

LOW DEAD SPACE SYRINGES

**ANALYSIS AND BENEFITS FOR
PEOPLE WHO INJECT DRUGS**



**Low Dead Space Syringes: analysis and benefits
for People who Inject Drugs**

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Harm Reduction International (HRI) is an international NGO which works to use data and advocacy to promote harm reduction and drug policy reform. We demonstrate how rights-based, evidence-informed responses to drugs contribute to healthier, safer societies, and why investing in harm reduction makes sense.

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INTRODUCTION

Harm reduction services for people who inject drugs are essential interventions. They offer non-judgmental services to a criminalised and stigmatised community and are key public health measures to prevent and control infectious diseases such as HIV and hepatitis C virus (HCV). Injecting drug use is documented in 190 of 207 countries and territories and it is estimated that globally there are 14.8 million people (aged 15-64 years) who inject drugs.^[1] The World Health Organization (WHO) and other international organisations have recommended access to comprehensive harm reduction services to prevent the spread of blood borne diseases for more than a decade.^[2,3]

Despite this, harm reduction services are under-resourced and not implemented at scale. Although systematic literature reviews found that high coverage NSP can be effective in reducing HIV and HCV infection risks;^[4-6] only five countries around the globe are providing high coverage of both needle and syringe programmes (NSPs) and opioid agonist treatment (OAT).^[7]

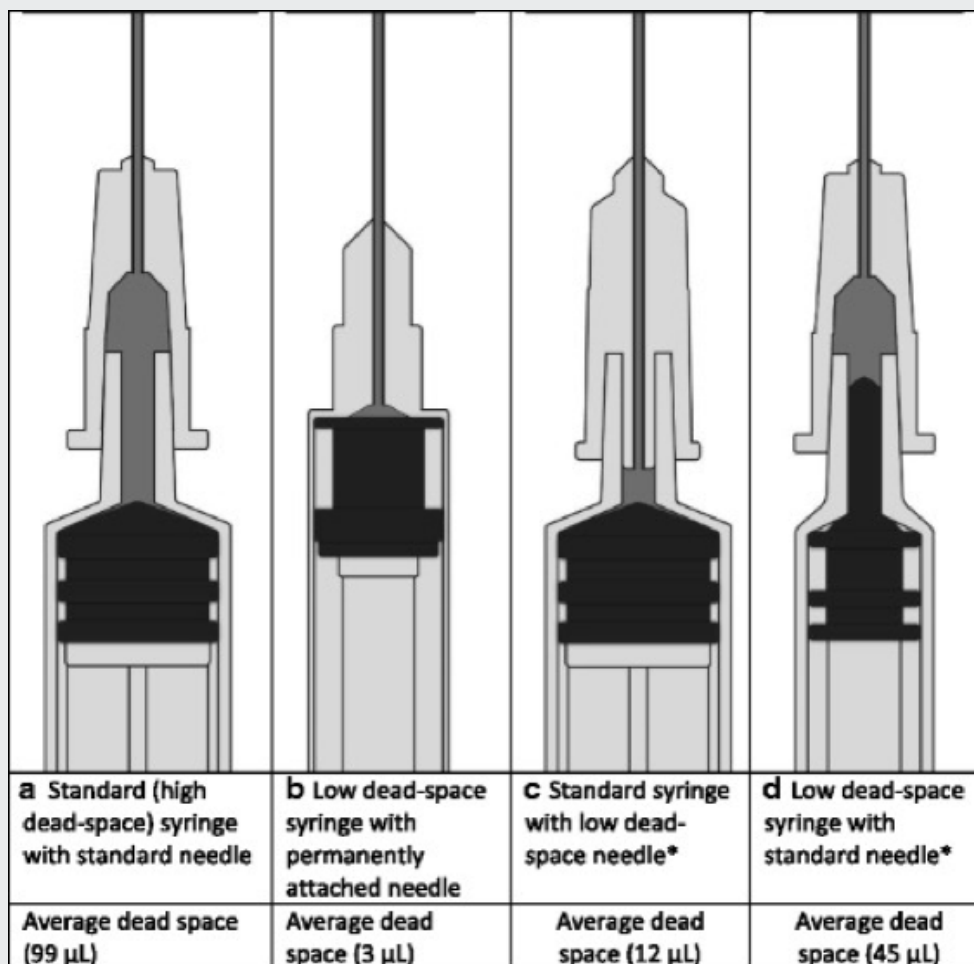
There are many tools for HIV and HCV prevention amongst people who use drugs, though access, availability, and acceptability remains a challenge in many countries. Low dead space syringes and needles (LDSS) is one such tool. Direct sharing of needles and syringes account for most HIV and HCV infections among people who inject drugs in many countries. A recent modelling study estimated that removing the transmission risk due to injecting drug use could prevent 43% of all new HCV infections globally.^[8-12] As a result, the design of needles and syringes distributed in harm reduction programmes should be a consideration in efforts to reduce infections.

All needle and syringe combinations have dead space (see box on syringe dead space), because some void area remains even when the plunger of the syringe is fully depressed. When people who inject drugs share their injecting equipment, the volume of dead space is an important determinant of the volume of blood that is transferred from one person to another.^[9,13] The less residual fluid that remains in a syringe and needle combination, the less blood is transferred if or when the equipment is shared. Studies on syringe dead space suggest that regular syringes with detachable needles can contain ten times more dead space compared to syringes with fixed needles.^[14,15]

Dead space in syringes have been discussed in the harm reduction context since the 1990s,^[13,16] and many researchers and activists have argued that the potential benefits of LDSS compared to high dead space syringes and needles (HDSS) are sufficient to support an overall switch to LDSS at NSPs. It is hypothesised that LDSS can reduce HIV and HCV transmission risk, as experiments showed that the volume of the residual fluid (blood) in the syringe following injection, is a key factor in the survival of these viruses in syringes; both HIV and HCV can survive longer in higher volumes of blood.^[17–19] Epidemiological studies found HDSS use to be associated with higher HIV prevalence rates,^[20–23] while exclusive LDSS use was associated with reduced HCV incidence,^[24] though more evidence is still needed in this regard.^[17,25]

Modelling shows that LDSS use could result in a decrease both for HIV and HCV prevalence.^[14,25] Furthermore, the results of a recent threshold analyses indicated that compared to HDSS, detachable LDSS would only need to reduce the risk of virus transmission by 0.26% to be cost saving and 0.04% to be cost-effective in a high income setting.^[25] Although sufficient coverage of NSP should be prioritised at all times, there is an argument to be made that switching people who inject drugs from HDSS to LDSS should be included in comprehensive blood borne virus prevention programmes, as it could increase the effectiveness of NSPs even when coverage is inadequate.^[15] Reflecting the mounting evidence in the literature, the inclusion of LDSS at NSPs has been included in WHO guidelines and recommendations on HIV and HCV prevention since 2012.^[3,11,26,27] Recent updates of similar guidelines, for example, the UK's National Institute for Health and Care Excellence (NICE) NSP guidelines, and the European Centre for Disease Prevention and Control (ECDC) and the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) joint guidance on the prevention of infectious diseases among people who inject drugs added explicit references to LDSS as equipment that should be offered at NSPs, together with information on its benefits.^[28,29]

SYRINGE DEAD SPACE



Dead space is the total area of a syringe and the needle where any fluid can remain with the plunger fully depressed. When people who inject drugs share needles and syringes, the volume of dead space determines the volume of blood that can be transferred from one person to another. Different types of needles and syringes have different volumes of dead space. The size of the dead space depends on several characteristics like the gauge and length of the needle, the design and the volume of the syringe and the form of the end of the plunger. In general, out of the typically available syringes at an NSP, the one-piece 1ml insulin type syringes with fine gauge fixed needles have the smallest dead space, and the two-piece, larger volume syringes with detachable large diameter needles have the largest dead space.

This picture is from:

Zule WA, Pande PG, Otiashvili D, Bobashev GV, Friedman SR, Gyarmathy VA, et al. Options for reducing HIV transmission related to the dead space in needles and syringes. Harm Reduction Journal 2018;15(1):3. <https://harmreductionjournal.biomedcentral.com/articles/10.1186/s12954-017-0207-5/figures/1>

However, different types of syringes and needles are needed for injecting, and large volume syringes with detachable needles are often central in drug injecting practices. For example, larger needle sizes and lengths are needed to access deeper femoral veins or intramuscular injection.^[15,17,19] Furthermore, injecting homemade drug mixtures, viscous liquids or pharmaceuticals and large volume drug solutions in general require larger volume syringes.^[15,22,30] Detachable needles can have practical benefits too, they can be replaced if they become blunt or clogged without losing the drugs already in the syringe.^[15,17,31,32] Additionally, the use of HDSS can reflect culturally mediated behaviours, for example, peer initiation and early experiences of injecting can influence injecting practices and equipment choice, and equipment can become an important part of injecting rituals.^[17,30] People who inject drugs can be reluctant to switch their usual injecting equipment because routines can help to inject successfully or overcome difficulties like finding a vein or injecting while in withdrawal.^[17,30]

It is important to highlight that using HDSS and needles is often not merely about matters of individual choice but can also reflect structural determinants.^[30] There are many factors that inform injecting practices; the type of syringes used to inject can depend on price (LDSS could be more expensive), availability (the NSP might offer only one type of syringe), or can be influenced by the available substances in the local drug market. A good example is a case study from Lithuania where 1ml insulin type LDSS syringes with fixed needle were used to inject drugs sold in powder form, while high volume syringes with detachable needles were used to inject a cheap opiate sold in liquid form because it required injecting larger volumes of liquid and floating particles that would clog the finer gauge fixed needles found on insulin-type syringes.^[22]

Facilitating the transition to LDSS requires a thorough understanding of the local practices of people who inject drugs, and requires the involvement of the community of people who use drugs.^[15,17,30,33] There is not a one-size-fits-all solution. Different types of needles and syringes should be available in low dead space options, because higher volume syringes and larger gauge and different length needles will continue to be required by people who use drugs. A study on the acceptability of LDSS among people who inject drugs concluded that the perceived benefits of a reduction in wasted drug and a lower risk of transferring blood borne viruses were key aspects that could facilitate the transition to LDSS use. The study also indicated that peer initiation and on-going information sharing (by peers and NSP staff) is important in shaping equipment choices.^[17]

METHODOLOGY

To map syringe types at NSPs around the globe, a survey was developed with thematic sections focusing on syringe and needle distribution, and number of clients visiting NSPs - with detailed questions on the type of syringes and needles that are available at the programme (including brand name, volume of the syringe, needle gauge). Estimates on syringe access outside of harm reduction services (for example at pharmacies) were requested. Additionally, the questionnaire included open ended questions on procurement of needles and syringes and service providers' experiences about syringe preferences among their clients. A literature review on LDSS was also conducted. Survey data collection was complemented by expert interviews with key stakeholders from Australia, Greece, Kyrgyzstan, Nigeria, Puerto Rico, Scotland, and Tanzania. The interviews were supplemented with data collection, which provided a clear understanding of NSP delivery structures, focusing on funding, syringe procurement and client preferences.

To ensure geographic and income diversity (mix of low-, middle-, and high-income countries), countries included in the survey were selected with random sampling based on the countries where needle and syringe programmes are available according to the [Global State of Harm Reduction 2022](#) report. The number of people who inject drugs in a country, along with HIV and HCV prevalence among people who inject drugs, was considered; all countries included in UNITAID's hepatitis C project (Armenia, Egypt, Georgia, India, Kyrgyzstan, Nigeria, South Africa, Tanzania, Ukraine, Vietnam) were included.ⁱ

NSP service providers were mapped in the selected countries and invited to complete the survey questionnaire. Where country level data collection exists on NSP provision (either collected by government or organisations responsible for NSP implementation), data access was requested. In the case of Australia and Switzerland (where country level data on NSPs is collected), representatives

i In total, 46 countries were selected: Albania, Algeria, Armenia, Australia, Bangladesh, Belarus, Cambodia, Canada, Colombia, Czechia, Democratic Republic of the Congo, Denmark, Egypt, France, Georgia, Greece, Hungary, India, Indonesia, Iran, Kenya, Kyrgyzstan, Latvia, Malaysia, Mauritius, Morocco, Mozambique, Myanmar, Nigeria, North Macedonia, Pakistan, Puerto Rico, Romania, Russia, Senegal, Serbia, South Africa, Switzerland, Tanzania, Thailand, Tunisia, Uganda, UK – Scotland, UK – Wales, Ukraine, Vietnam. For the complete list of countries where the data collection has concluded please see Table 1, Table 2 or Table 3.

in every canton/state/territory were approached and asked to provide data or expert estimates on the proportion of LDSS among the distributed needles and syringes.

The survey questionnaire was aimed at service providers. It requested data on the type of needles and syringes provided and the numbers of needles and syringes distributed, as well as their insights on client preferences regarding syringe types. A Russian translation of the questionnaire was used in Russia and Kyrgyzstan. The survey was translated into Spanish for Colombian respondents.

RESULTS

FUNDING AND SYRINGE PROCUREMENT FOR NEEDLE AND SYRINGE PROGRAMMES (NSP)

Funding for NSPs comes from both international and national resources. International funding is the primary, and often the only, source of funding for harm reduction in the low- and middle-income countries in our sample. Programmes that are domestically funded are found in high income countries. International funding is almost exclusively provided by the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund). In Nigeria, South Africa and Thailand, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) was among the major donors. The Alliance for Public Health (an organisation responsible for harm reduction initiatives in Ukraine) was funded by other donorsⁱⁱ as well as the Global Fund.^[34–36]

ii U.S. Centers for Disease Control and Prevention (CDC), U.S. Agency for International Development (USAID), The Elton John AIDS Foundation (EJAF), National Institute on Drug Abuse (NIDA, USA), Yale University, Foundation for Innovative New Diagnostics (FIND), United Nations (UNOPS).

Table 1: Main source of funding for NSPs in the participating countries

International Donors	Domestic Funding (National government, civil society)
Albania	Australia
Armenia	Czechia
Cambodia	Greece
Colombia	Hungary
Georgia	Mauritius
Kyrgyzstan	North Macedonia
Nigeria	Puerto Rico
Kenya	Switzerland
Pakistan	UK - Scotland
Russia - Moscow	
South Africa	
Tanzania	
Thailand	
Ukraine	
Vietnam	

Syringe procurement is somewhat centralised in most countries. In countries where the Global Fund is the main source of funding, the Principal Recipient purchases all harm reduction equipment and distributes it to the organisations implementing harm reduction programmes. This process can lead to different results in terms of the type of available syringes. For example, in Kyrgyzstan, all syringes are purchased centrally but only HDSS are purchased because they are cheaper than LDSS.^[37] As a result, LDSS are not available in the country's NSPs, but a diverse set of syringes from 1ml to 10ml are available.^[37] In South Africa, the Principal Recipient only purchases 1ml insulin type syringes with fixed needles, the most common LDSS. So in South Africa there is only one type of syringe available but all syringes are LDSS.^[35,37] In Armenia, NSPs are funded by the Global Fund through a local institution (National Centre for Infectious Diseases) purchasing harm reduction equipment, and there is a set limit on the available number of syringes for NSP clients per year (200). However, this does not cover the needs of local people who inject drugs, and NSPs are unable to provide an adequate number of syringes and needles.^[38] Another issue with international funding for NSPs is sustainability when domestic funding is not guaranteed; for example, in Albania, the Global Fund will end its support for harm reduction in 2024, putting service providers in a precarious situation.^[39]

In countries where national or local governments fund harm reduction services, NSPs can obtain their equipment according to public procurement policies. A typical, more centralised mode of procurement is when one or more medical equipment supplier is chosen by the government, service providers order the equipment they need, and the government matches the expenses. This is the case, for example, in some states/territories in Australia and Scotland.^[40,41] An example of a more decentralized version is Switzerland, where in some cantons, service providers are able to purchase the equipment they need autonomously. The canton pays for their orders trusting the service providers to choose the best value for money.^[42] In other countries, public procurement policies can hinder access to the best equipment available. In North Macedonia (where LDSS are not available at NSPs), service providers can only order their equipment through a public procurement system and must choose the cheapest option even if it is not the best quality equipment.^[43]

Outside of harm reduction services, in some countries people who inject drugs can access injecting equipment in pharmacies. However, in the majority of countries surveyed, NSPs are the main source of injecting equipment for people who inject drugs. In 16 out of the 22 countries where estimates on pharmacy access were available, data indicates more than 80% of injecting equipment is obtained in NSPs. An important exception is Scotland, where pharmacies are

an integral part of the harm reduction response, and only 23% of all distributed needles and syringes were distributed at NSPs.^[44] In Scotland, for example, the majority (77%) of injecting equipment provision outlets were pharmacy-run, and pharmacy outlets offer the same type of syringes as traditional NSPs (non-pharmacy-based injecting equipment provision outlet).^[44] In general, pharmacy access can be hindered by stigma and discrimination as pharmacies in many countries often refuse to sell syringes or needles when they suspect drug use.^[45,46] Notably, people have to pay for needles and syringes at pharmacies, this is a significant financial barrier to access as NSPs typically distribute injecting equipment for free or for a symbolic amount of money. However, pharmacies can play a role when NSP coverage is inadequate or geographical distribution of NSPs is uneven. For example, in Georgia, NSPs are implemented in only 11 cities, and people who inject drugs buy injecting equipment in pharmacies where NSPs are not available.^[47] Similarly, in Mauritius, people who inject drugs use pharmacies because harm reduction services have difficulties reaching every part of the island due to the limited number of harm reduction workers.^[48] Furthermore, NSPs in Mauritius do not receive enough needles and syringes from the government, thus some clients have to buy injecting equipment at pharmacies too.^[48]

Table 2: Estimated proportion of pharmacy and needle exchange access

Country Name	Pharmacy		NSP	
	Estimates Range (%)	Estimates Average (%)	Estimates Range (%)	Estimates Average (%)
Albania	0	0	100	100
Armenia	0	0	100	100
Australia ⁱⁱⁱ	-	11	-	89
Cambodia	10-12	11	88-90	89
Colombia	20-40	30	60-80	70
Czechia	1-15	10	85-99	90
Georgia	60	60	40	40
Greece	nd	nd	nd	nd
Hungary	nd	nd	nd	nd
Kenya	0-10	2	70-100	90
Kyrgyzstan	0-70	28	30-100	72
Mauritius	60	60	40	40
Myanmar	nd	nd	nd	nd
Nigeria	0-70	20	30-100	80
North Macedonia	10-30	18	70-90	82
Pakistan	0	0	100	100
Puerto Rico	0-10	3	80-100	94
Russia - Moscow	90	90	10	10
South Africa	0	0	95	95
Switzerland ^{iv}	-	1,4	-	98
Tanzania	0-4	1	93-100	98
Thailand	0	0	100	100
Uganda	0	0	100	100
UK - Scotland ^v	-	77	-	23
Ukraine	nd	nd	nd	nd
Vietnam	20	20	80	80

iii Based on national data collection report (Needle Syringe Program National Minimum Data Collection), Table 4.1: National syringe distribution and per capita syringes distributed, 2012/13-2021/22. See: https://www.kirby.unsw.edu.au/sites/default/files/documents/NSP-NMDC-2022_National-Data-Report.pdf

iv Based on national data collection report (Monitoring der Abgabe von sterilem Konsummaterial an Drogenkonsumierende in der Schweiz 2021), Table 1: Anzahl und Art des abgegebenen Konsummaterials nach Art des Angebots. See: https://www.infodrog.ch/files/content/schadensminderung_de/2022-05-18_infodrog_Monitoring-Konsummaterial_2021_v02.pdf

v Based on national data collection report (Injecting Equipment Provision in Scotland - 2022/23), Figure 1.1: Number and percentage of injecting equipment provision outlets by financial year and outlet type. See: <https://www.publichealthscotland.scot/media/22055/2023-09-19-iep-report.pdf>

AVAILABLE TYPES OF SYRINGES AND CLIENT PREFERENCES

NSPs should provide access to a wide range of injecting equipment to cover the needs of people who inject drugs. In the mapping of service providers, the focus was on three categories: traditional HDSS with detachable needles, insulin type LDSS syringes with fixed needles, and new style LDSS with detachable needles. Survey results indicate that HDSS are the most common syringe type available in all countries surveyed, with the exceptions of Colombia, Puerto Rico, and South Africa. In South Africa, NSPs distribute centrally purchased syringes and only 1ml insulin type syringes with fixed needles are procured.^[35] In Colombia and Puerto Rico the choice to provide only insulin type syringes is based on client preferences, though insulin type syringes with different length of fixed needles are available.^[49,50] Traditional HDSS with detachable needles are available in many varieties, with 2ml, 3ml, 5ml and 10ml syringes being the most common in the participating countries; NSPs typically offer two or more varieties. Needles that can be attached to syringes are also available in many varieties, though NSPs often purchase three-part sets where the needle is pre-packaged together with the syringe.

The most common LDSS are 1ml insulin type syringes with fixed needles, which are available at NSPs in most countries. However, this type is most commonly available in two varieties, 1ml and 0.5 barrels, which are not large enough volumes for many people who inject drugs. LDSS versions of larger volume syringes with detachable needles have become available, and both Scotland and Ukraine have introduced them in harm reduction services. Currently, low dead space versions of larger volume syringes and detachable needles are only available in NSPs in Scotland.^[40] In Ukraine, larger volume LDSS were introduced as a pilot project in 2016, but NSPs stopped distributing them in 2021 as they were unpopular among the clients.^[51]

According to survey respondents, larger volume syringes are preferred by people who inject opioid agonist medications, performance and image enhancing drugs (PIEDs) or prescription drugs like benzodiazepines, because these substances must be dissolved and smaller volume syringes are not suitable for these purposes. In general, when people inject substances in a larger volume of solution, the most accessible LDSS syringes, 1ml insulin type syringes are not the most suitable option. When the quality of the available substances on the drug market is low, using detachable needles can be a practical solution because clogged needles can be replaced if necessary. In Nigeria, developed tolerance was also mentioned as a factor behind preferring larger volume

syringes, furthermore people who use pharmaceutical opioids tend to prefer larger volume syringes because they can inject the content of an ampoule with one injection instead of three.^[52]

Another central determinant of preferred syringe and needle types is the place of injection. People who inject deeper in femoral veins or muscles need longer and thicker needles, while people injecting in veins in hands and arms tend to prefer thinner, shorter needles. Age can be another determining factor in preferred needle type, as people who have been injecting for a long time can have damaged veins and might be able to inject successfully to one specific place or with a specific type of syringe and needle combination. The condition of veins was a central determinant in injecting equipment preferences for people in many countries. For example, in Albania, insulin type syringes with thin needles are used mainly by people who started injecting recently because their veins are still in good condition. In Czechia, service providers linked longer history of injecting drug use to a preference for longer needles as they need to access deeper veins.^[39,53] The data from survey respondents does not reveal that gender plays a major role in syringe preferences. Women are stigmatised more than men for using drugs, creating serious barriers in their access to harm reduction services.^[54] That can lead to significant data gap in gender differences. Further, targeted research would be needed to explore women's syringe preferences.

The quality of the equipment is also an important factor in client preferences; for example, in North Macedonia, a respondent mentioned that their clients do not consider the dead space of a syringe but rather the sharpness of the needle, and prefer a specific brand that is perceived to be sharper than others.^[43] Similarly, in Pakistan, a specific brand's 3ml and 5ml syringes are preferred because of their high quality, and those are only available in HDSS versions.^[55] In Czechia, quality was mentioned as one of the main determinants of clients' syringe preferences beside familiarity and ease of use.^[56]

Stigma and discrimination of people who inject drugs also plays a role in syringe preferences, some choose thinner needles because they leave smaller marks (which are easier to hide) or inject to femoral veins instead of more visible places. For example, in Thailand, men who have sex with men prefer thinner (29G or 31G) needles, because they do not want others to spot their injection marks and find out that they are using drugs.^[36] In Greece, it was reported that some younger 20-22 year old clients inject in the groin to avoid visible injecting marks on their arms.^[57]

Habits, learned behaviour and initiation of injecting were mentioned among the factors that can influence the preferred type of syringes. In Czechia, syringe preferences were attributed mainly to familiarity and perceived quality of the syringe; according to service providers, people who inject drugs tend to choose what they are used to, and are reluctant to switch to unfamiliar injecting equipment.^[53,56,58] In Ukraine, between 2016 and 2021, 6.8 million low dead space detachable needles (two types, 25G 16 mm and 25G 25 mm) were distributed, but were unpopular among the clients of the NSPs, which resulted in the number of distributed LDSS decreasing through the years. In 2021, the organisation responsible for distributing injecting equipment in the country decided to discontinue the distribution of LDSS (the remaining 1.5 million needles were collected and donated to hospitals).^[51] Considering these social aspects is important in order to achieve uptake. A service providers' decision to change the type of syringes available is not enough to effectively introduce new style LDSS syringes and convince people who inject drugs to switch to new types of injecting equipment.

According to the data, most countries with a high proportion of LDSS among the distributed syringes and needles are higher income countries from the Global North. However, a high proportion of LDSS do not necessarily indicate that harm reduction services are appropriate. For example, in South Africa though all syringes are LDSS, only one type of syringe is available but the main concern is coverage; similarly, in Hungary 99% syringes are LDSS but the coverage of NSPs is low (only six syringes distributed per person who inject drugs per year).^[35,59,60] In contrast, in Australia, which offer a wide array of syringes and needles including HDSS, has high coverage of NSPs with 636 syringes per person who inject drugs per year, distributing more syringes than the estimated number of injections in the country (in 2021/22, 116% of all injections by people who regularly inject drugs were covered by a sterile syringe).^[61]

EXAMPLES OF SYRINGES AVAILABLE AT NSPs



Table 4: Low dead space syringe availability in 2022 – summary table

Country name	Service providers participated	Total no. of NSP clients	Total no. of distributed needles/syringes	Proportion of LDSS	Syringe types available at NSPs		
					Fixed LDSS (insulin style)	New style detach. LDSS	Traditional detach. HDSS
South Africa	100%	20,160	4,515,792	100	Y	N	N
Puerto Rico	75-99%	10,876	293,546	100	Y	N	N
Colombia	100%	600	16,232	100	Y	N	N
Hungary ^{vi}	100%	1,114	39,925	99	Y	N	Y
UK - Scotland ^{vii}	100%	nd	2,351,849	98	Y	Y	Y
Czechia	50-74%	7,350	2,202,356	81	Y	N	Y
Australia ^{viii}	75-99%	nd	41,968,549	80 ^{ix}	Y	N	Y
Georgia	100%	40,300	3,900,000	76	Y	N	Y
Greece	75-99%	7,666	710,055	59	Y	N	Y
Russia - Moscow	100%	2,321	323,658	25	Y	N	Y
Thailand	100%	19,801	899,160	20	Y	N	Y
Albania	100%	2,410	188,988	18	Y	N	Y
Armenia	100%	5,578	1,075,240	15	Y	N	Y
Kenya	75-99%	11,989	909,986	13	Y	N	Y
Nigeria	50-74%	23,814	317,898	8	Y	N	Y
Myanmar	50-74%	28,400	18,076,247	7	Y	N	Y
Mauritius	50-74%	6,823	431,370	4	Y	N	Y
Cambodia	100%	1,856	1,348,058	0	N	N	Y
North Macedonia	50-74%	1,343	270,737	0	N	N	Y
Kyrgyzstan	100%	16,444	2,222,984	0	N	N	Y
Pakistan	100%	44,342	8,601,310	0	N	N	Y
Switzerland ^x	50-74%	nd	1,489,897	0	N	N	Y
Tanzania	75-99%	722	422,187	0	N	N	Y
Ukraine	100%	nd	12,758,105	0	N	N	Y
Uganda	75-99%	409	78,512	0	N	N	Y
Vietnam	100%	83,000	14,500,000	0	N	N	Y

vi Year 2021, most recent data available

vii Most recent data used, it refers to year 2022/23, as data is collected by financial year. Number of individuals attending NSPs is not available because “Anonymous identifiers are used for recording IEP attendances rather than an identifier linked to an individual”, the number of attendances was 132,447 for 2022/23.^[44] Proportion of HDS was based on Needle Exchange Surveillance Initiative report 2019/20.^[40,62]

viii Year 2021, most recent data available. Number of distributed syringes are from country level data collection. The data collection doesn’t record syringe types, every state and territory were invited to send an estimate on the proportion of LDSS vs HDSS. In Australia, the NSP NMDC report data collection doesn’t collect data on individual clients but on occasion of service (OOS) defined as “contact between NSP staff and a NSP client in order to transact sterile injecting equipment, advice or other related service from a NSP”, the estimated OOS for 2022 was 530,000.^[61]

ix Estimate, based on data from 5 states and territories (New South Wales, Northern Territory, Queensland, Tasmania, Victoria). The 5 states and territories covered 82% of the total distributed syringes in Australia in public outlets (34,5 million out of the 41,9 million syringes/needles).

x Number of clients and number of distributed syringes are from country level data collection. The data collection doesn’t record syringe types, every canton was invited to send an estimate on the proportion of LDSS vs HDSS, 3 cantons provided data covering the majority of distributed syringes. According to the respondents, no LDSS are available at NSPs in their cantons. All syringes distributed are traditional syringes with detachable needles (insulin type syringes are not available at NSPs).

CONCLUSION

NSPs in low- and middle-income countries are currently less likely to distribute LDSS to people who inject drugs, while NSPs in high income countries are more likely to distribute a diverse range of needles and syringes including LDSS. The proportion of LDSS among the distributed syringes is 25% or less in most of the participating countries (17 out of 26 countries) and LDSS are not available at NSPs in nine countries. Traditional HDSS syringes with detachable needles were the most common type of syringes, they were available in all countries except three (Colombia, Puerto Rico and South Africa). New LDSS versions of large barrels and detachable needles were available only in Scotland. Central procurement systems are central in determining the type of syringes available at NSPs, and sometimes budgetary limitations influence decisions on harm reduction equipment procurement more than long-term public health goals.

All procurement and equipment decisions should be made with people who use drugs and harm reduction professionals. Generally, preferences on needle and syringe types are based on practical considerations like the volume of the solution or the site of injection, though habits and past experiences are also important. The latter is especially important when new equipment is introduced. Concerns in the community should be addressed before new style detachable LDSS are introduced, and the availability of new LDSS should be accompanied by dissemination of information on advantages of the approach (for example, reduced transmission of communicable diseases, less waste of drugs).

Although the issue of increased risk of transmission due to residual fluid in HDSS emerged decades ago, routine data collections generally do not include information on the type of syringes distributed in harm reduction programmes. It would be strategic to incorporate syringe types as part of data collection, not only because it has the potential to impact the public health outcomes of NSPs, but because the quality and the variety of equipment is important for people who use drugs. In many countries around the world, people who inject drugs can obtain injecting equipment only from harm reduction programmes. As the main source of sterile injecting equipment, it is important to offer good quality needles and syringes in appropriate variety covering the needs of the local community.

The availability of LDSS and needles is only one measure in a complex array of harm reduction services that should be available for every person who injects

drugs.^[63] LDSS should be considered one part of a comprehensive harm reduction intervention, implemented to reach underserved populations like people living in remote, rural areas, women who use drugs, Indigenous, ethnic minority and other subpopulations of people who inject drugs in the intersections of multiple vulnerabilities.^[63] Although reaching high coverage of harm reduction interventions should be prioritised, it is strategic to also increase the impact of existing programmes. LDSS provision can be an important addition to implement NSP, opioid agonist therapy and naloxone distribution with appropriate coverage of services and unrestricted provision of injecting equipment.

The available evidence suggests that LDSS could be a cost-effective tool to decrease HIV and HCV prevalence among people who inject drugs, thus introducing LDSS or increasing their distribution at NSPs could be a way to improve already established services. However, consulting the local community is vital to ensuring that provided equipment is suitable, and accompanied with messages that are appropriate to support the uptake of LDSS.

UNITAID HCV PORTFOLIO

Unitaid launched a new portfolio investment focused on the prevention of hepatitis C among key populations in low- and middle-income countries in 2023. Under this portfolio, three consortia, led by Frontline Aids, Médecins du Monde and PATH, have been funded to undertake research and implementation projects on hepatitis C. These harm reduction projects specifically target people who use drugs and aim to close the HCV prevention and testing gap, through increased access to new and/or underused tools for prevention and enhanced simplified HCV testing and treatment care models in 10 countries.

Low dead space syringes and needles are part of the new and/or underused tools implemented under this portfolio. This study will generate evidence on best practice approaches for implementing LDSS distribution programmes that enhance acceptability and sustain high levels of LDSS uptake. It will also estimate the potential public health impact and cost-effectiveness of such interventions within harm reduction services.

This HCV portfolio gathers implementing and research organizations as well as community representatives, including the International Network of People who Use Drugs (INPUD), who has developed a methodology for exploring community values and preferences for LDSS. INPUD also chairs, with Coact as vice-chair, the Community Advisory Board (CAB) set up to contribute to this work.

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