⁸¹. In Madrid, 249 children who suffered a needlestick injury from discarded needles and syringes between May 1988 and April 1995 were tested for HIV. No infections were detected⁸².

What can be learnt from overseas experience with Needle and Syringe Programs?

Despite Needle and Syringe Programs, HIV infection among injecting drug users has still spread in some cities around the world, including Montreal and Vancouver (which has the largest Needle and Syringe Program in North America).

Schechter⁴⁸ documented the association between frequent Needle and Syringe Program attendance and higher HIV prevalence among injecting drug users in Vancouver. This finding was interpreted subsequently as evidence that Needle and Syringe Programs exacerbate the spread of HIV and therefore should be discontinued. However, Schechter found a number of confounding factors which were likely to have accounted for the association between frequent use of the Needle and Syringe Programs and higher levels of HIV infection. Frequent Needle and Syringe Program attendees were younger and significantly more likely to report unstable housing, frequent injecting, frequent cocaine injecting, involvement in the sex trade, injecting in shooting galleries and incarceration within the preceding six months. They were significantly less likely to report enrolment in methadone maintenance. These risk factors among attenders were more likely to account for the observed association between frequent Needle and Syringe Program attendance and HIV infection than the hypothesis that Needle and Syringe Programs contribute to the formation of new needle sharing networks⁸³. No evidence of such networks could be found.

The Canadian experience suggests that although Needle and Syringe Programs are crucial, they are only one component of a comprehensive blood borne viral infection prevention program which should include counselling, support, education and drug treatment such as methadone maintenance programs¹⁶. In Vancouver, although Needle and Syringe Programs were introduced relatively early, the number of needles exchanged was grossly inadequate to ensure single-use of sterile injecting

equipment¹⁶. Furthermore, access to treatment, methadone maintenance and counselling was inadequate. Education of injecting drug users, increased availability of sterile injecting equipment, ready access to effective drug treatment acceptable to the target population, and organised involvement of injecting drug users in response to this epidemic are all necessary for effective control⁸⁴.

A cohort of people who inject drugs has been studied in Montreal, where a Needle and Syringe Program has operated since 1988. One report from this study suggested that attenders were more than twice as likely to become infected with HIV as non-attenders⁴⁹. In explaining these results, the authors pointed out that the Montreal Needle and Syringe Program had a strict one-for-one exchange policy (that is, used needles and syringes had to be returned in order to obtain sterile replacements), with a maximum of 15 syringes exchanged per person per night. Since attenders engaged in higher risk behaviours, including more frequent injecting than non-attenders, the authors concluded that the number of needles and syringes distributed was likely to have been substantially less than was actually needed.

The Vancouver study¹⁶ has also attracted the attention of opponents of Needle and Syringe Programs despite the fact that it does not clearly demonstrate either adverse or beneficial effects of Needle and Syringe Programs. According to Drucker and colleagues⁸⁵.

That study demonstrated that a significant HIV epidemic occurred despite the presence of an NSEP (this does not mean that the NSEP was ineffective, only that it was not perfectly effective) and, like the Montreal study, that the highest-risk IDU [injecting drug user] attend the NSEP [Needle and Syringe Exchange Program]. The number of incident HIV infections was only 24 and almost all used the NSEP, so it was impossible to say whether NSEP users were more likely to contract HIV infection than those not using the program or whether the epidemic would have occurred sooner or been larger had there not been an NSEP.

It is critical to recall that, by the authors' own descriptions, neither study was designed to evaluate NSEP. But both the Montreal and the Vancouver studies suggest that NSEP, because they attract high-risk IDU, would be excellent places to implement behavioural risk-reduction programs. It is significant that public-health officials in both Montreal and Vancouver, rather than curtailing these programs, have responded to these findings by expanding the availability of NSEP services in their cities⁸⁵.

What is the level of support for Needle and Syringe Programs?

In Perth, 87% of a sample of 400 members of the general public agreed that injecting drug users "should be legally able to obtain new needles from authorised sources" while 93% felt that the provision of new needles was important to stop the spread of HIV⁸⁶. In NSW, 90% of a sample of 300 urban and rural members of the general community supported the continuation of the State's Needle and Syringe Programs and 96% agreed that Needle and Syringe Programs play an important part in stopping the spread of AIDS in Australia⁸⁷. In five suburbs around the Kings Cross area in Sydney, 305 residents were randomly selected for a telephone survey of whom 82% agreed that Needle and Syringe Programs should continue⁸⁸.

A 1997 US national telephone survey found that 71% of respondents supported the lifting of a ban on federal funding for Needle and Syringe Programs. This includes majorities of supporters in both political parties⁸⁹. In 1996, 70% of the Swiss population rejected a proposal in a national referendum to discontinue Needle and Syringe Programs (Sydney Morning Herald, 30th September, 1997, page 8). In Australia, the Inaugural Metropolitan Mayors Statement on Drugs recognised the 'importance of needle exchange as part of the National HIV/AIDS Strategy and [undertook] to encourage appropriate agencies and pharmacies to provide syringes' (24 November, 1998).

The US Secretary for Health and Human Services, Donna Shalala, has announced that ⁹⁰:

this nation is fighting two deadly epidemics - AIDS and drug abuse. They are robbing us of far too many of our citizens and weakening our future. A meticulous scientific review has now proven that needle exchange programs can reduce the transmission of HIV and save lives without losing ground in the battle against illegal drugs. It offers communities that decide to pursue needle exchange programs yet another weapon in their fight against AIDS (20 April 1998).

Dr Harold Varmus, Director of the US National Institutes of Health noted that ⁹⁰:

an exhaustive review of the science in this area indicates that needle exchange programs can be an effective component of the global effort to end the epidemic of HIV disease.... recent findings have strengthened the scientific evidence that needle exchange programs do not encourage the use of illegal drugs.

Conclusion

Needle and Syringe Programs are a critical component of strategies to control the spread of HIV, hepatitis C and other blood borne viral infections among injecting drug users and ultimately the broader community. Evidence of the effectiveness of Needle and Syringe Programs is consistent and compelling. They have been found to be highly cost effective compared to the cost of treating HIV and hepatitis C infection. Needle and Syringe Programs have not been associated with increases in drug injecting or discarded used injecting equipment. These Programs enable referral to drug treatment and other health services. In communities where Needle and Syringe Programs have been established, they generally receive community support.

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