

MONOGRAPH 1/2011

Pharmacy Needle and Syringe Survey, New South Wales 2009

Findings from metropolitan and regional pharmacies

Joanne Bryant
Hannah Wilson
Carla Treloar

MONOGRAPH 1/2011

Pharmacy Needle and Syringe Survey, New South Wales 2009

Findings from metropolitan and regional pharmacies

Joanne Bryant
Hannah Wilson
Carla Treloar

National Centre in HIV Social Research

National Centre in HIV Social Research
Faculty of Arts and Social Sciences
The University of New South Wales



Copies of this monograph or any other publications from this project may be obtained by contacting:

National Centre in HIV Social Research

Level 2, Robert Webster Building
University of New South Wales
Sydney NSW 2052 Australia

Telephone: +61 2 9385 6776
Fax: +61 2 9385 6455
Email: nchsr@unsw.edu.au
Website: <http://nchsr.arts.unsw.edu.au>

© National Centre in HIV Social Research 2011
ISBN 978-1-921493-29-4
Monograph 1/2011

Layout by Judi Rainbow

The National Centre in HIV Social Research (NCHSR) is part of the Faculty of Arts and Social Sciences at the University of New South Wales. NCHSR research projects are partly or fully funded by the Australian Government Department of Health and Ageing.

Suggested citation:

Bryant, J., Wilson, H., & Treloar, C. (2011). *Pharmacy Needle and Syringe Survey, New South Wales 2009* (Monograph 1/2011). Sydney: National Centre in HIV Social Research, The University of New South Wales.

Contents

Acknowledgments	ii
List of tables	iii
List of figures	iv
Key findings	v
Introduction	1
Method	2
Data collection	2
Measures: Metropolitan and non-metropolitan pharmacies	2
Data analysis	2
Response rates	2
Demographic profile	3
Findings	4
Patterns of acquisition of sterile needles and syringes	4
Recent drug use	4
Risk practices for the transmission of blood-borne viruses	7
Self-reported hepatitis C testing and prevalence	9
Self-reported HIV testing and prevalence	10
Knowledge of pharmacy services and patterns of pharmacy use	10
Limitations	12
Conclusion	13
Pharmacy clients in non-metropolitan regions of NSW	13
Knowledge of pharmacy services and patterns of pharmacy use	14
References	15

Acknowledgments

This project was funded by the New South Wales Department of Health and the Faculty Research Grant Scheme of the Faculty of Arts and Social Sciences at the University of New South Wales..

The authors acknowledge the excellent advice and support of the New South Wales branch of the Pharmacy Guild of Australia and are grateful to the staff at participating pharmacies for their time and care in facilitating the data collection, and to the survey respondents.

List of tables

Table 1:	Demographic profile, by year	3
Table 2:	Demographic profile, by region, 2009	3
Table 3:	Site of acquisition of sterile needles and syringes, by year	4
Table 4:	Proportion of respondents who obtained sterile needles and syringes exclusively from pharmacies, by region, 2009	5
Table 5:	Duration of injecting, drug most recently injected, frequency of injecting in the previous month, and treatment for drug use in the previous 12 months, by year	5
Table 6:	Duration of injecting, drug most recently injected, frequency of injecting in the previous month, and treatment for drug use, by region, 2009	6
Table 7:	Reuse of another's needle and syringe and/or ancillary equipment in the previous month, by year	7
Table 8:	Reuse of another's needle and syringe, ancillary equipment, and any equipment in the previous month, by region, 2009	8
Table 9:	Number of people who used needle and syringe before respondent, and respondent's relationship to them, by year	8
Table 10:	Hepatitis C testing and self-reported prevalence, by year	9
Table 11:	Hepatitis C testing and self-reported prevalence, by region, 2009	9
Table 12:	HIV testing and self-reported prevalence, by year	10
Table 13:	HIV testing and self-reported prevalence, by region, 2009	10
Table 14:	How respondents discovered that a pharmacy exchanged needles and syringes, 2009	11
Table 15:	Patterns of pharmacy use by respondents who were using pharmacies a year ago, 2009	11
Table 16:	Reasons for pharmacy use by respondents who were not using pharmacies a year ago, 2009	11

List of figures

Figure 1: Drug most recently injected, by year

7

Key findings

- The demographic profile of respondents to the 2009 NSW Pharmacy Needle and Syringe Survey was largely similar to previous years. Respondents reported an average age of 36 years, about two-thirds were male, around 80% were heterosexual and 18% identified as Aboriginal.
- In 2009, half of respondents (51.8%) reported that, in the previous month, they had exclusively used a pharmacy to obtain sterile needles and syringes.
- In 2009, just under half of respondents (47.2%) reported that they injected daily or more frequently in the previous month. The drug most commonly recently injected was heroin (by 42.7%), followed by meth/amphetamine (by 20.6%) and methadone (by 14.4%). The proportion of respondents who had never received treatment for their drug use was 45.3%.
- During the period between 2007 and 2009, the proportion of respondents who reported injecting cocaine and methadone doubled, from 5.2% to 12.0% for cocaine and from 6.7% to 14.4% for methadone. During the same period there was a significant decline in the proportion injecting meth/amphetamine.
- The high rate of receptive needle and syringe sharing observed in previous years was continued in 2009. Just under a third (30.8%) of respondents reported that they had reused another's needle and syringe in the previous month. The proportion of respondents who reused ancillary equipment such as spoons, water, filters, tourniquets or drug solution increased significantly between 2007 and 2009 from 44.3% to 52.5%.
- In 2009, half (50.0%) of respondents reported having had a recent test for hepatitis C (in the previous 12 months), and just under one third (30.2%) had had their most recent test more than a year ago. Of those who had been tested, 36.2% reported having hepatitis C infection.
- Although the demographic profile of metropolitan and regional respondents was similar, there were significant differences in patterns of use of drugs and health services. Compared to respondents from metropolitan pharmacy settings, respondents from non-metropolitan pharmacies reported that they less commonly used heroin (28.3% versus 45.1%) and cocaine (0.0% versus 14.0%), and more commonly used meth/amphetamines (46.7% versus 16.2%). Respondents from non-metropolitan pharmacies were also significantly less likely to report that they were currently receiving treatment for their drug use (13.3% versus 38.9%) and to have received a recent test for hepatitis C (33.3% versus 53.5%).
- Respondents reported that the most common means of finding appropriate pharmacies to exchange equipment was through word of mouth from other drug users (46.0%) or by asking pharmacy staff (33.8%). Around half of respondents (49.0%) reported that their frequency of pharmacy use had not changed in the previous year.

Introduction

New South Wales (NSW) has an extensive program for distributing sterile needles and syringes through the public and private sectors. Public-sector distribution is free of charge and takes place mainly through stand-alone primary outlets or needle and syringe programs (NSPs). These provide sterile needles and syringes and various types of sterile ancillary injecting equipment (such as filters, swabs, tourniquets and water ampoules). They also provide clients with advice about safe injecting and referrals to other services. Distribution via the public sector also occurs to a lesser extent through emergency wards, community and sexual health centres, mobile distribution programs, and automated dispensing machines. Private-sector distribution takes place through community-based pharmacies by means of a scheme organised and administered by the New South Wales branch of the Pharmacy Guild of Australia. Unique to New South Wales, this scheme allows clients to purchase packets of sterile needles and syringes which can subsequently be exchanged for new packets at no cost. The costs of these needles and syringes and pharmacists' professional fees are covered by the NSW Department of Health (NSW Health, 2006). In 2007/2008 approximately 8,289,886 sterile needles and syringes were distributed through various programs in New South Wales, with about one-fifth distributed through pharmacies (National Centre in HIV Epidemiology and Clinical Research [NCHECR], 2010).

In NSW most of what is known about the risk practices of people who inject drugs (PWID), and thereby are at risk for either acquiring or transmitting blood-borne viruses (BBVs), comes from data collected largely from clients of NSPs. Australia has high-quality ongoing surveillance information from the Australian Needle and Syringe Program (NSP) Survey (NCHECR, 2010) and the Illicit Drug Reporting System (Stafford & Burns, 2009) about those who attend these programs. Our previous research with PWID who were recruited at pharmacies shows that a considerable proportion (one in five) obtained their equipment exclusively from pharmacies, and that this proportion increased in suburban and regional parts of NSW (Bryant, Wilson,

Hull and Treloar, 2010). This suggests that a sizeable proportion of PWID may be excluded from existing surveillance methods. Moreover, our research found a higher incidence of receptive needle sharing (32.4%) and much lower rates of BBV testing and drug treatment than that typically found in the Australian NSP Survey, suggesting the need for increased supply of sterile needles and syringes and better connection to BBV-related services (Bryant, Topp, et al., 2010).

Little research exists on the patterns of drug use and associated harms among PWID who live in regional and rural parts of NSW. Studies show that polydrug use and non-opioid drug use are more common in regional and rural areas, and that sharing needles and other injecting equipment is also common (Lawrinson et al., 2006; Spooner et al., 1996). Service provision, including access to new injecting equipment, BBV testing and drug treatment, is often lacking and PWID in regional areas tend to be less likely to obtain injecting equipment from NSPs (Day et al., 2006). Data collected at pharmacies is a valuable source of information about injecting drug use in regional NSW because, in many of these communities, pharmacies are the only source of sterile injecting equipment.

This report presents data collected as part of a periodic cross-sectional study of people who used community-based pharmacies to obtain sterile needles and syringes in 2009. Specifically, it presents data about the:

- demographic profile of respondents
- patterns of acquisition of needles and syringes
- recent drug use
- self-reported incidence of risk practice for transmission of hepatitis C and HIV
- self-reported rates of testing for hepatitis C and HIV
- self-reported prevalence of hepatitis C and HIV.

Data are stratified by region and, where relevant, data for 2006–2008 are included to show trends.

Data collection

The sampling for this project was conducted in two stages: 1) the selection and recruitment of pharmacies and 2) the recruitment of PWID. Pharmacies were selected using stratified sampling by region, using areas defined by the NSW area health services. A list of pharmacies that participate in the New South Wales Pharmacy Guild's exchange scheme was provided by the NSW Department of Health. Within each area pharmacies were ranked by volume of needle and syringe distribution and those in or above the 80th percentile were invited to facilitate the data collection. Selected pharmacies were mailed a letter of invitation and telephoned one week later to ascertain their willingness to participate. To acknowledge their participation, pharmacists were offered a nominal fee of \$50 plus \$2.50 for each survey they distributed.

During the study period, in December 2009, staff at participating pharmacies distributed a self-complete survey to each person who bought or exchanged sterile needles and syringes. This method of distribution was based on a consecutive sampling approach whereby every person within a given time period was provided with an opportunity to complete the survey. Surveys were self-administered and could be returned to the pharmacy within the study period and exchanged for \$10.

Over the period of the study the sampling area has changed considerable. In 2006, the sampling method was piloted and pharmacies were selected from the south-east Sydney region only. In 2007 and 2008 the study area included the five areas with the largest distribution of needles and syringes in NSW: south-east Sydney, south-west Sydney, central Sydney, western Sydney, which between them encompass nearly all of metropolitan Sydney, and the Newcastle/Hunter Valley region. In 2009, all areas of the state were sampled.

The survey collected information about demographic profile, risk behaviours for the transmission of BBV, patterns of

acquisition of sterile needles and syringes, self-reported testing for hepatitis C and HIV, and whether or not participants tested positive to these infections. Where possible, to allow comparability, the survey used standard items such as behavioural surveillance questions from the Australian NSP Survey (NCHECR, 2009).

The study had approval from the Human Research Ethics Committee of the University of New South Wales and the Pharmacy Guild of Australia.

Measures: Metropolitan and non-metropolitan pharmacies

For the purposes of examining regional differences, data were categorised based on the geographical location of each pharmacy. Pharmacies located in the greater Sydney area were classified as metropolitan and all others were classified as non-metropolitan. These included pharmacies located in the Hunter Valley, Illawarra, Central Coast, Greater Southern, Greater Western, New England and North Coast regions of NSW.

Data analysis

Univariate analyses were conducted on some aspects of the data. Group differences were tested using the χ^2 test for categorical data and the *t*-test for continuous data. Differences over time were tested using the χ^2 test for trend for categorical data and ANOVA for continuous data.

Response rates

In 2009, 58 pharmacies were invited to participate and 40 (69%) agreed. We distributed 624 surveys and 491 were returned (a 78.5% response rate). Twenty-nine surveys were returned blank and another 45 surveys were deemed invalid because of too much missing data or because they were identified as duplicates, leaving 417 valid surveys.

Demographic profile

The demographic profile of respondents in 2009 was largely similar to previous years, with respondents reporting an average age of 36 years. About two-thirds were male, around 80% were heterosexual and 18%

identified as Aboriginal (see Table 1). There were no differences between metropolitan and non-metropolitan respondents on any of the demographic characteristics (see Table 2).

Table 1: Demographic profile, by year

	2006*	2007	2008	2009
Number of pharmacies involved	8	26	34	40
Number of respondents surveyed	229	660	602	417
Response rate %	77.3	78.6	76.9	78.5
Age				
mean	35	35	35	36
age range	18–58	18–64	18–78	18–61
not reported [n (%)]	11 (4.8)	19 (2.9)	20 (3.3)	30 (7.2)
	n (%)	n (%)	n (%)	n (%)
Gender				
male	152 (66.4)	399 (60.5)	391 (65.0)	256 (61.4)
female	71 (31.0)	248 (37.6)	205 (34.1)	147 (35.3)
transgender	4 (1.7)	10 (1.5)	4 (0.7)	14 (3.4)
not reported	2 (0.9)	3 (0.5)	2 (0.3)	0 (0.0)
Sexual identity				
heterosexual	186 (81.2)	533 (80.8)	492 (81.7)	331 (79.4)
gay/lesbian/bisexual	31 (13.5)	98 (14.9)	83 (10.8)	72 (17.3)
other	6 (2.6)	16 (2.4)	13 (2.2)	11 (2.6)
not reported	6 (2.6)	13 (2.0)	14 (2.3)	3 (0.7)
Aboriginality				
Aboriginal	44 (19.2)	103 (15.7)	120 (19.9)	75 (18.0)
other	173 (75.6)	540 (81.8)	468 (77.7)	329 (78.9)
not reported	12 (5.2)	17 (2.6)	14 (2.3)	13 (3.1)

*Data collected for south-east Sydney only.

Table 2: Demographic profile, by region, 2009

	Metropolitan	Non-metropolitan	p-value
Number surveyed	357	60	
Age			ns
mean	36.3	34.5	
range	18–61	19–58	
not reported [n (%)]	27 (7.6)	3 (5.0)	
	n (%)	n (%)	
Gender			ns
male	224 (62.7)	32 (53.3)	
female	119 (33.3)	28 (46.7)	
transgender	14 (3.9)	0 (0.0)	
not reported	0 (0.0)	0 (0.0)	
Sexual identity			ns
heterosexual	279 (78.2)	52 (86.7)	
gay/lesbian/bisexual/other	76 (21.3)	7 (11.7)	
not reported	2 (0.6)	1 (1.7)	
Aboriginality			ns
Aboriginal	69 (19.0)	6 (10.0)	
other	276 (77.3)	53 (88.3)	
not reported	12 (3.4)	1 (1.7)	

Note: p-values are based on χ^2 tests using valid percentages.

Findings

Patterns of acquisition of sterile needles and syringes

In 2009, 40% of respondents reported that they had visited both a pharmacy and an NSP in the month prior to the survey (see Table 3). Furthermore, half (51.8%) of respondents reported exclusively using pharmacies in the previous month.

During 2007–2009, the proportion of respondents who reported exclusive use of pharmacies fluctuated significantly (trend $\chi^2=5.67$, $df=1$, $p=0.02$) (see Table 3). This could be due to changes to the questionnaire where the question determining frequency of pharmacy visits was open-ended in 2008 and closed-ended in other years, or related to changes to the areas sampled over the study period.

There were no differences in the proportion of respondents reporting exclusive pharmacy use by region with over half of respondents from metropolitan (51.3%) and non-metropolitan (55.5%) pharmacies reporting exclusive use of a pharmacy to obtain injecting equipment (see Table 4).

Recent drug use

In 2009 pharmacy clients reported that they had been injecting, on average, for 16 years (range < 1–46). Just under half (47.2%) reported having injected daily or more frequently in the previous month. The drug most recently injected was most commonly heroin (42.7%), followed by meth/amphetamine (20.6%) and methadone (14.4%) (see Table 5).

Table 3: Site of acquisition of sterile needles and syringes, by year

	2006*	2007	2008**	2009	p-value
Number surveyed	229	660	602	417	
	n (%)	n (%)	n (%)	n (%)	
Frequency of use of a pharmacy					
not in the previous month	33 (14.4)	89 (13.5)	53 (8.8)	n/a***	
once in the previous month	52 (22.7)	136 (20.6)	3 (0.5)	120 (28.8)	
less than weekly	53 (23.1)	190 (28.8)	10 (1.7)	113 (27.1)	
a couple of times each week	58 (25.3)	167 (25.3)	62 (10.3)	107 (25.7)	
daily or almost daily	25 (10.9)	61 (9.2)	388 (64.5)	36 (8.6)	
not reported	8 (3.5)	17 (2.6)	86 (14.3)	41 (9.8)	
Frequency of use of an NSP					
not in the previous month	80 (34.9)	279 (42.3)	153 (25.4)	216 (51.8)	
once in the previous month	56 (24.5)	126 (19.1)	143 (23.8)	54 (12.9)	
less than weekly	35 (15.3)	107 (16.2)	91 (15.1)	46 (11.0)	
a couple of times each week	37 (16.2)	91 (13.8)	134 (22.3)	53 (12.7)	
daily or almost daily	10 (4.4)	22 (3.3)	47 (7.8)	14 (3.4)	
not reported	11 (4.8)	35 (5.3)	34 (5.6)	34 (8.2)	
Use of services					0.02
Exclusive use of a pharmacy	80 (34.9)	279 (42.3)	153 (25.4)	216 (51.8)	
Use of both an NSP and a pharmacy	138 (60.3)	346 (52.4)	415 (68.9)	167 (40.0)	

Note: p-values are based on χ^2 tests using valid percentages and are calculated to test differences during 2007–2009.

*In 2006, data were collected for south-east Sydney only.

**the question about frequency of pharmacy visits in the previous month was open-ended in 2008 and closed-ended in 2006, 2007 and 2009.

***In 2009 the question about frequency of pharmacy visits in the previous month was changed so that participants no longer had the option to choose “not in the previous month”.

Table 4: Proportion of respondents who obtained sterile needles and syringes exclusively from pharmacies, by region, 2009

	Metropolitan	Non-metropolitan	p-value
Number surveyed	357	60	
	<i>n (%)</i>	<i>n (%)</i>	
Use of services			
Exclusive use of a pharmacy	183 (51.3)	33 (55.5)	ns
Use of both an NSP and a pharmacy	146 (40.9)	21 (35.0)	

Note: p-values are based on χ^2 tests using valid percentages.

Table 5: Duration of injecting, drug most recently injected, frequency of injecting in the previous month, and treatment for drug use in the previous 12 months, by year

	2006*	2007	2008	2009	p-value
Number surveyed	229	660	602	417	
Duration of injecting (years)					
mean	15	15	16	16	0.03
range	<1–39	<1–44	<1–58	<1–46	
not reported [n (%)]	16 (7.0)	33 (5.0)	33 (5.5)	40 (9.6)	
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	
Drug most recently injected					
heroin	88 (38.4)	276 (41.8)	323 (53.7)	178 (42.7)	ns
meth/amphetamine	47 (20.5)	250 (37.9)	129 (21.4)	86 (20.6)	0.001
cocaine	25 (10.9)	34 (5.2)	38 (6.3)	50 (12.0)	0.001
methadone	13 (5.7)	44 (6.7)	53 (8.8)	60 (14.4)	0.001
pharmaceutical opioids	n/c	18 (2.7)	22 (3.7)	16 (3.8)	
anabolic steroids	n/c	1 (0.2)	2 (0.3)	2 (0.5)	
subutex/buprenorphine	n/c	15 (2.3)	5 (0.8)	8 (1.9)	
other**	39 (17.0)	22 (3.3)	15 (2.5)	6 (1.4)	
not reported	3 (1.3)	0 (0.0)	15 (2.5)	11 (2.6)	
Frequency of injecting					
more than 3 times most days	50 (21.8)	118 (17.9)	107 (17.8)	56 (13.4)	
2 to 3 times most days	46 (20.1)	116 (17.6)	110 (18.3)	58 (13.9)	
once a day	42 (18.3)	126 (19.1)	115 (19.1)	83 (19.9)	
more often than weekly but not daily	46 (20.1)	146 (22.1)	118 (19.6)	97 (23.3)	
less often than weekly	31 (13.5)	101 (15.3)	79 (13.1)	66 (15.8)	
not in the previous month	10 (4.4)	40 (6.1)	44 (7.3)	46 (11.0)	
not reported	4 (1.7)	13 (2.0)	29 (4.8)	11 (2.6)	
Injected daily or more frequently	138 (60.3)	360 (54.5)	332 (55.1)	197 (47.2)	0.05
Had treatment for drug use?					0.002
yes, currently	51 (22.3)	272 (41.2)	226 (37.5)	147 (35.3)	
yes, in the past	83 (36.2)	115 (17.4)	134 (22.3)	42 (10.1)	
no, never	84 (36.7)	250 (37.9)	212 (35.2)	189 (45.3)	
not reported	11 (4.8)	23 (3.5)	30 (5.0)	39 (9.4)	
Any public injecting?					ns
yes	108 (49.3)	273 (44.0)	256 (45.9)	153 (36.7)	
no	107 (48.9)	326 (52.6)	274 (49.1)	204 (48.9)	
not reported	4 (1.8)	21 (3.4)	28 (5.0)	14 (3.4)	

Note: p-values are based on χ^2 tests using valid percentages and are calculated to test differences over the period 2007 to 2009.

*In 2006, data were collected in south-east Sydney only.

**Other includes heroin and cocaine at the same time.

***n/c = not calculated because question format was different

Table 6: Duration of injecting, drug most recently injected, frequency of injecting in the previous month, and treatment for drug use, by region, 2009

	Metropolitan	Non-metropolitan	p-value
Number surveyed	357	60	
Duration of injecting (years)			ns
mean	16.3	14.5	
range	<1-46	1-36	
not reported [n (%)]	37 (10.4)	3 (5.0)	
	n (%)	n (%)	
Drug most recently injected in previous month			
heroin	161 (45.1)	17 (28.3)	0.02
meth/amphetamine	58 (16.2)	28 (46.7)	0.001
cocaine	50 (14.0)	0 (0.0)	0.002
methadone	53 (14.8)	7 (11.7)	ns
pharmaceutical opioids	13 (3.6)	3 (5.0)	
anabolic steroids	2 (0.6)	0 (0.0)	
subutex/buprenorphine	6 (1.7)	2 (3.3)	
other*	5 (1.4)	1 (1.7)	
not reported	9 (2.5)	2 (3.3)	
Frequency of injecting in previous month			
more than 3 times most days	49 (13.7)	7 (11.7)	
2 to 3 times most days	50 (14.0)	8 (13.3)	
once a day	76 (21.3)	7 (11.7)	
more often than weekly but not daily	81 (22.7)	16 (26.7)	
less often than weekly	49 (13.7)	17 (28.3)	
not in the previous month	43 (12.0)	3 (5.0)	
not reported	9 (2.5)	2 (3.3)	
Injected daily or more frequently	175 (49.0)	22 (36.7)	ns
Had treatment for drug use?			0.001
yes, currently	139 (38.9)	8 (13.3)	
yes, in the past	33 (9.2)	9 (15.0)	
no, never	154 (43.1)	35 (58.3)	
not reported	31 (8.7)	8 (13.3)	
Number who had injected in the previous month	305	55	
Any public injecting?			0.04
yes	136 (44.6)	16 (29.1)	
no	166 (54.4)	38 (69.1)	
not reported	3 (1.0)	1 (1.8)	

Note: p-values are based on χ^2 tests using valid percentages.

*Other includes heroin and cocaine concurrently.

A significant increase in the injecting of cocaine and methadone was observed between 2007 and 2009, with a doubling in the proportion of respondents reporting cocaine injecting (5.2% to 12.0%) and methadone injecting (6.7% to 14.4%). During the same period there was a significant decline in meth/amphetamine use with only 20.6% of respondents reporting meth/amphetamine use in 2009 (trend $\chi^2=44.80$ df=1, $p=0.001$) (see Figure 1). There was no change in heroin use between 2007 and 2009. As in previous year, the proportion of respondents who had never received treatment for their drug use was high as 45.3%.

As other research has found (Lawrinson et al., 2006; Day et al., 2006), the drug using profile of respondents varied depending on where they resided (see Table 6). In metropolitan areas, heroin was the drug most commonly injected ($\chi^2=5.90$, df=1, $p=0.02$), and in non-metropolitan areas meth/amphetamine was most commonly injected ($\chi^2=29.04$, df=1, $p=0.001$). No respondents from non-metropolitan areas reported cocaine injecting, suggesting that cocaine use is restricted to urban locations and that the increase in cocaine use observed between 2007 and 2009 was isolated to these settings ($\chi^2=9.55$, df=1, $p=0.002$).

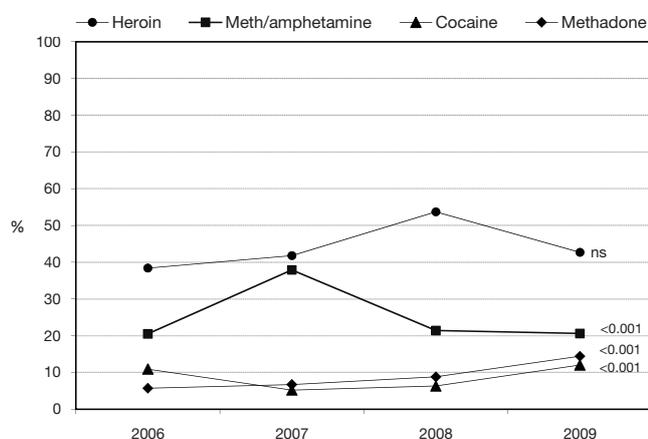


Figure 1: Drug most recently injected, by year

*In 2006, data were collected in south-east Sydney only.

ns = not significant

p-values were calculated to test differences between 2007 and 2009 data.

While having never received treatment for drug use was generally high among respondents in our study, it was significantly more common among those residing in non-metropolitan areas (58.3%) ($\chi^2=14.26$, $df=2$, $p=0.001$). Over half (58.3%) of non-metropolitan respondents reported that they had never had treatment for their drug use.

Risk practices for the transmission of blood-borne viruses

In 2009, injecting practices that posed a high risk for the transmission of blood-borne viruses were common. Just under a third (30.8%) of pharmacy clients reported having reused another's needles and syringes in the previous month, and half (52.5%) reported having reused or shared ancillary injecting equipment (see Table 7). While the incidence of receptive needle sharing remained stable and high, the proportion of respondents who reused ancillary

Table 7: Reuse of another's needle and syringe and/or ancillary equipment in the previous month, by year

	2006*	2007	2008	2009	p-value
Number who had injected in the previous month	215	607	529	360	
Frequency of reuse of another's needle and syringe					
more than 5 times	13 (6.0)	42 (6.9)	43 (8.1)	30 (8.3)	
3 to 5 times	13 (6.0)	41 (6.8)	45 (8.5)	36 (10.0)	
twice	18 (8.4)	44 (7.2)	53 (10.0)	27 (7.5)	
once	24 (11.2)	31 (5.1)	37 (7.0)	18 (5.0)	
never	145 (67.4)	435 (71.7)	333 (62.9)	242 (67.2)	
not reported	2 (0.9)	14 (2.3)	18 (3.4)	7 (1.9)	
Any reuse of another's needle and syringe					ns
yes	68 (31.6)	158 (26.0)	178 (33.6)	111 (30.8)	
no	145 (67.4)	435 (71.7)	333 (62.9)	242 (67.2)	
not reported	2 (0.9)	14 (2.3)	18 (3.4)	7 (1.9)	
Reuse of particular types of ancillary equipment					
spoon	104 (48.4)	196 (32.2)	199 (37.6)	136 (37.8)	
water	71 (33.0)	162 (26.7)	146 (27.6)	118 (32.8)	
filter	49 (22.8)	106 (17.5)	100 (18.9)	85 (23.6)	
tourniquet	44 (20.5)	73 (12.0)	54 (10.2)	50 (13.9)	
drug solution/mix	37 (17.2)	80 (13.2)	62 (11.7)	66 (18.3)	
not reported	n/c	29 (4.8)	19 (3.6)	23 (6.4)	
Reuse of any ancillary equipment					0.004
yes	141 (65.6)	269 (44.3)	265 (50.1)	189 (52.5)	
no	74 (34.4)	309 (50.9)	245 (46.3)	148 (41.1)	
not reported	n/c	29 (4.8)	19 (3.6)	23 (6.4)	
Reuse of any equipment					0.004
yes	146 (67.9)	306 (50.4)	315 (59.5)	213 (59.2)	
no	69 (32.1)	293 (48.3)	208 (39.9)	144 (40.0)	
not reported	n/c	8 (1.3)	6 (1.1)	3 (0.8)	

Note: p-values are based on χ^2 tests using valid percentages and are calculated to test differences over the period 2007 to 2009.

*In 2006, data was collected in south-east Sydney only.

n/c = not calculated because question format in 2006 was different

ns = not significant

equipment increased significantly between 2007 and 2009 from 44.3% to 52.5% (trend $\chi^2=8.17$, $df=1$, $p=0.004$). In total, almost two-thirds (59.2%) of respondents in 2009 had reused or shared any kind of equipment, indicating that a high proportion of respondents were at risk for acquiring or passing on hepatitis C.

There were no significant differences in the risk profile of respondents from metropolitan and non-metropolitan pharmacies (see Table 8), suggesting that risk for the transmission of blood-borne viruses was high regardless of where respondents resided.

In 2009, 41.1% of respondents who had reused another's needle and syringe reported that they had usually done so after one other person, most commonly a regular sexual partner (reported by 44.6%) (see Table 9). This corresponds with other published research demonstrating that people who inject tend to share equipment with others they know well (Loxley & Ovenden, 1995; Loxley & Davidson, 1998; Rhodes & Quirk, 1998). Even though the sharing of equipment among pharmacy clients usually takes place with a small number of well-known others, it is still likely to carry a high risk for the transmission of blood-borne viruses.

Table 8: Reuse of another's needle and syringe, ancillary equipment, and any equipment in the previous month, by region, 2009

	Metropolitan	Non-metropolitan	<i>p</i> -value
Number who injected in the previous month	305	55	
	<i>n</i> (%)	<i>n</i> (%)	
Reuse of another's needle and syringe			ns
yes	100 (32.8)	11 (20.0)	
no	200 (65.6)	42 (76.4)	
not reported	5 (1.6)	2 (3.6)	
Reuse of ancillary equipment			ns
yes	165 (54.1)	24 (43.6)	
no	121 (39.7)	27 (49.1)	
not reported	19 (6.2)	4 (7.3)	
Reuse of any equipment			ns
yes	183 (60.0)	30 (54.5)	
no	119 (39.0)	25 (45.5)	
not reported	3 (1.0)	0 (0.0)	

Note: *p*-values are based on χ^2 tests using valid percentages.

ns = not significant

Table 9: Number of people who used needle and syringe before respondent, and respondent's relationship to them, by year

	2006*	2007	2008	2009
Number who reused a needle and syringe in the previous month	70	160	181	112
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Number who used the needle and syringe before respondent				
more than 5 people	8 (11.4)	22 (13.8)	20 (11.0)	13 (11.6)
3 to 5 people	6 (8.6)	21 (13.1)	21 (11.6)	11 (9.8)
2 people	8 (11.4)	15 (9.4)	22 (12.2)	12 (10.7)
one person	25 (35.7)	62 (38.8)	80 (44.2)	46 (41.1)
don't know how many	0 (0.0)	19 (11.9)	19 (10.5)	19 (7.0)
not reported	0 (0.0)	21 (13.1)	19 (10.5)	11 (9.8)
Relationship to person after whom needle and syringe was used				
regular sex partner	18 (25.7)	77 (48.1)	76 (42.0)	50 (44.6)
casual sex partner	8 (11.4)	20 (12.5)	23 (12.7)	17 (15.2)
close friend	15 (21.4)	35 (21.9)	43 (23.8)	27 (24.1)
acquaintance	6 (8.6)	14 (8.8)	27 (14.9)	11 (9.8)
other	2 (2.9)	7 (4.4)	14 (7.7)	12 (10.7)
not reported	2 (2.9)	26 (16.3)	21 (11.6)	12 (10.7)

*In 2006, data were collected only in south-east Sydney.

Self-reported hepatitis C testing and prevalence

In 2009, half (50.0%) of respondents reported having had a recent test (in the previous 12 months) for hepatitis C, and just under a third (30.2%) had had their most recent test more than a year ago. Of those who had been tested, 36.2% reported having hepatitis C infection. The proportion of those who had been tested for hepatitis C fluctuated significantly between 2007 and 2009 ($\chi^2=13.55$, $df=1$, $p=0.001$) (see Table 10).

The proportion of respondents who reported having ever been tested for hepatitis C was similar in metropolitan and non-metropolitan settings; however, significantly fewer respondents from non-metropolitan areas reported having been tested recently (33.3% versus 53.5%, $\chi^2=9.67$, $df=3$, $p=0.02$) (see Table 11). The self-reported prevalence of hepatitis C was similar with approximately one-third of metropolitan and non-metropolitan respondents reporting positive status.

Table 10: Hepatitis C testing and self-reported prevalence, by year

	2006*	2007	2008	2009	p-value
Number surveyed	229	660	602	417	
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	
Had a hepatitis C test?					0.001
yes, last year	144 (62.9)	364 (55.2)	326 (54.2)	211 (50.0)	
over a year ago	59 (25.8)	208 (31.5)	156 (25.9)	126 (30.2)	
never tested	8 (3.5)	62 (9.4)	82 (13.6)	35 (8.4)	
unsure	10 (4.4)	11 (1.7)	17 (2.8)	27 (6.5)	
not reported	8 (3.5)	15 (2.3)	21 (3.5)	18 (4.3)	
Number who had ever had a hepatitis C test	203	572	482	337	
	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	
Self-reported hepatitis C status					ns
positive	92 (45.3)	255 (44.6)	232 (48.1)	122 (36.2)	
negative	102 (50.2)	239 (41.8)	177 (36.7)	170 (50.4)	
don't know result	n/c	25 (4.4)	20 (4.1)	14 (4.2)	
not reported	9 (4.4)	53 (9.3)	53 (11.0)	31 (9.2)	

Note: *p*-values are based on χ^2 tests using valid percentages and are calculated to test differences over the period 2007 to 2009.

*Data collected for south-east Sydney only.

n/c = not calculated because question format was different

Table 11: Hepatitis C testing and self-reported prevalence, by region, 2009

	Metropolitan	Non-metropolitan	p-value
Number surveyed	357	60	
	<i>n (%)</i>	<i>n (%)</i>	
Previous hepatitis C test?			0.02
yes, last year	191 (53.5)	20 (33.3)	
over a year ago	99 (27.7)	27 (45.0)	
never tested	31 (8.7)	4 (6.7)	
unsure	23 (6.4)	4 (6.7)	
not reported	13 (3.6)	5 (8.3)	
Number who had ever had a hepatitis C test	290	47	
Self-reported hepatitis C status			ns
positive	109 (37.6)	13 (27.7)	
negative	140 (48.3)	30 (63.8)	
don't know result	12 (4.1)	2 (4.3)	
not reported	29 (10.0)	2 (4.3)	

Note: *p*-values are based on χ^2 tests using valid percentages.

Self-reported HIV testing and prevalence

In 2009, self-reported HIV prevalence was low among pharmacy clients at about 4% (see Table 12). As expected, rates of testing for HIV were similar to those for hepatitis C, with more than half of respondents (52.3%) having had a recent HIV test (see Table 12). Over the study period, there were no significant changes in rates of HIV testing or prevalence of self-reported HIV status these did not vary by region (see Table 13).

Knowledge of pharmacy services and patterns of pharmacy use

In recent years there has been a decrease in the number of sterile needles and syringes distributed by the pharmacy sector in NSW. The 2009 questionnaire included a range of special topic questions aimed at describing respondents' knowledge about pharmacy services and their patterns of use over the previous year in order to gain some understanding about the decline in use of pharmacy services. As a part of this, the questionnaire included a

Table 12: HIV testing and self-reported prevalence, by year

	2007	2008	2009	<i>p</i> -value
Number surveyed	660	602	417	
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	
Had HIV test?				ns
yes, in previous year	369 (55.9)	334 (55.5)	218 (52.3)	
more than a year ago	164 (24.8)	133 (22.1)	106 (25.4)	
never tested	84 (12.7)	88 (14.6)	46 (11.0)	
unsure	22 (3.3)	25 (4.2)	25 (6.0)	
not reported	21 (3.2)	22 (3.7)	22 (5.3)	
Self-reported HIV status				ns
positive	8 (1.2)	13 (2.2)	16 (3.8)	
negative	469 (71.1)	395 (65.6)	277 (66.4)	
don't know result	23 (3.5)	21 (3.5)	6 (1.4)	
never tested/unsure	84 (12.7)	88 (14.6)	71 (17.0)	
not reported	76 (11.5)	85 (14.1)	47 (11.3)	

Note: *p*-values are based on χ^2 tests using valid percentages.

Table 13: HIV testing and self-reported prevalence, by region, 2009

	Metropolitan	Non-metropolitan	<i>p</i> -values
Number surveyed	357	60	
	<i>n</i> (%)	<i>n</i> (%)	
Had HIV test?			ns
yes, last year	192 (53.8)	26 (43.3)	
more than a year ago	88 (24.6)	18 (30.0)	
never tested	37 (10.4)	9 (15.0)	
unsure	23 (6.4)	2 (3.3)	
not reported	17 (4.8)	5 (8.3)	
Self-reported HIV status			ns
positive	16 (4.5)	0 (0.0)	
negative	236 (66.1)	41 (68.3)	
don't know result	4 (1.1)	2 (3.3)	
never tested/unsure	60 (16.8)	11 (18.3)	
not reported	41 (11.5)	6 (10.0)	

Note: *p*-values are based on χ^2 tests using valid percentages.

colour reproduction of the double arrow symbol used by pharmacies in NSW to notify the public that they operate an exchange. The symbol is usually in the form of a sticker placed in the shop front. Out of the total sample, 55.4% of respondents reported that they had seen the double arrow symbol at a pharmacy. Of those who had seen the symbol, 81.4% knew the correct purpose of it. Respondents were also asked how they discovered which pharmacies operated an exchange, and if they knew of any other pharmacies that provided a similar service. The most common means of finding exchange pharmacies was through word of mouth from other drug users (46.0%) although it was also very common for respondents to ask pharmacy staff if the pharmacy had exchange services (33.8%). Only 16.5% of respondents reported that they used the double arrow symbol to find pharmacies (see Table 14). Thus although the symbol is widely recognised by PWID it is not widely used to find exchange pharmacies. In fact, many respondents (42.4%) reported that they knew of only one pharmacy where they could obtain equipment (that is, the pharmacy where they completed their survey). Half (51.1%) of respondents reported knowing of another pharmacy that exchanged, with these respondents knowing an average of four other pharmacies (range = 1–20).

Around half (49.0%) of respondents reported that their frequency of pharmacy use had not changed in the previous

Table 14: How respondents discovered that a pharmacy exchanged needles and syringes, 2009

Number surveyed	417
	<i>n (%)</i>
Another drug user told me	192 (46.0)
I asked the pharmacy staff	141 (33.8)
I saw the arrow symbol at the pharmacy	69 (16.5)
Other	31 (7.4)
Staff at the NSP told me	26 (6.2)
Staff at another pharmacy told me	25 (6.0)
A doctor told me	16 (3.8)

year; however about one-third (29.8%) said they were using pharmacies more often than last year and 15.5% were using them less often than last year (see Table 15).

Respondents who reported only recently (<12 months) using pharmacies to obtain their needles and syringes, reported that they used pharmacies now because the pharmacy was convenient to get to (26.2%) and that they were injecting more often (25.4%) (see Table 16). This data suggests that clients' use of pharmacy exchange services is driven by changes in their individual injecting patterns, as well as some of the known features of using pharmacies that have been described in previous research such as convenience (Treloar et al, 2010).

Table 15: Patterns of pharmacy use by respondents who were using pharmacies a year ago, 2009

Number who were getting fitpacks from a pharmacy a year ago	245
	<i>n (%)</i>
How often were you getting fitpacks from a pharmacy this time last year (November 2008)	
More often than now	73 (29.8)
About the same	120 (49.0)
Less often than now	38 (15.5)
Not reported	14 (5.7)

Table 16: Reasons for pharmacy use by respondents who were *not* using pharmacies a year ago, 2009

Number who were not getting fitpacks from a pharmacy a year ago	126
	<i>n (%)</i>
Main reason for using a pharmacy more now	
The pharmacy is convenient to get to	33 (26.2)
I'm injecting more often now	32 (25.4)
I prefer the pharmacy	16 (12.7)
Other	15 (11.9)
I get methadone at the pharmacy	13 (10.3)
The pharmacy is open when I need fitpacks	11 (8.7)
Not reported	6 (4.8)

Limitations

The findings in this report have several important limitations. Although we have some measures of the representativeness of the sample, we used non-probability sampling methods and do not know to what extent the findings can be generalised to the wider population of those who inject drugs and collect needles and syringes from pharmacies. Using our response-rate measures, we know that in 2009 participating pharmacies accounted for 51.9% of the total distribution of sterile needles and

syringes dispensed by pharmacies in general, and that participating clients represented 78.5% of injecting-drug-using clients at those pharmacies. Also, data are self-reported and this can lead to bias, especially when reporting sensitive or illegal behaviours (Latkin & Vlahov, 1998; Latkin et al., 1993). In particular, self-reported hepatitis C status is known to have poor concordance with laboratory-confirmed serostatus (Hagan et al., 2006; Stein et al., 2007; Best et al., 1999).

Conclusion

The findings of this report reflect what has been found in earlier reports of this study (Bryant et al., 2010), that pharmacies continue to attract clients that are less likely to use other services and are more likely to report risky injecting practices. About half of our respondents reported that they had exclusively used a pharmacy to obtain sterile needles and syringes in the previous month, many had never received any treatment for their drug use despite reporting that they had been injecting for an average of 16 years, and many had not had a recent test for hepatitis C or HIV. In addition, we observed continued high rates of receptive needle and other equipment sharing among our sample. These findings identify a need to increase the use of sterile equipment among pharmacy clients, and to better connect them with appropriate services for testing and treatment. The high rates of reuse of ancillary injecting equipment is particularly concerning and, as argued in our previous report, could be partly addressed by offering clients pre-packaged containers of ancillary equipment, either free of charge, at reduced cost (if subsidised) or at full cost. Pharmacies in other Australian states offer such packages to clients, usually at the expense of the purchaser. Improving pharmacy clients' connection to other health services could be partly achieved by training pharmacy staff about where to refer clients. The training would need to include guidance about how to initially engage clients, since other research shows that pharmacy clients are attracted to pharmacies precisely because of the anonymity and quick transaction available there (Treloar et al., 2010). Nevertheless, pharmacy staff already counsel a substantial number of general customers about various health issues, so are well placed to provide referrals and advice to people who inject.

During the period 2007 to 2009, we observed some significant shifts in the types of drugs used by pharmacy clients. While heroin continued to be the most common last drug injected, there was a sustained decline in meth/amphetamine injecting, as has been reported in other

surveys (NCHECR, 2010). In our survey, the proportion of respondents reporting cocaine and methadone injecting increased significantly between 2007 and 2009, in both cases doubling, and this has not been reported in other surveys (NCHECR, 2010). Although the total proportion of respondents injecting cocaine is small (12% at the highest in 2009) the increase in cocaine use is concerning and should be monitored. Stimulant drugs like cocaine have been found to drive BBV infection rates in international settings (Tyndall et al., 2003). The increasing use of methadone injecting is not surprising given the data is collected in a pharmacy setting and pharmacies tend to be the only venues where appropriate equipment for methadone injecting can be obtained. However, the growing numbers of clients who inject methadone has implications for pharmacy staff and the level of support and service they can offer. Evidence shows that people who inject methadone experience poorer general health, more injection-related harms, and higher levels of psychological distress than those who do not inject methadone (Darke et al., 1996; Humeniuk et al., 2003; Hopwood et al., 2003). Again this suggests that pharmacy staff might have specific training needs in order to provide appropriate services to this group of clients.

Pharmacy clients in non-metropolitan regions of NSW

Compared to our respondents from metropolitan settings, respondents from non-metropolitan pharmacies reported that they more commonly used meth/amphetamines and that they less commonly used treatment and testing services. A number of earlier Australian studies have also found that meth/amphetamine use is more common outside of urban settings (Shearer, 2009; McKetin et al., 2005; Lawrinson et al., 2006) and this has been attributed to patterns of drug supply and the greater availability of synthetic drugs in regional areas (Australian

Crime Commission, 2003). The higher prevalence of meth/amphetamine injecting in regional areas has some implications for pharmacists in these settings. It may mean that there are limited treatment services in which to refer clients since there are currently limited options with regard to meth/amphetamine dependence. Also, there is evidence that links meth/amphetamine use with aggressive behaviour and mental health problems like psychosis (McKetin et al., 2005; Wright & Klee, 2001) which may pose additional challenges to pharmacy staff.

Findings from our previous report suggest that a higher proportion of respondents from non-metropolitan settings used pharmacies exclusively to obtain needles and syringes. The findings of the current report show no difference in this regard. This is different from previous Australian studies such as Day et al. (2006) who found that more rural than metropolitan participants reported pharmacies as their usual source of injecting equipment. Our findings may suggest that many respondents from regional settings have alternate sources of injecting equipment.

There were some differences in patterns of use of health care services between metropolitan and non-metropolitan respondents. Non-metropolitan respondents were more likely have never received treatment for their drug use and much less likely to have had a recent test for hepatitis C. Almost 60% of non-metropolitan respondents reported that they had never had treatment for their drug use, despite having injected for an average of 16 years. Similar patterns have been identified in other research (Lawrinson et al. 2006) whereby pharmacotherapy patients in rural and regional areas were more likely to have referred themselves to treatment compared with their urban counterparts. While a proportion of pharmacy clients would not want or need treatment, it is important that those that do are supported to do so. Pharmacists in regional areas may be well-placed to encourage clients to take up pharmacotherapy treatment because many pharmacists dispense pharmacotherapy and are familiar with treatment requirements and systems. In our study, non-metropolitan respondents were also less likely to report having a hepatitis C test in the last year, with only a third reporting having had a test in this time. Day et al. (2006) also found that rural participants in their study reported a longer median time since testing than metropolitan participants. Our findings highlight a significant gap in service provision to people who inject and who live in regional areas. Increasing participation in drug treatment is known to reduce the frequency of injecting and thereby the risk for acquiring BBV. Similarly, frequent testing ensures that a person knows their serostatus which similarly may moderate risk behaviour.

Knowledge of pharmacy services and patterns of pharmacy use

Although more than half of respondents reported having seen the double arrow symbol at a pharmacy, and although the majority who saw it correctly identified its purpose, less than one in five respondents reported having used the symbol to find the pharmacy they currently use. Respondents were more likely to say that they learned about the pharmacy from other drug users or by asking the staff at the pharmacy. We do not know the extent to which pharmacies display the double arrow symbol, which may explain why respondents depend on information from their peers or pharmacy staff. Other research suggests that pharmacies may be a first point of contact for new or young injectors (Bryant, Wilson, Hull, Lavis, et al., 2010) since it is commonly known that needles and syringes are available at community pharmacies. This is one reason why it is important for pharmacies that exchange needles and syringes to identify themselves as such wherever possible. More research about how drug users source sterile needles and syringes, in particular young drug users, would be useful in order to better understand the role that pharmacies play in this process, and the importance of identifying markers such as the double arrow symbol.

Our findings showed that many respondents (about 60%) knew of a number of pharmacies in their area where they could obtain equipment. While we did not ask whether they knew about other venues in their area, such as NSP or automatic dispensing machines, these findings suggest that many respondents know of a number of other places where they can obtain sterile equipment and, in particular, places such as pharmacies that are open evenings and weekends. Many respondents reported that their frequency of using a pharmacy to obtain equipment had changed in the previous year, with about half saying that they used pharmacies more or less often than before. Changes in individual patterns of pharmacy use are important to consider but do not help us to understand other factors that may be driving the decline in pharmacy distributions in NSW. Such factors might include a decline in the total population of PWID, or structural features such as changes in pharmacy workforce and their attitudes towards needle and syringe exchange services, or an increasing presence of high quality primary NSP and a subsequent decrease in demand for secondary services such as pharmacies. More research is necessary to understand the overall decline in pharmacy needle and syringe distributions in NSW.

References

- Australian Crime Commission (2003). *Australian Illicit Drug report 2001–02*. Canberra: Commonwealth of Australia.
- Best, D., Noble, A., Finch, E., Gossop, M., Sidwell, C., & Strang, J. (1999). Accuracy of perceptions of hepatitis B and C status: Cross sectional investigation of opiate addicts in treatment. *British Medical Journal*, *319*, 290–291.
- Bryant, J., Topp, L., Hopwood, M., Iversen, J., Treloar, C., & Maher, L. (2010). Is point of access to needles and syringes related to needle sharing? Comparing data collected from pharmacies and needle and syringe programs in south east Sydney. *Drug and Alcohol Review*, *29*, 364–370.
- Bryant, J., Wilson, H., Hull, P., Lavis, Y., & Treloar, C. (2010). *Drug use, hepatitis C and exposure to injecting among young people in New South Wales: The Big Day Out Survey 2006–2009*. Sydney: National Centre in HIV Social Research, The University of New South Wales.
- Bryant, J., Wilson, H., Hull, P., & Treloar, C. (2010). *Pharmacy Needle and Syringe Survey 2006–2008: New South Wales*. Sydney: National Centre in HIV Social Research, The University of New South Wales.
- Darke, S., Ross, J., & Hall, W. (1996). Prevalence and correlates of the injection of methadone syrup in Sydney, Australia. *Drug and Alcohol Dependence*, *43*(3), 191–198.
- Day, C., Conroy, E., Lowe, J., Page, J., & Dolan, K. (2006). Patterns of drug use and associated harms among rural injecting drug users: Comparisons with metropolitan injecting drug users. *Australian Journal of Rural Health*, *14*, 120–125.
- Hagan, H., Campbell, J., Thiede, H., Strathdee, S., Ouellet, L., Kapadia, F., Hudson, S., & Garfein, R. S. (2006). Self-reported hepatitis C virus antibody status and risk behaviour in young injectors. *Public Health Reports*, *121*, 710–719.
- Hopwood, M., Southgate, E., Kippax, S., Bammer, G., Isaac-Toua, G., & MacDonald, M. (2003). The injection of methadone syrup in New South Wales: patterns of use and increased harm after partial banning of injecting equipment. *Australian and New Zealand Journal of Public Health*, *27*(5), 551–555.
- Humeniuk, R., Ali, R., McGregor, C., & Darke, S. (2003). Prevalence and correlates of intravenous methadone syrup administration in Adelaide, Australia. *Addiction*, *98*, 413–418.
- Latkin, C. A., & Vlahov, D. (1998). Socially desirable response tendency as a correlate of accuracy of self-reported HIV serostatus for HIV seropositive injection drug users. *Addiction*, *93*, 1191–1197.
- Latkin, C. A., Vlahov, D., & Anthony, J. C. (1993). Socially desirable responding and self-reported HIV infection risk behaviours among intravenous drug users. *Addiction*, *88*, 517–525.
- Lawrinson, P., Copeland, J., & Indig, D. (2006). Regional differences in injecting practices and other substance use-related behaviour among entrants into opioid maintenance pharmacotherapy treatment in New South Wales, Australia. *Drug and Alcohol Dependence*, *82*(Suppl 1), S95–S102.
- Loxley, W., & Davidson, R. (1998). How rational is needle sharing to young injecting drug users? *Addiction Research*, *6*, 499–515.
- Loxley, W., & Ovenden, C. (1995). Friends and lovers: Needle sharing in young people in Western Australia. *AIDS Care*, *7*, 337–351.
- McKetin, R., McLaren, J., & Kelly, E. (2005). *The Sydney methamphetamine market: Patterns of supply, use, personal harms and social consequences*. National Drug Law Enforcement Research Fund (Monograph Series No. 13). Adelaide: Australasian Centre for Policing Research.
- National Centre in HIV Epidemiology and Clinical Research [NCHECR]. (2009). *Return on investment 2: Evaluating the cost-effectiveness of needle and syringe programs in Australia*. Sydney: National Centre in HIV Epidemiology and Clinical Research, The University of New South Wales.
- National Centre in HIV Epidemiology and Clinical Research [NCHECR]. (2010). *Australian NSP Survey national data report 2005–2009*. Sydney: National Centre in HIV Epidemiology and Clinical Research, The University of New South Wales.
- NSW Department of Health. (2006). *Needle and syringe program policy and guidelines for NSW 2006*. Sydney: NSW Department of Health. Available online at http://www.health.nsw.gov.au/policies/pd/2006/PD2006_037.html
- Rhodes, T., & Quirk, A. (1998). Drug users' sexual relationships and the social organisation of risk: The sexual relationship as a site of risk management. *Social Science & Medicine*, *2*, 157–169.
- Shearer, J. (2009). Treatment responses to problematic methamphetamine use: the Australian experience. In R. Pates & D. Riley (Eds.), *Interventions for amphetamine misuse*. London: Wiley-Blackwell.
- Spooner, C., Bishop, J., & Parr, J. (1996). Unsafe injecting practices and risk reduction in a non-metropolitan setting. *Health Promotion Journal of Australia*, *6*, 54–56.

Stafford, J., & Burns, L. (2010). *Australian Drug Trends 2009. Findings from the Illicit Drug Reporting System (IDRS)*. Australian Drug Trend Series No. 37. Sydney: National Drug and Alcohol Research Centre, The University of New South Wales.

Stein, M. D., Maksad, J., & Clarke, J. (2007). Hepatitis C disease among injection drug users: Knowledge, perceived risk and willingness to receive treatment. *Drug and Alcohol Dependence*, 61, 211–215.

Treloar, C., Hopwood, M., Bryant, J. (2010). 'Does anyone know where to get fits from around here?':

Policy implications for the provision of sterile injecting equipment through pharmacies in Sydney, Australia. *Drugs: Education, Prevention and Policy*, 17(1), 72–83.

Tyndall, M.W., Currie, S., Spittal, P., Li, K., Wood, E., O'Shaughnessy, M.V. et al. (2003). Intensive injection cocaine use as the primary risk factor in the Vancouver HIV-1 epidemic. *AIDS*, 17(6), 887–893.

Wright, S., & Klee, H. (2001). Violent Crime, Aggression and Amphetamine: what are the implications for drug treatment services? *Drugs: Education, Prevention and Policy*, 8(1), 73–90.