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through research that generates new evidence and  
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## *Syringe coverage and Australian NSPs*

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### **Key messages:**

- Australia's needle and syringe program (NSP) is a valuable, cost effective harm reduction service; NSPs have contributed to an overall HIV prevalence rate of less than 1% amongst people who inject drugs (PWID), and reduced rates of syringe sharing from 70-90% to around 17%.
- However, NSPs have not dramatically reduced the prevalence of hepatitis C (HCV), which remains steady at around 50-70% of PWID.
- Several contextual reasons are likely to contribute towards the prevalence of HCV, including inadequate syringe coverage. Syringe coverage can be calculated as the ratio of the number of sterile needles available to an individual to the frequency of their injecting; 100% coverage means that PWID have one sterile needle/syringe (N/S) for each episode of injecting.
- It has been estimated that twenty per cent of Australian PWID have inadequate coverage (less than 100%).
- The per-exposure probability of HCV transmission from using a contaminated syringe is 2.5-5%, and improving the level of syringe coverage could help reduce the prevalence of HCV by 50% (up to 80% when combined with opioid substitution therapy). If syringe sharing were to drop from 15% to 10%, an estimated 33% reduction in HCV incidence would result.
- Syringe coverage could be improved by increasing the quantity and quality of NSP services. Suggestions include improving the distribution of syringe vending machines, increasing the range of injecting equipment available at NSPs, easing restrictions on the number of N/S available per visit, implementing youth and cultural training for staff, and encouraging NSP partnerships with healthcare services offering HCV testing and treatment.

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## What is the issue?

In Australia, we are fortunate to have had a large-scale needle and syringe program (NSP) across the country since the late 1980s. NSPs operate through dedicated services (primary) or as part of other health-related services (secondary); needles and syringes (N/S) are provided free of charge from around 800 NSP locations, or for purchase at around 3000 pharmacies and 120 syringe vending machines across Australia (Iversen, Topp, Wand, & Maher, 2012). These services aim to prevent the spread of blood borne viruses (BBVs) and link people who inject drugs (PWID) to health and related services, as outlined in *The National Needle and Syringe Program National Strategic Framework 2010-2014* (Australian Government Department of Health, 2010a) and the *Third National Hepatitis C Strategy 2010-2013* (Australian Government Department of Health, 2010b).

Australia was an early adopter of what was a controversial harm reduction response to the burgeoning HIV epidemic. This early adoption is believed to have significantly mitigated this epidemic amongst PWID, to the extent that only 30-40 cases of HIV per year are transmitted via injecting drug use (IDU) (Kwon, Iversen, Maher, Law, & Wilson, 2009), with the remainder mostly among men who have sex with men. This has resulted in an overall HIV prevalence rate amongst Australian PWID of less than 1% (Kwon et al., 2012).

Conversely, NSPs in Australia have not been quite so successful in addressing the epidemic of hepatitis C virus (HCV) amongst PWID, perhaps in part due to the disease having been prevalent amongst PWID for much longer than HIV, having emerged in the 1970s (Australian Government Department of Health, 2008). HCV prevalence has remained fairly steady at around 50-70% of PWID since the introduction of NSPs in Australia (Kwon et al., 2012), although incidence of HCV appears to be declining among PWID (Australian Government Department of Health, 2008). The stable prevalence of HCV is evident despite considerable scale-up of the program since its introduction and the availability of other harm reduction interventions (e.g. opioid substitution therapy (OST)) which also have the capacity to address risk behaviours associated with injecting, and thus impact on population prevalence of BBVs (Iversen et al., 2012). Kwon et al. (2009) note that the per exposure probability of disease transmission from using a contaminated syringe is 0.1-0.5% for HIV and 2.5-5% for HCV, which provides context for the higher prevalence of HCV amongst PWID, as the risk of transmission is much greater.

Despite what appears to be a failure of NSPs to reduce HCV prevalence, mathematical modelling studies have demonstrated that, without NSPs, prevalence of both HIV and HCV would be higher amongst PWID (1.2-1.5% for HIV and 66-80% for HCV) (Kwon et al., 2012). These averted infections have saved the healthcare system up to \$220 million in the period 2000-2010 and up to \$950 million in future costs (Kwon et al., 2012). Nevertheless, HCV incidence and prevalence amongst PWID needs to be more effectively addressed to improve health outcomes in the long term and work towards eradicating the disease.

## Syringe Coverage in Australia

'Syringe coverage' indicates the degree to which PWID have access to an acceptable number of sterile N/S, and is a critical indicator of the effectiveness of NSPs and other interventions to prevent or control BBV transmission among PWID (Iversen et al., 2012). Syringe coverage is calculated as a ratio between the number of syringes distributed to an individual, minus the number that they sell or give away, and the number of injecting episodes that the individual engages in within a defined time period (Bluthenthal et al., 2007). This ratio gives an indication of individual level coverage; 100% coverage means that PWID have one sterile N/S for each episode of injecting. Given that some PWID may have difficulty with injecting and may require more than one N/S per episode in order to successfully inject, coverage greater than 100% may be deemed desirable.

Internationally, population-level coverage has been defined as meaning that at least 60% of the PWID population is in contact with an NSP during a reporting period (Abdul-Quader et al., 2013; WHO, UNODC, & UNAIDS, 2012). This is described as equating to 'high' coverage and a target for services to aim to reach (WHO et al., 2012). Des Jarlais (2013) suggests that 20-30 N/S per PWID per year may be the minimum coverage level required for population-level changes in disease prevalence. Others describe 'low' coverage as being less than 100 N/S per PWID per year, 'medium' coverage being 100-200 N/S per PWID per year, and the internationally recommended target is 200 N/S per PWID per year (Petersen, Myers, van Hout, Plüddemann, & Parry, 2013; WHO et al., 2012).

Using 2007/2008 data from NSPs across Australia, an estimated 203 N/S were distributed to each PWID per year on average (National Centre in HIV Epidemiology and Clinical Research, 2009). Although consistent with international targets, this

figure masks potential problems in individual-level coverage. Available estimates suggest twenty per cent of Australian PWID have insufficient new syringes for all injections (Iversen et al., 2012). PWID who know their positive HCV status and PWID who procure N/S from NSPs are likely to have syringe coverage greater than 100% (Iversen et al., 2012); the latter are also more likely to have high coverage than those who procure N/S from pharmacies (Bryant, Paquette, & Wilson, 2012). However, the most recent National Drug Strategy Household Survey revealed that only 41% of those had injected drugs in 2013 usually obtained their N/S from NSPs (Australian Institute of Health and Welfare, 2014). Meanwhile, since the 1990s, rates of receptive syringe sharing (i.e., using a N/S after someone else) have decreased from around 31% but now remain stable at around 17% (Kwon et al., 2012). It is believed that sharing rates were around 70-90% prior to the introduction of NSPs in Australia (Kwon et al., 2012).

The above figures may be indicative that current syringe coverage is adequate to ameliorate risk behaviours to some degree but not to impact on population prevalence of HCV, as not all PWID have equitable access to the means to reduce HCV transmission. Lower syringe coverage is associated with increased reporting of risk behaviours and higher rates of BBV transmission (Bluthenthal et al., 2007; Vickerman, Martin, Turner, & Hickman, 2012), therefore greater than 100% coverage across the entire PWID population is an appropriate service target.

Further modelling studies have explored whether changes to the coverage of NSP services could ultimately lower the future prevalence of HCV amongst PWID. Kwon et al. (2009) noted that if syringe sharing were to drop from 15% to 10%, a 33% reduction in HCV incidence would result. High coverage NSPs (greater than 100%) have the potential to reduce HCV incidence by 50%, but when combined with the provision of OST, could reduce it by as much as 80% (Vickerman et al., 2012). However, there may be a threshold for syringe coverage at which changes in injecting risk behaviours no longer occur (for example, Bryant et al. (2012) found that 60% coverage was sufficient to diminish the relationship between syringe availability and sharing behaviour), but disease prevalence could potentially be impacted. A number of contextual reasons for injecting risk behaviours (e.g. receptive syringe sharing) may not be addressed through increasing syringe coverage (Bryant et al., 2012), including behaviours that occur in close relationships between PWID, such as routine sharing between sexual partners or family members.

## ***Current barriers to adequate syringe coverage***

The now expired National NSP Strategic Framework 2010-2014 (Australian Government Department of Health, 2010a) outlined a number of barriers to adequate syringe coverage through its establishment of national targets for improvement. The Framework identifies both the need to expand the hours and number of sites for NSPs but also that services must be accessible to a range of key population target groups for NSPs to be successful as a public health strategy.

The Framework lists barriers to service availability and accessibility which include:

- Lack of geographic access in both regional and urban areas, along with poor access to affordable transport options
- Cost barriers in accessing NSPs (e.g. pharmacies and vending machines)
- Lack of anonymity when accessing services, particularly in smaller, rural communities
- NSPs not providing all types of injecting equipment
- Limits on amounts of equipment distributed by particular services
- No prison NSPs currently operating in any Australian jurisdiction

These barriers have recently been reaffirmed by the ANCD (2013) in their position paper on NSPs. In addition, the fact that these barriers remain an issue despite the implementation of a national framework and numerous other related national public health strategies indicates that much work still needs to occur to increase syringe coverage sufficiently to impact disease prevalence. Further, even where access to NSPs may be high, individual level factors such as homelessness and mental illness can impact on syringe coverage as the ability of individuals to store sufficient quantities of syringes or carry them on their person may be limited.

## ***What steps can be taken to improve syringe coverage?***

Considering the association between high syringe coverage and procurement of syringes from NSPs, increasing the quantity of NSP services and expanding opening hours could poten-

tially improve access for geographically isolated PWID, particularly in areas that are currently underserved (Iversen et al., 2012; Kwon et al., 2009; Vickerman et al., 2012). Furthermore, implementing more syringe vending machines in both urban and rural areas could also address the issue, and would have the added benefits of not only providing a more anonymous source but a source that is accessible at any time, though may involve a cost to the service user.

Some structural changes need to be made to NSPs in order to optimise their impact. Both primary and secondary services should readily provide information on harm reduction when required, including informal conversation and written material. Ideally, NSPs should have close relationships with appropriate healthcare services, particularly those providing OST and BBV testing and treatment. Currently, secondary NSPs receive no direct funding to staff services, rather they are run through existing services as an unfunded 'add-on' to core services. In order to expect secondary NSPs to provide the same level of service quality and accessibility, consideration should be given to adequately resourcing these services (Law Reform Drugs and Crime Prevention Committee, 2014).

Easing restrictions on the number of N/S available per visit, types of equipment available and allowing secondary exchange amongst peers (which is currently illegal) could improve access; Bluthenthal et al. (2007) found that less restrictive distribution policies at NSPs were associated with higher levels of adequate coverage in California, and recommended NSPs provide syringes in the least restrictive way possible.

Implementing training for working with young people and people from culturally and linguistically diverse backgrounds and encouraging professional development for all NSP staff could help make NSPs more welcoming for these populations (Australian Council on Drugs, 2013).

The introduction of prison-based NSPs in all Australian jurisdictions should be prioritised as a matter of urgency, given what is known about the risk for HCV transmission in prison (Dolan et al., 2010) and the fact that prison NSPs have been prioritised in national BBV strategies for many years with no action by state or territory governments.

A combination of harm reduction strategies with improved quantity and quality of NSPs has the potential to reduce HCV prevalence among Australian PWID. Most of these measures would be low-cost; Kwon et al. (2009) estimated that a 10%

increase in syringe distribution could theoretically be achieved with just a 2% increase in the total NSP budget. However, while gains with regards to HCV incidence could occur early with a scale-up of services, impacts on prevalence require sustained investment over a number of years and may remain modest (Vickerman et al., 2012). For example, in countries with already good coverage such as Australia, high coverage NSPs may need to reach 80% of the PWID population for 20 years before identifiable impacts occur. Scaling up NSPs is unlikely to address structural and individual barriers to service access, such as homelessness and mental health issues. Even so, discussions surrounding the next National NSP Strategic Framework need to consider the benefits of improving coverage, through a coordinated national strategy that encourages all Australian jurisdictions to engage in best practice.

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