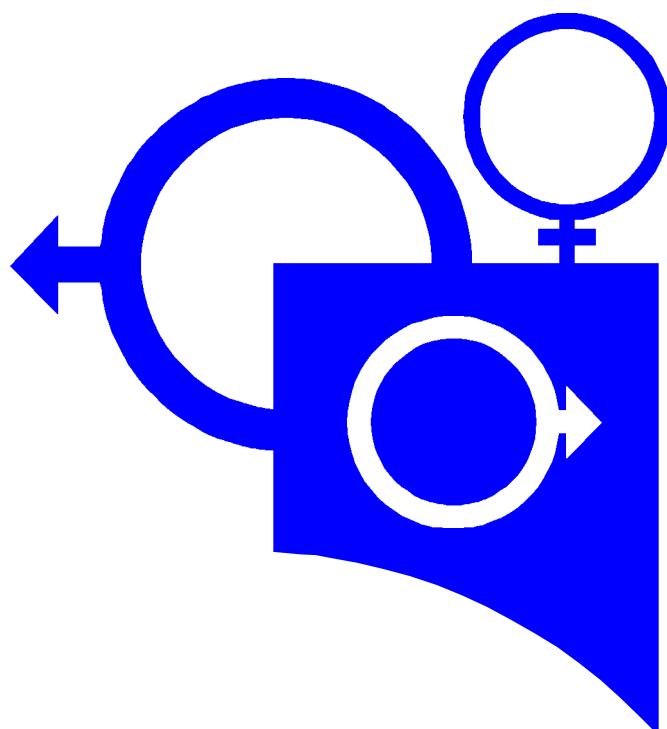


Sexually Transmitted Diseases Services Quarterly Surveillance Report

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Increasing antibiotic resistance of bacteria is of concern in the control of sexually transmitted diseases. In Australia, gonococcal isolates are routinely monitored for antibiotic susceptibility in the laboratory. This article describes South Australian links between emerging patterns of resistance and epidemiologic information.

Antibiotic sensitivity of *Neisseria gonorrhoeae* isolates in South Australia in 1999.

The capacity of *Neisseria gonorrhoeae* to develop resistance to antimicrobial agents used for the treatment of gonorrhoea is well known. In Australia, the progressive emergence and spread of antibiotic resistant gonococci has been observed, and, in some countries near Australia, high proportions of gonococcal isolates are resistant to several antibiotics.¹

The antibiotic susceptibility of *Neisseria gonorrhoeae* in Australia is monitored by the Australian Gonococcal Surveillance Programme (AGSP) which is a collaborative programme conducted by reference laboratories in each State and Territory. The South Australian reference laboratory is the Infectious Diseases Laboratories of the Institute of Medical and Veterinary Science (IMVS). All isolates of *Neisseria gonorrhoeae* are examined for susceptibility to penicillin (representing this group of antibiotics), ceftriaxone (representing later generation cephalosporins), ciprofloxacin (representing quinolones), spectinomycin, and high level resistance to tetracycline.¹

In 1999, 243 cases of sexually transmitted gonorrhoea were notified in South Australia. Whilst *Neisseria gonorrhoeae* was isolated from 129 of these cases (53%), 84 viable samples were received by the IMVS for further testing. Hence, antibiotic sensitivity results were notified to STD Services for 84 (65%) of the 129 cases. The remaining 114 cases (47%) were diagnosed by polymerase chain reaction testing (PCR) of, predominantly, urine samples submitted from remote communities where annual screening programs have been implemented.

Antibiotic Susceptibility Results

During 1999, 84 viable specimens were available for standardised testing against a panel of antibiotics used for the treatment of gonorrhoea; these data were then analysed, correlating isolate results to medical notification information.

Penicillins

In 1999, 66 (78%) cases were classified as sensitive to penicillin (Table 1). However only four cases (4%) were fully sensitive (minimum inhibition concentration - MIC \leq 0.008-0.03ug/ml), with 62 cases (74%) being less sensitive (MIC 0.06-0.5ug/ml) to penicillin.

Resistance to the penicillin group (penicillin, ampicillin, amoxycillin) may be mediated by the production of beta-lactamase (penicillinase-producing *N. gonorrhoeae* - PPNG) or by chromosomally-controlled mechanisms (CMRNG).^{1,2}

Eighteen cases (22%) showed resistance to penicillin, including three cases (4%) of PPNG (Table 1). This incidence of PPNG was within the range (0-12%) occurring in the years from 1984 to 1998.³

All three PPNG cases (one female, two males) were Caucasians who acquired the infection in South Australia. Male-to-male sex was reported for one case. Nationally from 1998 to 1999, the AGSP recorded an increase in PPNG from 5.3% to 7.4% of all isolates, with New South Wales (NSW) and Western Australia (WA) recording 9.7% and 9.6% PPNG, respectively.¹

Since 1995, an increase in chromosomal mediated resistance (CMR) to penicillin has been observed in South Australia.³ During 1999, 15 cases (18%) demonstrated CMR. Fourteen cases were male and one female; ten of the fourteen males reported male-to-male sex. Eleven cases were acquired in South Australia (predominantly in urban areas), two were acquired interstate and two overseas. Thirteen cases were Caucasian, one case was Aboriginal and one case was Asian. Nationally the AGSP recorded a fall in CMR from 21.8% to 14.3% of isolates between 1998 and 1999. The proportion of CMR varied amongst states with South Australia (18%) and NSW (24.6%) recording high levels of CMR and WA (2%) and Northern Territory (1.6%) recording low levels.¹

Ceftriaxone and Spectinomycin

Both in South Australia and nationally, all isolates were sensitive to Ceftriaxone and Spectinomycin.¹

Ciprofloxacin

Eighty two cases (98%) were sensitive to Ciprofloxacin and two cases (2%) were resistant (Quinolone resistant *N. gonorrhoeae* - QRNG) (Table 1). Both cases of QRNG, one male and one female, were Caucasian and acquired their infections in South Australia. Nationally, the AGSP noted a rise in QRNG between 1998 and 1999 from 5.2% to 17.2% of isolates. The number of QRNG isolates observed in Australia in 1999 (628) was more than three times the 186 isolates noted in 1998, with 90% of 1999 QRNG isolates reported from NSW or Victoria.¹

Tetracycline

In South Australia, gonococcal isolates are tested at a single concentration of tetracycline (16mg/ml) to measure high level resistance. Eighty isolates (95%) were not tetracycline resistant *N. gonorrhoeae* (not-TRNG) at this level, and four isolates (5%) were resistant (TRNG) (Table 1). Three males, with female partners, acquired the infection in Indonesia; and one female acquired the infection in South Australia from a partner who had been infected overseas. Nationally, 7.9% of isolates in 1999 were TRNG, with most cases being acquired overseas.¹

Table 1 Antibiotic sensitivity for South Australian Cases of gonorrhoea isolated in 1999.

Antibiotic Sensitivity	Antibiotic				
	Penicillin	Ceftriaxone	Ciprofloxacin	Spectinomycin	Tetracycline
Fully sensitive	4	81	80	84	<i>not assessed</i>
Less sensitive	62	3	2	-	80
Resistant	18	-	2	-	4
non-PPNG	15			-	
PPNG	3				

Antibiotic Treatment

In South Australia the continued surveillance and monitoring of gonococcal isolates led to altered treatment regimes for gonorrhoea in June 1998. Intramuscular ceftriaxone (250mg) is the drug of choice for gonorrhoea. Ciprofloxacin (500mg oral stat) is a useful alternative if there is no history of interstate or overseas travel in the last 3 months. Amoxycillin (3 grams) with probenecid (1 gram) is no longer considered effective therapy for infections acquired in the metropolitan area. Treatment options for infections acquired in remote or rural Australia should be discussed with a consultant sexual health physician or infectious disease physician.

It is recommended that patients be re-tested for gonorrhoea five to ten days after antibiotic treatment to ensure that the medication has been effective. The STD Services publication "Diagnosis and Management of STDs", fifth edition, 2000 contains more detailed information on management and treatment of gonorrhoea and is available on the STD services website, or, directly from STD Services.^{4,5}

Acknowledgments

STD Services would like to thank the IMVS, in particular, Lance Mickan and Rachael Pratt, for providing the antibiotic sensitivity results for South Australian cases of gonorrhoea.

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HIV INFECTION IN SOUTH AUSTRALIA

HIV Infection 1985 - 30/06/00

There have been 748 individuals diagnosed with HIV infection, 686 (92%) males and 62 (8%) females. Of the males 521 (76%) reported male-to-male sexual contact, 55 (8%) reported injecting drug use and 29 (4%) reported both risk factors. Heterosexual transmission was reported by 33 (53%) females and injecting drug use was reported by 23 (37%) females diagnosed with HIV infection (Table 1.1).

HIV Infection 01/04/00 - 30/06/00

Two males were diagnosed with HIV infection during the second quarter (Table 1.2).

Laboratory Screening For HIV Infection 01/04/00 - 30/06/00

During the second quarter of 2000, 19199 screening tests have been performed, 8890 (46%) on males, 10281(53%) on females and 28 tests on individuals whose sex was unknown (Table 1.4).

**Table 1.1 HIV infection detected in South Australia, 1985 - 30/06/2000.
Exposure category by sex.**

Exposure category	Male		Female		Total	
	No.	%	No.	%	No.	%
Homosexual contact	521	76	na		521	70
Homosexual contact/IDU	29	4	na		29	4
Heterosexual contact	41	6	33	53	74	10
IDU	55	8	23	37	78	10
Blood products	7	1	2	3	9	1
Other	4	1	3	5	7	1
Unknown	29	4	1	2	30	4
Total	686		62		748	

na not applicable

Table 1.2 HIV infection detected in South Australia, 01/04/00 - 30/06/00 and year to date. Exposure category by sex.

Exposure category	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00	
	Male		Male	
Homosexual	-		5	
Homosexual/IDU	1		1	
Heterosexual contact	1		2	
Unknown	-		1	
Total	2		9	

Table 1.3 HIV infection detected in South Australia, 01/04/00 - 30/06/00 and year to date. Testing history by age at diagnosis.

Testing history	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Age group (years)		Age group (years)		
	<25	25 - 39	<25	25 - 39	40
No previous test	-	-	-	1	1
Negative <12 months	-	-	1	2	-
Negative >12 months	1	1	1	1	1
Known positive overseas	-	-	-	1	-
Total	1	1	2	5	2

Table 1.4 Summary of HIV antibody tests, 01/04/00 - 30/06/00 and year to date. Laboratory by sex.

Laboratory	2nd Quarter 01/04/00 - 30/06/00			Year to date 01/01/00 - 30/06/00			
	Male	Female	Unknown	Male	Female	Unknown	Total
Public	4549	5559	28	9453	11393	116	20962
Private	4341	4722	-	8947	10055	-	19002
Total	8890	10281	28	18400	21448	116	39964

HEPATITIS C SURVEILLANCE IN SOUTH AUSTRALIA

Hepatitis C Medical Notification 01/04/00 - 30/06/00

In the second quarter of 2000, medical notifications of hepatitis C infection were received for 282 individuals, 182 (65%) males and 100 (35%) females.

Among the 282 notifications, 45 cases were reported as having an earlier positive test (pre-1995), whilst 95 individuals had never been tested before for hepatitis C. In a further 100 cases the testing history was unknown. Of 42 individuals with a previous negative test, 26 were tested more than 12 months earlier and 16 were tested within the last year. In 173 (73%) instances, past or present injecting drug use was reported as a likely transmission route for hepatitis C virus (Table 2.1).

At the time of diagnosis, the majority of individuals were aged between 20 and 39 years, 103 (67%) males and 49 (60%) females (Table 2.2). Of eight males and eight females aged less than twenty years (16 cases), 15 had a history of injecting drug use.

Newly acquired infections - Incident Cases

Incident cases are infections acquired in the last 12 months, and are identified by recent seroconversion for hepatitis C antibodies or a positive test accompanied by acute clinical illness not ascribed to other causes.

Sixteen incident cases were identified during the quarter, all had negative serology in the preceding 12 months. The incident cases comprised nine males and seven females. In all cases the likely mode of transmission for hepatitis C virus was injecting drug use (Table 2.3). At the time of diagnosis most were aged 20 to 29 years (Table 2.4).

Collated laboratory data for hepatitis C antibody tests performed during the quarter are shown in Table 2.5.

Table 2.1 Hepatitis C infection, 01/04/00 - 30/06/00 and year to date. Exposure category by sex.

Exposure category	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
IDU*	117	56	253	125	378
Blood transfusion/ products	5	11	11	26	37
Tattoos	9	1	16	6	22
Other**	10	4	22	12	34
High prevalence country***	2	4	10	9	19
Unknown	12	6	21	13	34
Total	155	82	333	191	524

* Includes IDU in combination with other categories.

** Residence/medical treatment in a high prevalence country.

*** Includes possible occupational exposure; household, perinatal & sexual transmission; body piercing/acupuncture.

Table 2.2 Hepatitis C infection, 01/04/00 - 30/06/00 and year to date. Age group by sex.

Age group (years)	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
10 - 19	8	8	12	27	39
20 - 29	51	30	106	63	169
30 - 39	52	19	115	51	166
40 - 49	30	11	70	22	92
≥ 50	14	14	30	28	58
Total	155	82	333	191	524

Table 2.3 Newly acquired infections (Incident cases*) of hepatitis C infection, 01/04/00 - 30/06/00 and year to date. Exposure category by sex.

Exposure category	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
IDU	9	7	22	19	41
Sex partner positive	-	-	1	-	1
Not identified	-	-	1	2	3
Total	9	7	24	21	45

* Incident cases are newly acquired infections, see text.

Table 2.4 Newly acquired infections (Incident cases*) of hepatitis C infection, 01/04/00 - 30/06/00 and year to date. Age group by sex.

Age group (years)	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
15 - 19	2	1	3	5	8
20 - 29	7	5	17	12	29
30 - 39	-	1	4	3	7
≥ 40	-	-	-	1	1
Total	9	7	24	21	45

* Incident cases are newly acquired infections, see text.

Table 2.5 Summary of laboratory tests for hepatitis C antibodies, 01/04/00 - 30/06/00 and year to date. Laboratory by sex.

Laboratory	2nd Quarter 01/04/00 - 30/06/00			Year to date 01/01/00 - 30/06/00			
	Male	Female	Unknown	Male	Female	Unknown	Total
Public	4949	5446	10	10146	11056	80	21282
Private	3834	3444	-	7972	7428	-	15400
Total	8783	8890	10	18118	18484	80	36682

HEPATITIS B SURVEILLANCE IN SOUTH AUSTRALIA

Hepatitis B Medical Notification 01/04/00 - 30/06/00

During the second quarter of 2000, 80 hepatitis B medical notifications were received. Of these, nine were acute clinical cases of hepatitis B infection (Tables 3.1, 3.2). A further 13 were reports of chronic carriers of greater than twelve months duration, who had been previously diagnosed, but not notified (Table 3.3). Reports of antigen positivity of uncertain duration accounted for 58 cases (Table 3.3).

Exposure categories identified for the nine acute clinical cases were injecting drug use (4), injecting drug use and tattoos (1), overseas travel (1) and unknown risk factors (3) (Table 3.1).

Of the 58 reports of antigen positivity of uncertain duration, 34 tested surface antigen positive for the first time this quarter and the testing history was unknown for the remaining 24 cases. Among the 34 individuals who tested surface antigen positive for the first time, but were not acute cases, the racial origin of 19 (56%) was reported as Asian (Table 3.4).

The number of hepatitis B surface antigen tests performed by laboratories for this quarter is shown in Table 3.5.

Table 3.1 Acute hepatitis B infection, 01/04/00 - 30/06/00 and year to date. Exposure category by sex.

Exposure category	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
IDU	2	2	2	2	4
IDU/tattoos	-	1	-	1	1
Overseas travel	-	1	1	1	2
None identified	3	-	3	-	3
Total	5	4	6	4	10

Table 3.2 Acute hepatitis B infection, 01/04/00 - 30/06/00 and year to date. Age group by sex.

Age group (years)	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
10 - 19	-	1	-	1	1
20 - 29	1	1	2	1	3
30 - 39	1	1	1	1	2
40 - 49	1	-	1	-	1
≥ 50	2	1	2	1	3
Total	5	4	6	4	10

Table 3.3 Hepatitis B infection, 01/04/00 - 30/06/00 and year to date. Case category by sex.

Case category	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
Acute Infection	5	4	6	4	10
Antigen positive - uncertain duration	35	23	56	45	101
Chronic carriers - >12 months duration	7	6	13	10	23
Total	47	33	75	59	134

Table 3.4 Individuals who tested hepatitis B surface antigen positive for the first time, 01/04/00 - 30/06/00 and year to date. Race by sex.

Racial origin	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
Aboriginal	2	-	2	2	4
Asian	9	10	16	17	33
Caucasian	8	2	13	3	16
Other/Unknown	3	-	3	1	4
Total	22	12	34	23	57

Table 3.5 Summary of hepatitis B surface antigen tests, 01/04/00 - 30/06/00 and year to date. Laboratory by sex.

Laboratory	2nd Quarter 01/04/00 - 30/06/00			Cumulative 01/01/00 - 30/06/00			
	Male	Female	Unknown	Male	Female	Unknown	Total
Public	4720	6657	20	9671	13653	116	23440
Private	4026	5068	-	8566	11047	-	19613
Total	8746	11725	20	18237	24700	116	43053

GENITAL CHLAMYDIAL INFECTION IN SOUTH AUSTRALIA

Genital Chlamydial Infection 01/01/00 - 30/06/00

In the first half of 2000, 490 medical notifications of genital chlamydial infection were received (Table 4.1). Of these, 210 (43%) cases occurred in males and 280 (57%) in females. These data are consistent with the expected incidence and sex ratio based on data for the period 1995 - 1999.

Genital Chlamydial Infection 01/04/00 - 30/06/00

During the second quarter, 229 cases of genital chlamydial infection were notified. No increase in the South Australian incidence of cases was observed for this quarter. An increase in notifications from Nganampa Health Council, as the result of the annual screening program in the Anangu/Pitjantjatjara lands during April and May, was offset by a fall in the number of notifications from metropolitan General Practitioners during this period.

Of the 229 cases of genital chlamydia, 95 (41%) were diagnosed in males and 134 (59%) in females (Table 4.1). Sixty six cases in males (69%) and 110 cases in females (82%) occurred in persons aged less than thirty years (Table 4.1).

The racial origin was reported as Caucasian for 144 (63%) cases and Aboriginal for 52 (23%) cases (Table 4.2). The infection was reported as being acquired in South Australia for 191 (83%) cases. Two cases reported male-to-male sex.

Laboratory tests for genital chlamydia performed during this quarter are detailed in Table 4.3.

Table 4.1 Genital chlamydial infection in South Australia, 01/04/00 - 30/06/00 and year to date. Age group by sex.

Age group (years)	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
< 20	13	35	21	85	106
20 - 24	26	49	67	106	173
25 - 29	27	26	52	48	100
30 - 34	13	15	32	23	55
35 - 39	8	6	15	11	26
≥ 40	8	3	23	7	30
Total	95	134	210	280	490

**Table 4.2 Genital chlamydial infection, 01/04/00 - 30/06/00 and year to date.
Race by sex.**

Racial origin	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
Aboriginal	18	34	36	61	97
Asian	5	10	13	19	32
Caucasian	63	81	142	190	332
Other/unknown	9	9	19	10	29
Total	95	134	210	280	490

**Table 4.3 Summary of laboratory tests for genital chlamydia,
01/04/00 - 30/06/00 and year to date. Laboratory by sex.**

Laboratory	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
Public	1240	3325	2561	6911	9472
Private	629	1957	1238	4133	5371
Total	1869	5282	3799	11044	14843

GONOCOCCAL INFECTION IN SOUTH AUSTRALIA

Gonococcal Infection 01/01/00 - 30/06/00

In the first half of 2000, 162 cases of gonococcal infection were notified by medical practitioners (Table 5.1). Of these, 106 (65%) cases occurred in males and 56 (35%) in females.

Gonococcal Infection 01/04/00 - 30/06/00

During the second quarter, 85 cases of gonorrhoea were reported to STD Services. This compares with a range of between 46 and 91 infections per quarter notified during 1999.

Fifty seven (67%) cases of gonococcal infection were detected in males, and 28 (33%) in females (Table 5.1).

In females, 75% of infections occurred in those under twenty five years. In males, infection was more evenly distributed across age groups with the majority in the 20-29 group for this quarter (Table 5.1).

The proportion of males with gonococcal infection reporting male-to-male sexual contact was 35%. In both males and females, the majority of infections were acquired in South Australia (89%). The racial origin was reported as Aboriginal for fifty four cases (64%) and Caucasian for twenty eight cases (33%).

Table 5.1 Gonococcal infection detected in South Australia, 01/04/00 - 30/06/00 and year to date. Age group by sex.

Age group (years)	2nd Quarter 01/04/00 - 30/06/00		Year to date 01/01/00 - 30/06/00		
	Male	Female	Male	Female	Total
< 20	11	11	21	23	44
20 - 24	15	10	23	16	39
25 - 29	11	3	23	6	29
30 - 34	6	2	11	5	16
35 - 39	5	1	7	1	8
≥ 40	9	1	21	5	26
Total	57	28	106	56	162

Table 6.2 Males diagnosed with chlamydia, gonorrhoea or syphilis at C275, 01/04/00 - 30/06/00. Exposure category by infection.

Exposure category	No.	Chlamydia	Gonorrhoea	Syphilis
Homosexual	12	-	8	1
	0			
Homosexual, IDU	11	-	1	-
Bisexual	41	-	1	-
Bisexual, IDU	4	-	1	-
Heterosexual, IDU	93	3	-	-
Heterosexual, O/S [#]	67	6	1	-
Heterosexual	43	9	-	-
	8			
Total		18	12	1

Overseas contact in the previous three months.

Table 6.3 Males diagnosed with hepatitis C, hepatitis B* or HIV* infection at C275, 01/04/00 - 30/06/00. Exposure category by infection.

Exposure category	No.	Hepatitis C	Hepatitis B	Hepatitis B
		New diagnosis	Previous exposure**	Carrier
Homosexual	12	-	7	-
	0			
Bisexual	41	-	1	-
Heterosexual, IDU	93	-	2	1
Heterosexual, O/S [#]	67	-	2	-
Heterosexual	43	1	10	-
	8			
Other/Unknown	22		1	-
Total		1	23	1

* No case of HIV infection or acute hepatitis B diagnosed during the quarter.

** Refers to previous infection, now surface antibody positive.

Overseas contact in the previous three months.

Table 6.4 Females diagnosed with chlamydia, gonorrhoea* or syphilis* at C275, 01/04/00 - 30/06/00. Exposure category by infection.

Exposure category	No.	Chlamydia
Heterosexual, O/S [#]	46	1
Heterosexual	38	12
	4	

Total	13
--------------	----

Overseas contact in the previous three months.

* No case of syphilis or gonorrhoea diagnosed during the quarter.

Table 6.5 Females diagnosed with hepatitis C, hepatitis B* or HIV* infection at C275, 01/04/00 - 30/06/00. Exposure category by infection.

Exposure category	No.	Hepatitis C New diagnosis	Hepatitis B Previous exposure**	Hepatitis B Carrier
Heterosexual, IDU	54	1	2	-
Heterosexual, O/S#	46	-	2	-
Heterosexual	384	-	4	3
Other	34	1	1	-
Total		2	9	3

* No cases of HIV or acute hepatitis B diagnosed during reporting period

** Refers to previous infection, now surface antibody positive

Overseas contact in the previous three months.

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All data in this report are provisional and subject to future revision.