Sexually Transmitted Diseases

in South Australia, 1987-2001

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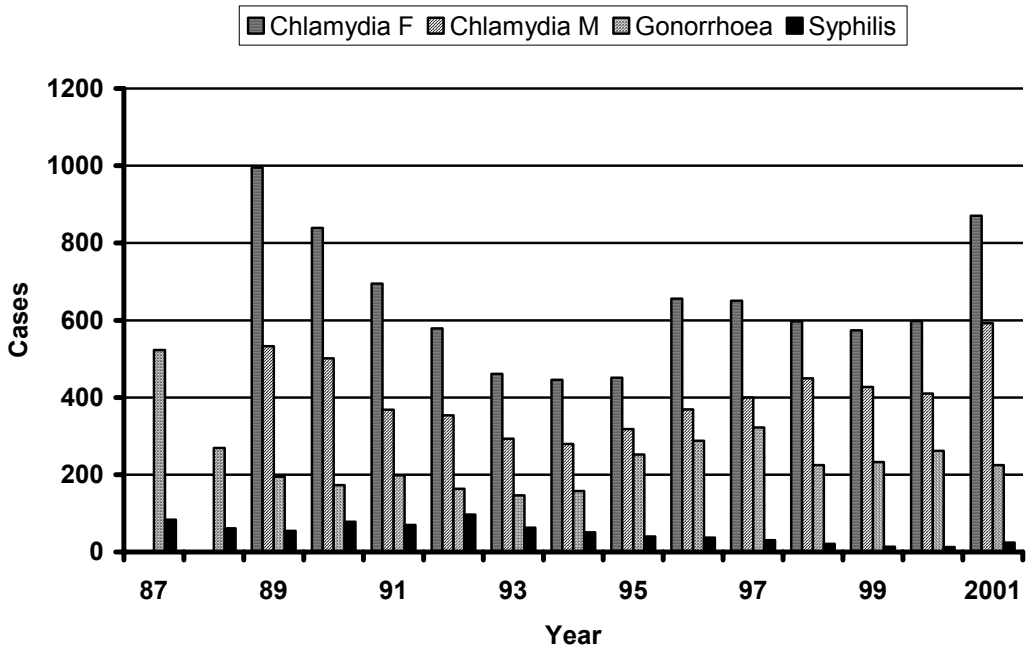
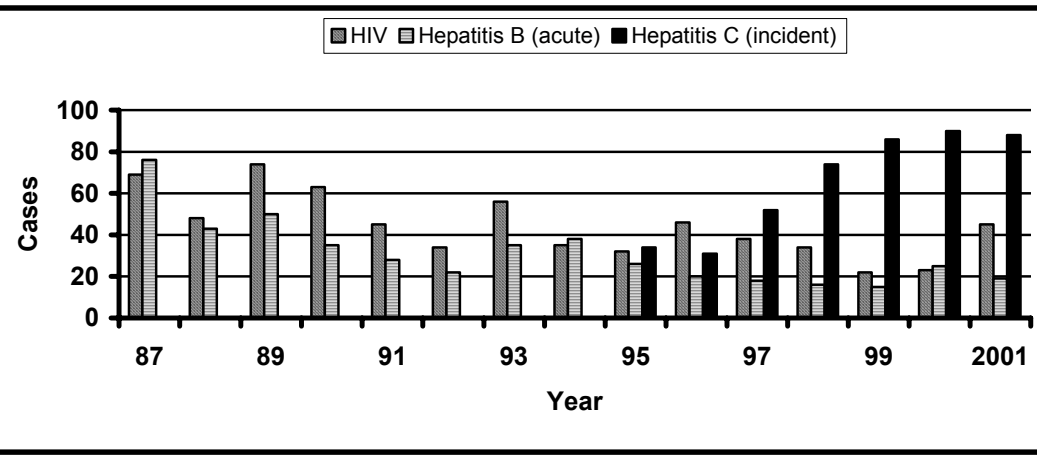
1. Overview

Since 1986 STD Services has consisted of:
Clinic 275 – the central referral facility and only specialised STD clinic in South Australia. Computerised casenotes were fully operational by 1987 (Appendix 1).
Surveillance unit – responsible for maintaining the joint laboratory/medical surveillance system for notifiable STDs in the state. Gonorrhoea and syphilis have been notifiable since 1965; chlamydia was made notifiable in 1989 and HIV infection in 1985. Since 1996 the surveillance unit has operated the surveillance systems for hepatitis B and hepatitis C. Medical notification forms are shown in Appendix 1.

The number of notifiable diseases in South Australia from 1987-2001 is shown in Appendix 2, and population summary of the 1986, 1991 and 1996 census in Appendix 3. Discrepancies in the number of notifiable diseases in different tables (especially for earlier years) result from the inclusion of "laboratory-only" notifications in some tables and the exclusion of such notifications (i.e. only medical notifications) in others. Tabulations excluded cases where the parameter investigated was unknown. Figure 1 summarises the trends of the notifiable STDs in the past 15 years.

Figure 1. Medical notifications of STDs in South Australia, 1987-2001

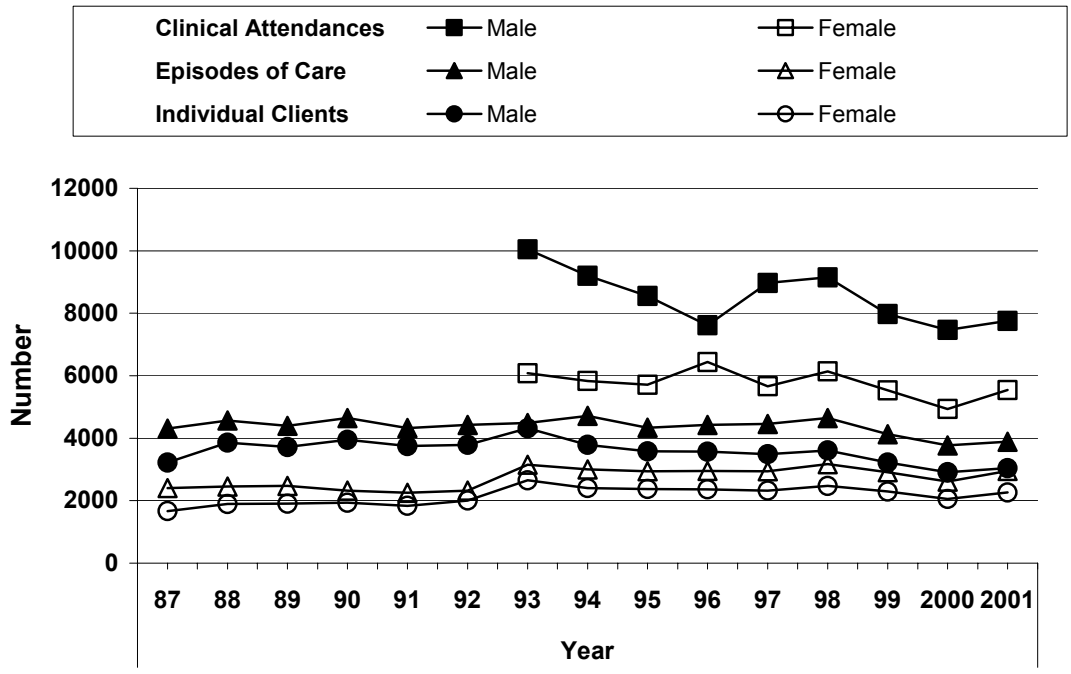




Notifications of chlamydia infections (in both males and females) progressively declined from the commencement of notification in 1989 to the mid-90s, but have slowly increased since 1995. Gonorrhea notifications have remained steady, after a sharp decline in the late 1980s, and syphilis has progressively declined to very low levels. The blood-borne diseases (HIV infection, hepatitis B, hepatitis C)

remained at low levels during the past 15 years, none exceeding 100 cases annually.

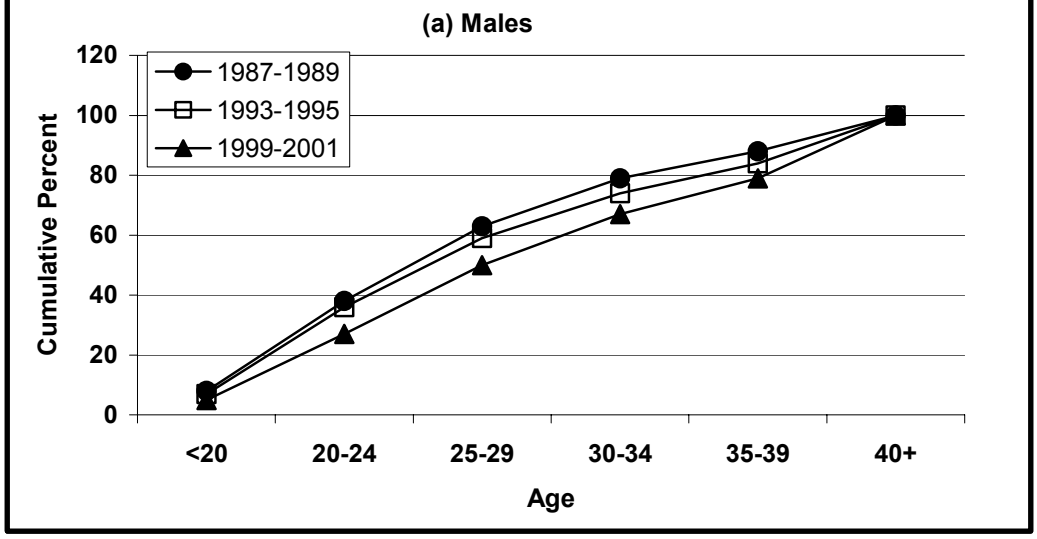
Figure 2. Clients, episodes and attendances at Clinic 275, 1987-2001

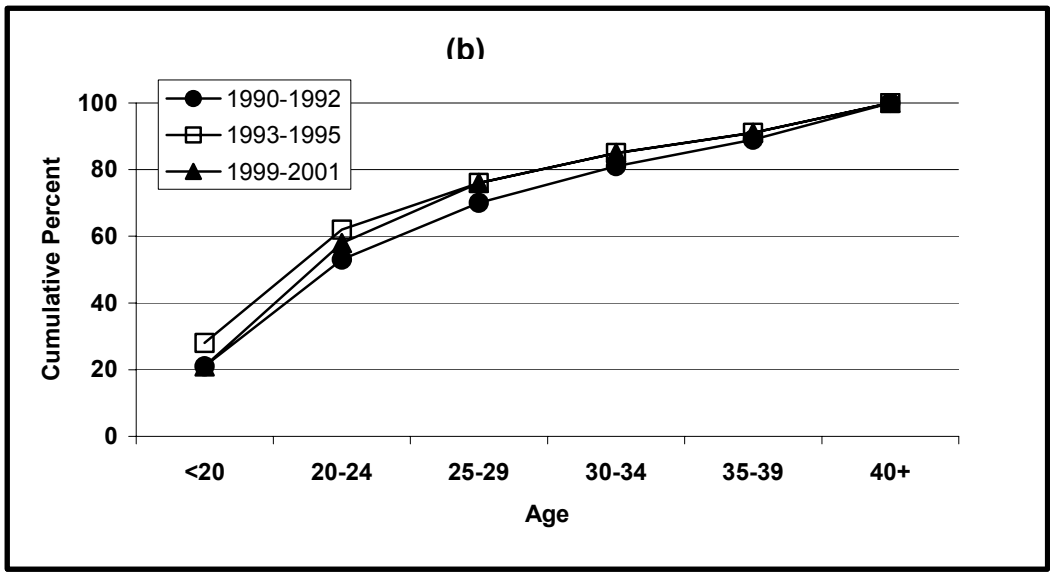


At Clinic 275, from 1987-1992 there were approximately twice as many episodes of care for males as for females. The number of episodes in females increased markedly in 1993 and remained steady until a mild decline occurred in 1999 (Figure 2, Appendix 4).

Clinic attendances, in both males and females, varied much more erratically due to changes in the average attendances per episode, which, for males, declined from a maximum of 2.24 in 1993 to a minimum of 1.72 in 1996 and remained at levels from 1.93 – 2.01 between 1997 and 2001. The reason for this variation is unknown.

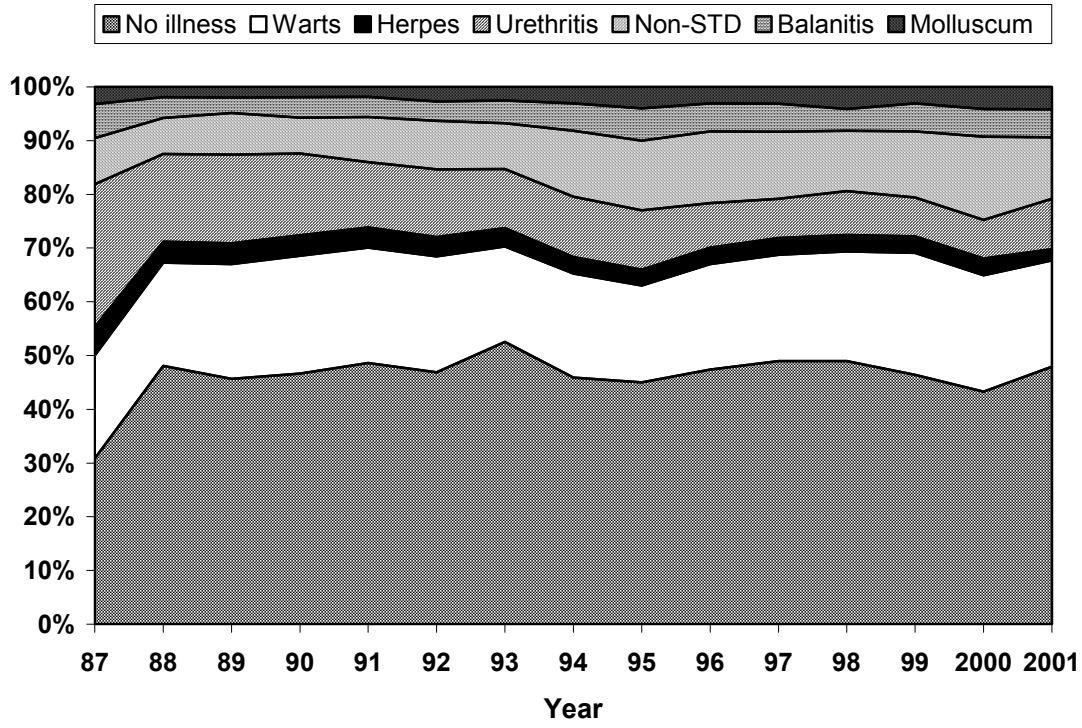
Figure 3. Age distribution (cumulative percent) for episodes of care at Clinic 275, 1987-2001





The average age of male patients increased (shift to right of cumulative frequency graph) and of females decreased (shift to left) over the 15 year period (Figure 3, Appendix 5). Thus for males, 63% were less than 30 in 1987-1989 but only 50% in 1999-2001; whereas for females 70% were less than 30 in 1990-1992 compared with 76% in 1999-2001.

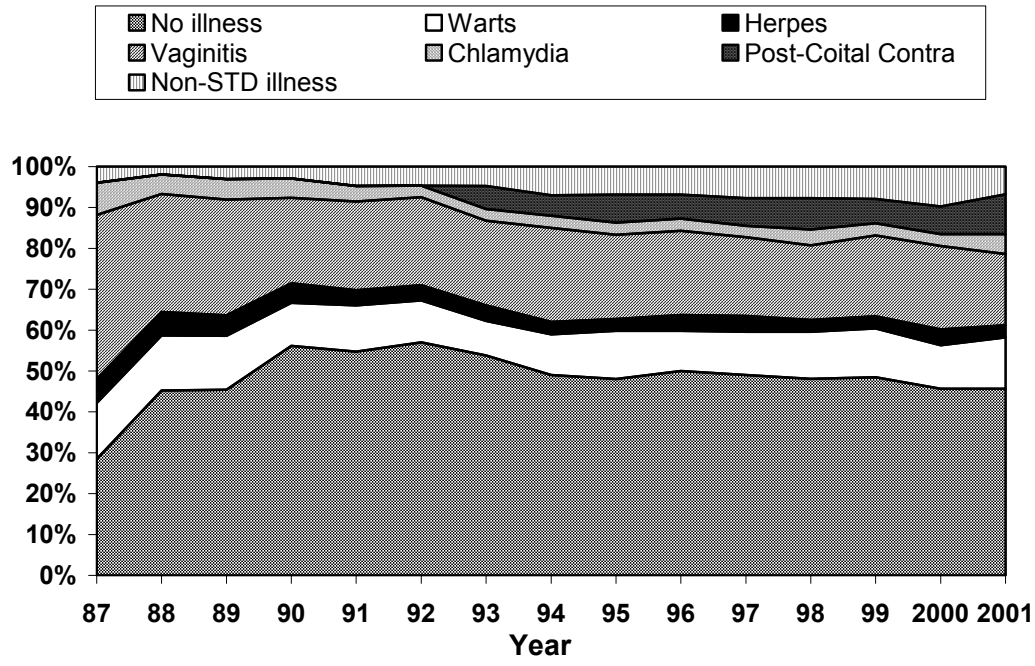
Figure 4. Distribution of major illnesses in males at Clinic 275, 1987-2001



- From 1987 to 1988, the proportion of males with no illness increased from 29% to 50% and reached a peak of 62% in 1993
- The proportion of males with urethritis declined from 25% in 1987 to 9% in 2001
- Non-STD illnesses increased from 8% in 1987 to a maximum of 15% in 2000
- Genital warts was consistently the most common specific diagnosis and contributed from 18% to 24% of all episodes
- There was a decline in the contribution of herpes from 5% of all episodes in 1987 to 2% in 2001

- Molluscum contagiosum increased from 2% of all episodes in the 1980s to 4% in 2001, and balanitis contributed from 3%-6% of episodes over the period

Figure 5. Distribution of major illnesses in females at Clinic 275, 1987-2001

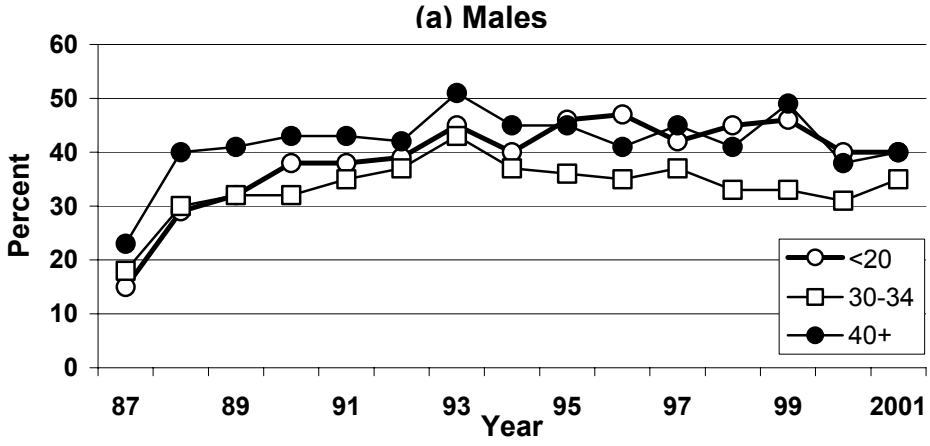


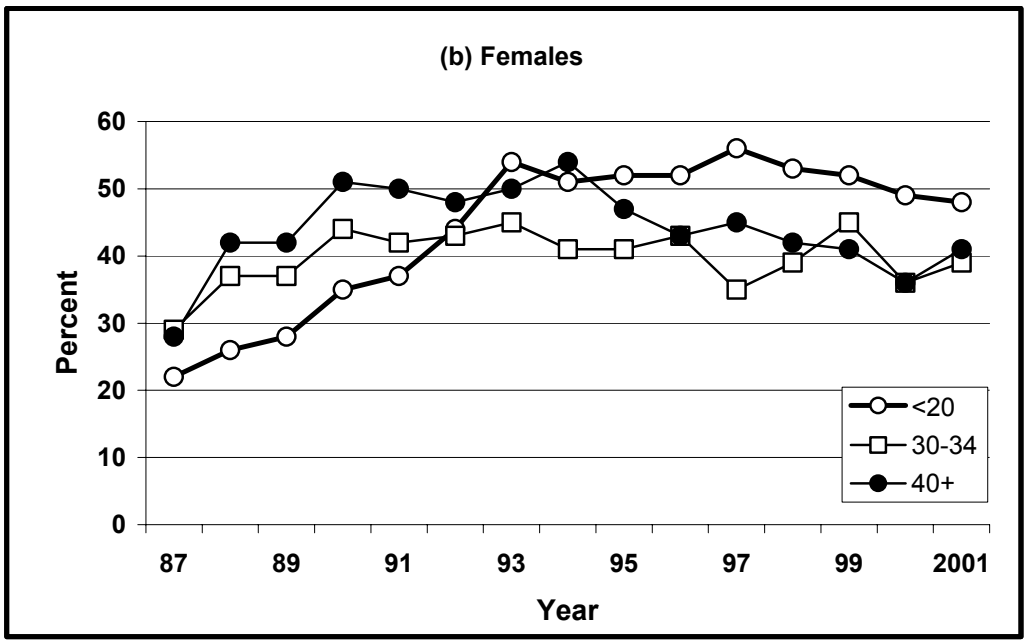
- The proportion of females with no illness increased from 29% in 1987 to 59% in 1990, and declined to about 50% between 1994 and 2001

- The proportion with vaginitis declined from 41% in 1987 to 22% in 1990, and remained at this level until 2001. Part of this decline resulted from a policy of discouraging women at low risk of STDs from using Clinic 275 for regular treatment of their vaginitis

- Genital warts contributed 9-14% of episodes
- Genital herpes declined from 6% in 1987 to 3% in 2001
- Post-coital contraception increased from 6% in 1993 to 10% in 2001
- Non-STD illness increased from 2-4% in the 1980s to 5-9% between 1991 and 2001

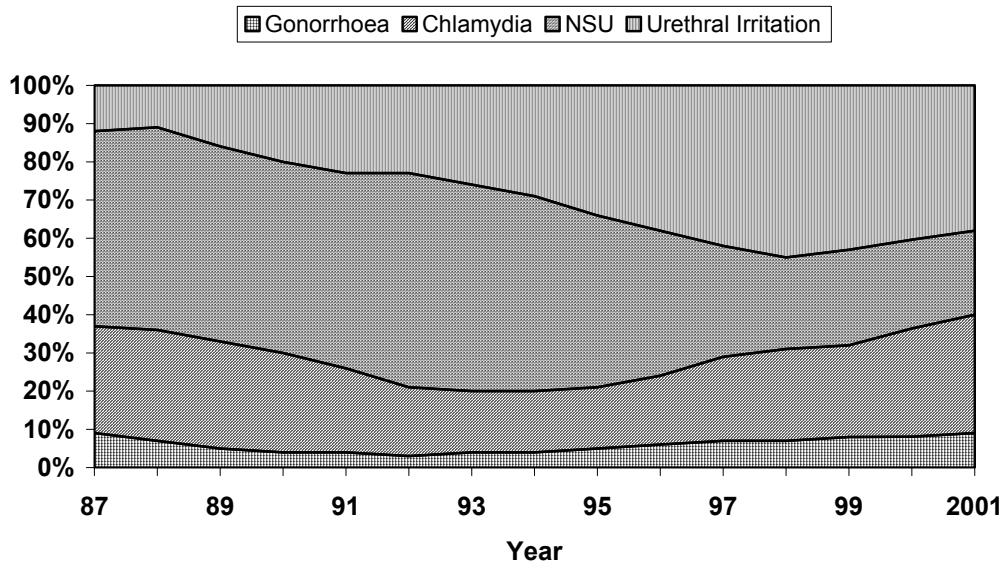
Figure 6. Proportion asymptomatic (%), by age by year, for patients attending Clinic 275, 1987-2001





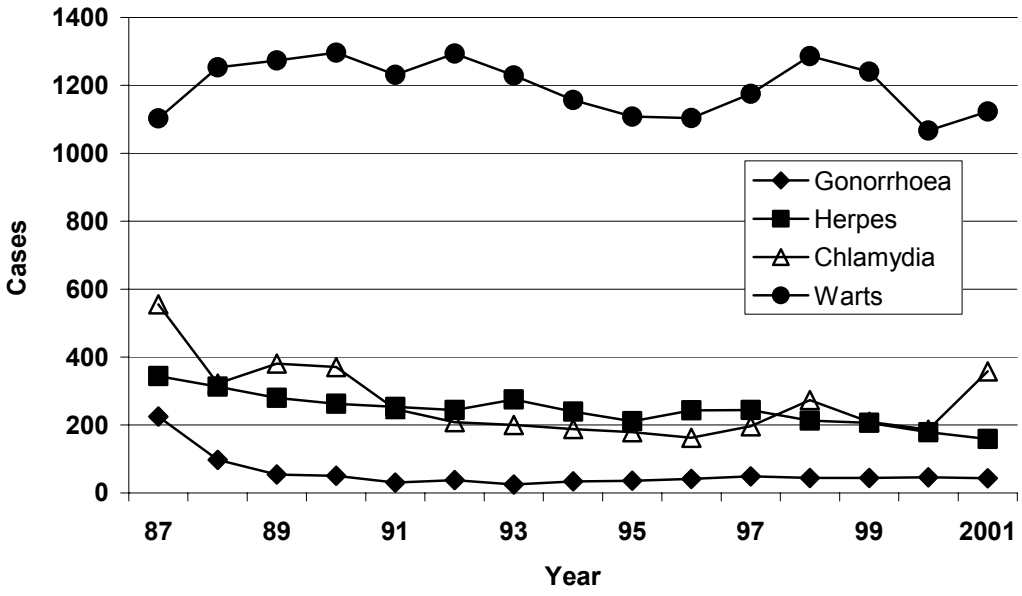
The proportion of patients who were asymptomatic increased markedly from 1987 to 1989 and remained steady thereafter for most groups (Figure 6, Appendix 5). However, for females under 20, the proportion asymptomatic increased from 22% in 1987 to 54% in 1993, and remained near 50% thereafter.

Figure 7. Percentage distribution of causes of urethritis in males attending Clinic 275, 1987-2001 (3 yr moving average)



There was a marked change in the distribution of causes of urethritis mainly due to the shrinking contribution of non-specific urethritis (Figure 7, Appendix 4). Non-specific urethritis accounted for 51% of cases of male urethritis in 1987 and only 22% in 2001. By contrast the contribution of urethral irritation increased from 12% to 38% over the same period. The contribution of chlamydia declined from 28% in 1987 to 16% from 1993 to 1995 and rose to 31% in 2001. Similarly, the contribution of gonorrhoea was 9% in 1987, 4% from 1990 to 1994 and 9% in 2001.

Figure 8. Genital warts, herpes, gonorrhoea and chlamydia cases at Clinic 275, 1987-2001



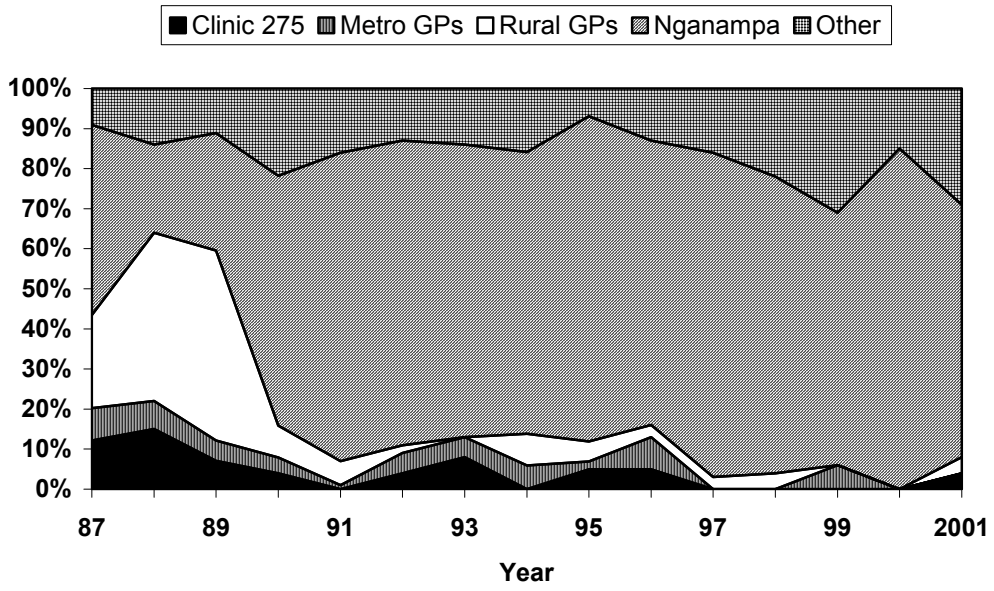
- Genital warts was the most common diagnosis from 1987-2001, total cases varying from 1103 in 1987 to peaks of 1294 in 1992 and 1286 in 1998, and a minimum of 1067 in 2000

- Chlamydia declined from 555 cases in 1987 to a minimum of 162 in 1996 with a resurgence to 358 cases in 2001.

- Genital herpes declined from 344 cases in 1987 to 159 cases in 2001.

- Gonorrhoea declined from 225 cases in 1987 to 43 cases in 2001, with a minimum of 25 cases in 1993.

Figure 9. Notification sources of syphilis in South Australia, 1987-2001



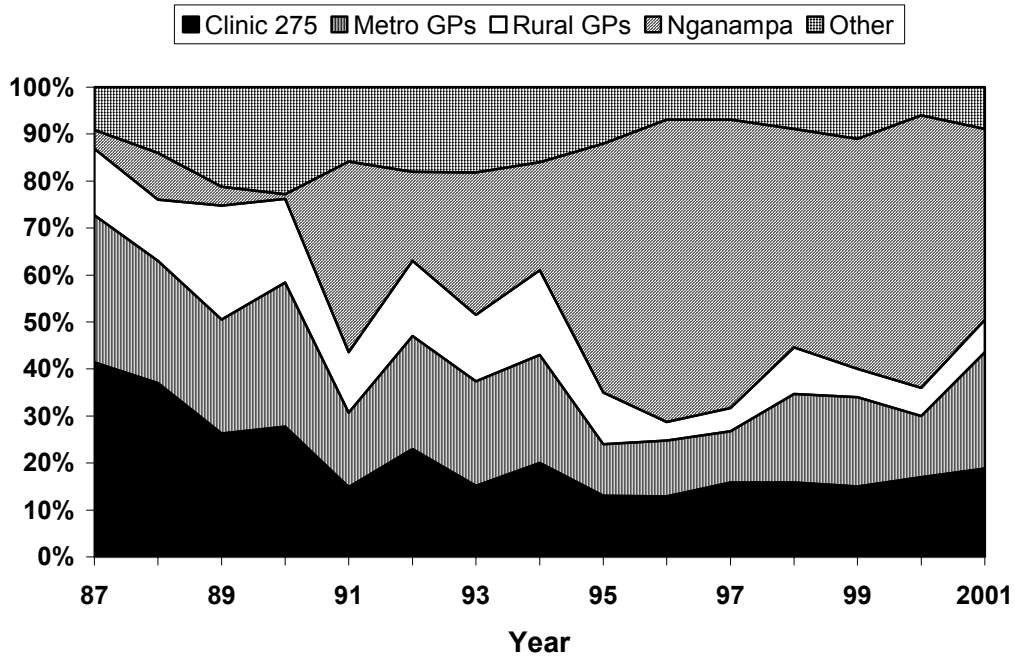
- Syphilis was notified predominantly from Nganampa Health Services covering Aborigines living in North-Western South Australia. The proportion of notifications increased from 47% in 1987 to a peak of 85% in 2000.

- Rural general practitioners notified 42% of cases in 1988 and 47% in 1989 but only 4% in 2001.

- Clinic 275 notified 12% of cases in 1987 and 15% in 1988, but only one case from 1997-2001.

- Other Aboriginal Health Services contributed most of the miscellaneous notifiers who provided about 10% of notifications in 1987-1989 but 29% in 2001.

Figure 10. Notification sources of gonorrhoea in South Australia, 1987-2001



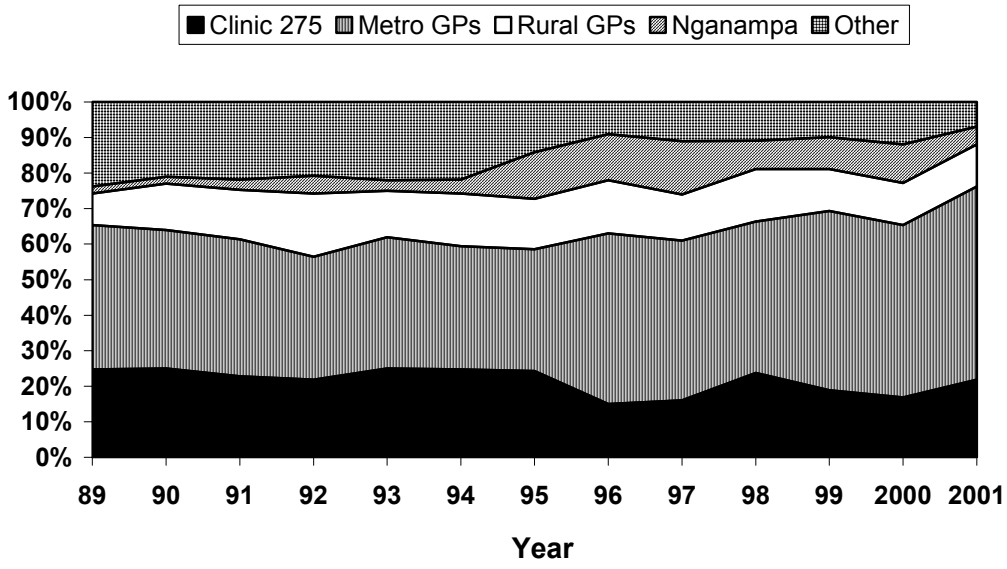
- Nganampa Health Service notified 4% of gonorrhoea cases in 1987 and 65% in 1996, reflecting the increasing proportion of cases occurring in Aborigines.

- The contribution of Clinic 275 declined from 41% in 1987 to 19% in 2001.

- Metropolitan general practitioners notified 24-31% of cases in 1987-1990 and 11-25% of cases from 1995 to 2001.

- Smaller numbers were notified by rural general practitioners, reaching a peak of 24% in 1989, but never exceeding 10% after 1995.

Figure 11. Notification sources of chlamydia in South Australia, 1989-2001



- Metropolitan general practitioners dominated chlamydia notifications, providing 41% of notifications in 1989 and 55% in 2001.
- Clinic 275 notified 22-25% of cases from 1989-1995, with a small decline thereafter.
- Rural general practitioners provided 10-20% over the period.
- Other notifiers - declining from 24% of notifications in 1987 to 7% in 2001 – were mainly public hospitals.

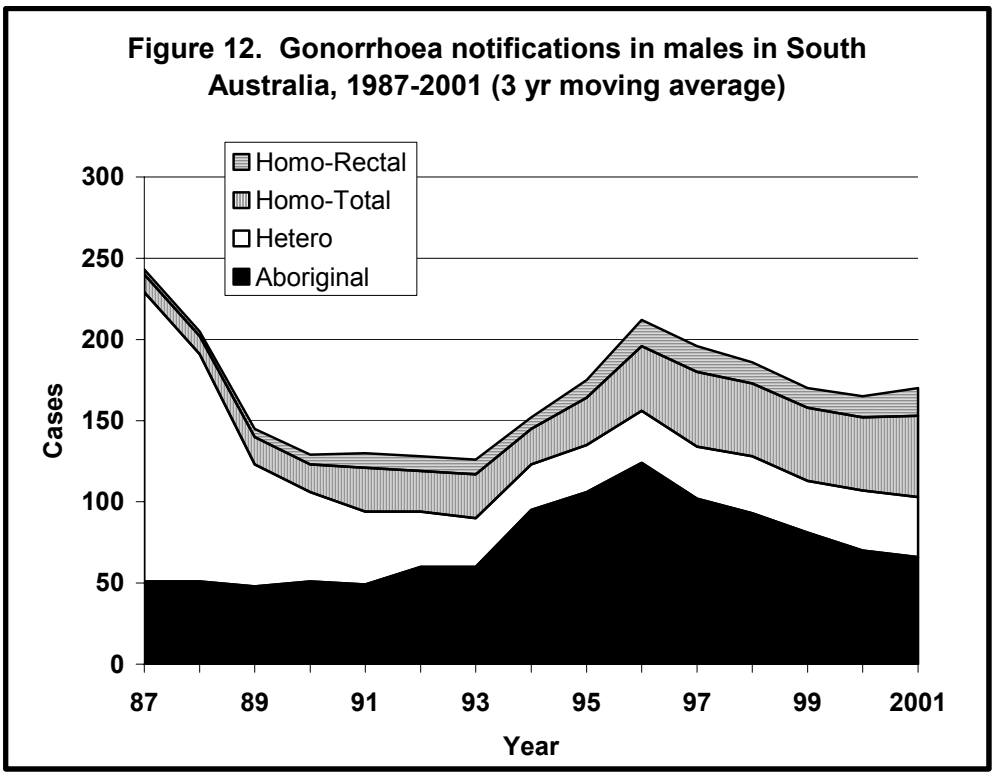
2. Syphilis

Reported cases of syphilis declined from 150 (23/1000,000 population aged 15-49) in 1987 to 24 (4/100,000 15-49 year olds) in 2001 (Appendix 6). Clinic cases declined from 18 in 1987 to seven in 2001 (Appendix 4).
The proportion of cases occurring in Aborigines increased from 91% in 1987 to 100% in 2001. In the past five years (1997-2001) notifications included only one case of syphilis in a non-Aborigine.

3. Gonorrhoea

In South Australia gonorrhoea declined by 62% (226 to 86) in females and 57% (321 to 139) in males from 1987-2001. Clinic cases declined by 81% (225 to 43).
Among females, Aborigines contributed 13% (30/226) of cases in 1987 and 77% (66/86) in 2001. In males the trend was more complex because of the contribution of homosexual non-Aborigines (Figure 12). Among heterosexual males the contribution of Aborigines increased from 15% (45/301) in 1987 to 56% (52/93) in 2001. Over the same period gonorrhoea in homosexual men increased from four (1%) to 46 (33%) cases. The proportion of rectal gonorrhoea in homosexual men was consistently 20-30% except in 1998-1999 when it declined to 16%.

Figure 12. Gonorrhoea notifications in males in South Australia, 1987-2001 (3 yr moving average)

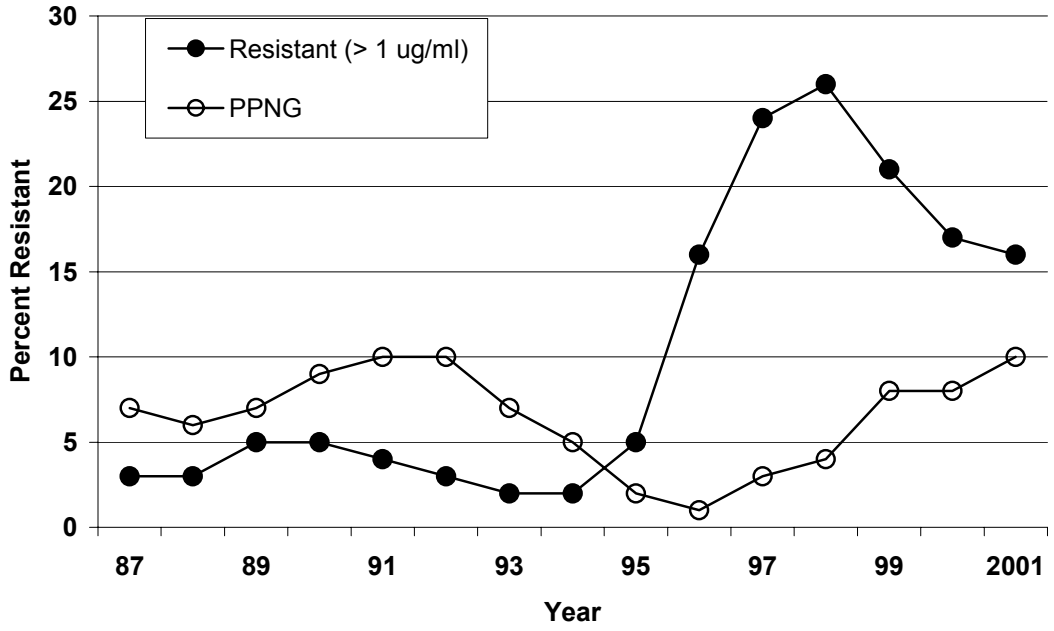


From 1987-2001 about 90% of Aborigines acquired gonorrhoea in South Australia and about 10% interstate (Table 1). However in males the pattern differed markedly for homosexuals and heterosexuals. Among homosexuals 18% acquired gonorrhoea interstate and 3% overseas whereas for heterosexuals the proportions were 9% and 23%, respectively. These patterns did not vary significantly between 1987-2001 (Appendix 8), but in 1990 and 1992 over 40% of cases in heterosexuals were acquired overseas, in 1996 only 46% of heterosexual cases were acquired in South Australia, and in 1994 48% of cases in homosexuals were acquired interstate.

Table 1. Location of acquisition of gonorrhoea for South Australian cases, 1987-2001.

	MALES						**FEMALES**			
Location of Acquisition	**Aboriginal**		**Non-Aboriginal**				**Aboriginal**		**Non-Aboriginal**	
			Heterosexual		**Homosexual**					
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
S.A.	965	89	572	68	351	79	687	90	407	89
Interstate	114	11	73	9	81	18	73	10	22	5
Overseas	1	-	195	23	15	3	-	-	28	6
TOTAL	**1080**		**840**		**447**		**760**		**457**	

Figure 13. Resistance of *Neisseria gonorrhoeae* to penicillin, 1987-2001 (3 yr moving average)



There has been a steady increase in the proportion of resistant gonococcal strains, with over 20% of strains being relatively resistant since 1997. However, the proportion of penicillinase producing strains (PPNG) has remained fairly stable in the past 15 years, varying annually from 1-10% (Figure 13, Appendix 9).

4. Chlamydia

Following commencement of notification in 1989, chlamydia notifications initially declined from 1989 to 1993, then increased from 1995 with a sharp increase in 2001 (Figure 14, Appendix 10). The increased notifications from females can be attributed to increased testing of females by private practitioners. In 1989 the male:female ratio of notifications was 0.53:1 (Appendix 12) and the male:female ratio of tests performed was 0.24:1 (Appendix 11).

From 1989 to 2001 the number of tests on males increased from 6797 to 8892, whereas in females the number decreased from 28267 to 22494, resulting in a male:female ratio for testing of 0.4:1 in 2001. This change in testing pattern probably accounted for the increase in male:female ratio for notifications to 0.68:1 in 2001.

Figure 14. Chlamydia tests (X100) and notifications in South Australia, 1989-2001

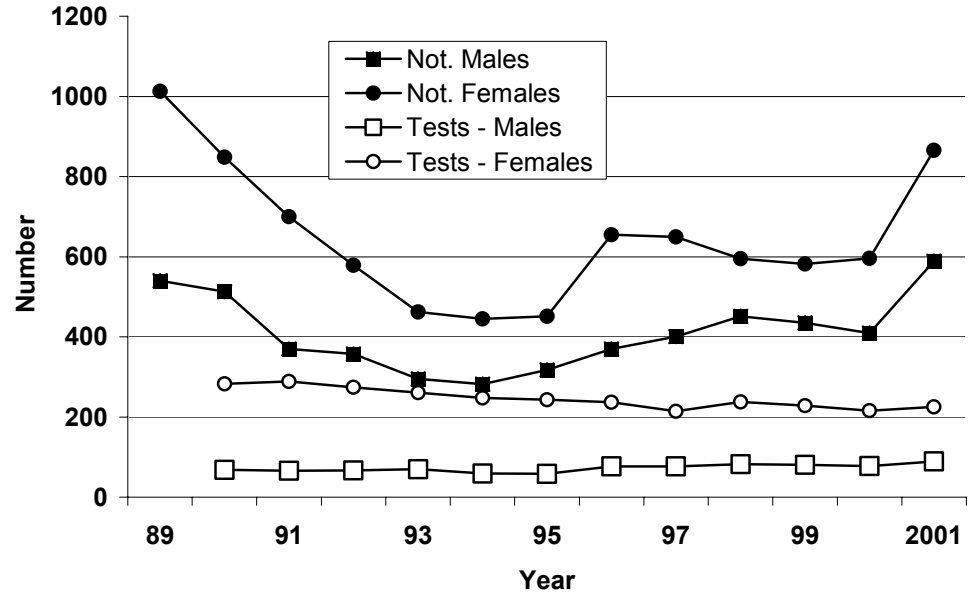
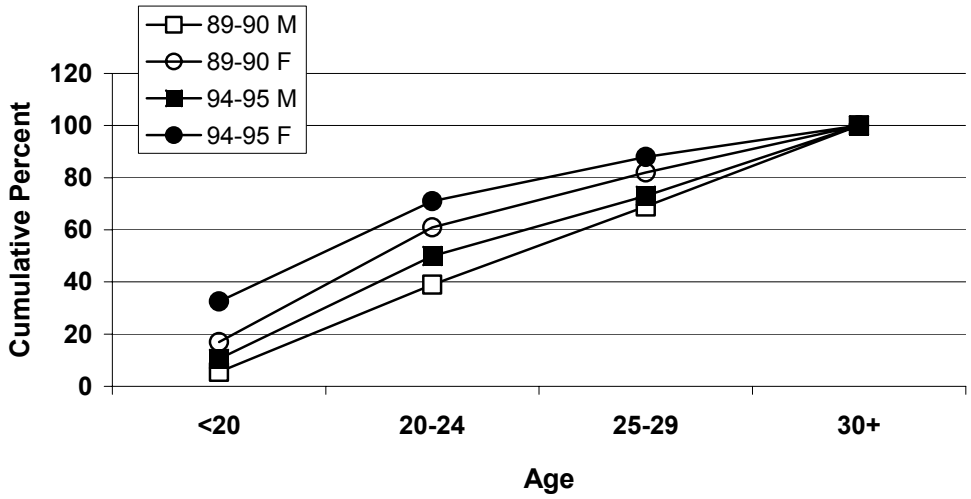
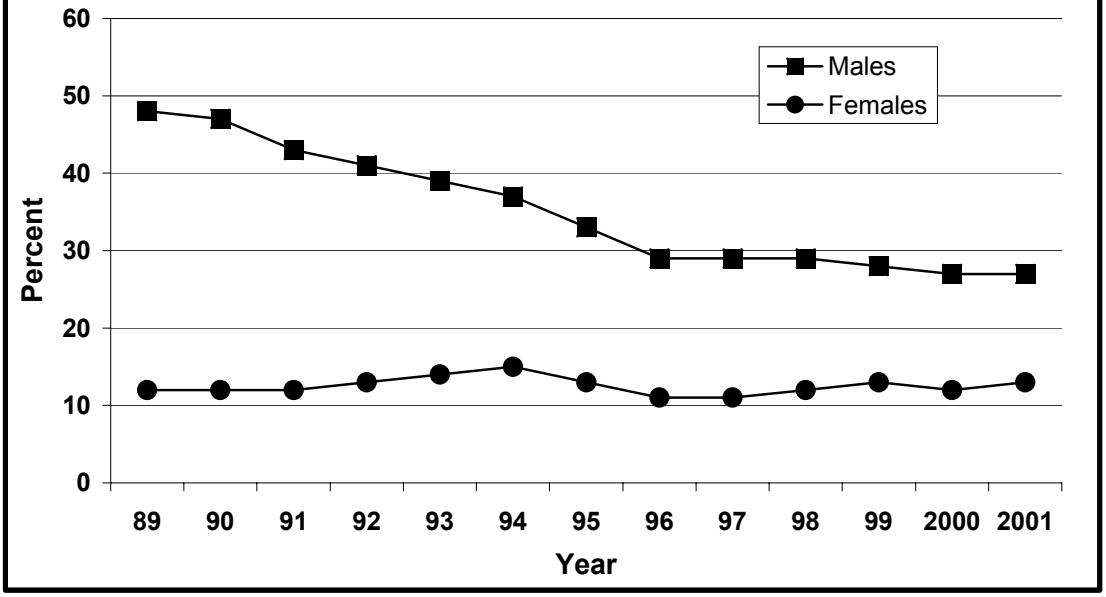


Figure 15. Chlamydia notifications in South Australia, by age and sex, 1989-1990 and 1994-1995



There was a decrease in age of notified chlamydia patients (reflected by a shift to the left of cumulative frequency graph) for both males and females from 1989 to 1995 (Figure 15, Appendix 10). Thus 50% of males were under 25 in 1994-1995 compared with 39% in 1989-1990, and the corresponding proportions for females were 71% and 61%, respectively. This age distribution was maintained in later years with the 2000-2001 age distributions for both males and females being identical to those in 1994-1995.

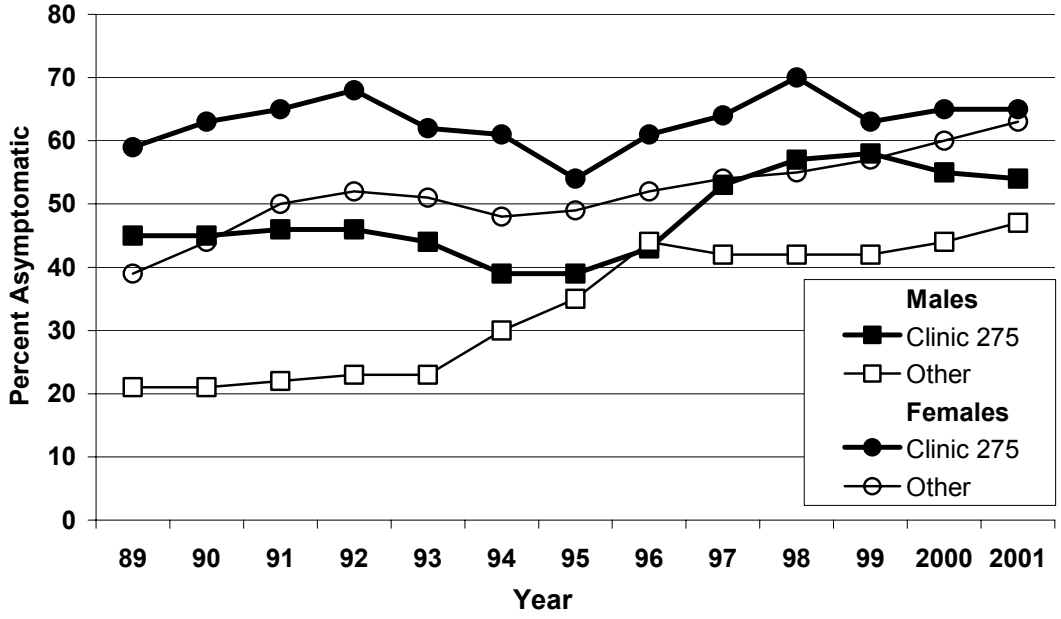
Figure 16. Proportion of South Australian chlamydia detected at Clinic 275, 1989-2001, (3 yr moving average)



For males, the proportion of notified chlamydia detected at Clinic 275 decreased from 48% in 1989 to 27% in 2001, whereas the proportion of females varied from 11-15% between 1989 and 2001 (Figure 16, Appendix12).

The pattern in males was probably a result of increased screening by general practitioners which was facilitated by urine testing in later years. High levels of screening of females by private practitioners has occurred since 1989.

Figure 17. Proportion of asymptomatic chlamydia cases at Clinic 275 and other clinical services in South Australia, 1989-2001 (3 yr moving average)



Almost complete screening of patients attending Clinic 275 provided a high proportion of asymptomatic patients among chlamydia cases (Figure 17, Appendix 12).

Among males with chlamydia detected by private practitioners, only 21-23% were asymptomatic from 1989 to 1993, presumably because males were tested either because of symptoms or contact with a known case. Increased screening by these practitioners detected more infection in asymptomatic males and by 2001, 47% of all cases detected were asymptomatic.

5. HIV Infection

There has been a steady decline in notified HIV infections from 90 in 1985 to a minimum of 22 in 1999 with a subsequent rise to 45 in 2001 (Figure 18, Appendix 2). In most years over 90% of notifications occurred in males, although a minimum of 78% (35/45) occurred in 2001 (Appendix 13). In 1995 97% of infections occurred in males with only one infection detected in a female.

Figure 18. HIV infection detected in South Australia, by sex by year of diagnosis, 1985-2001

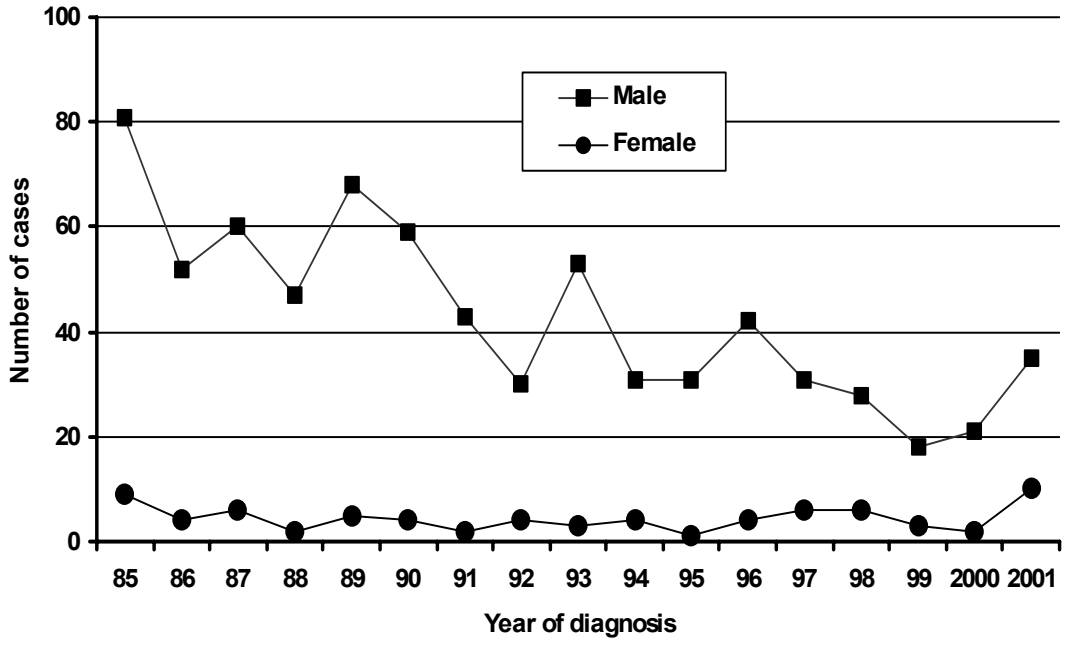


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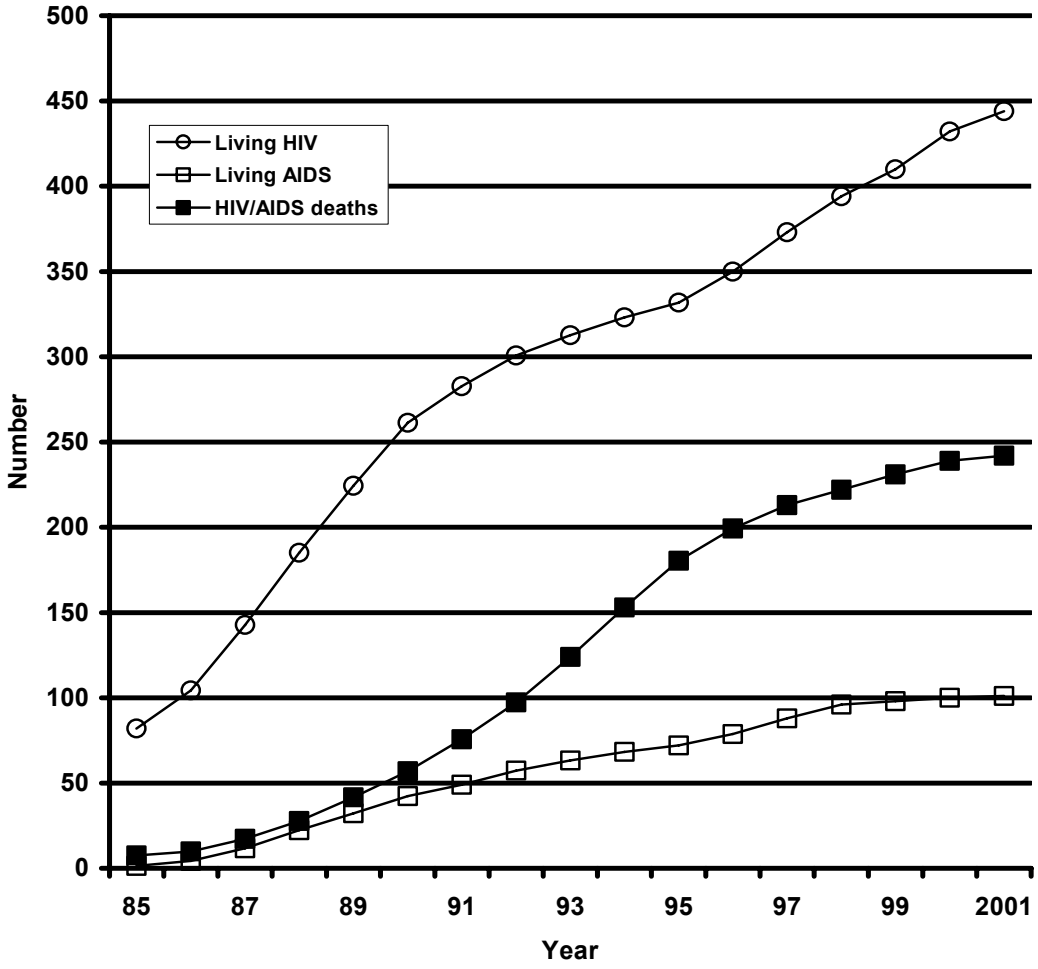
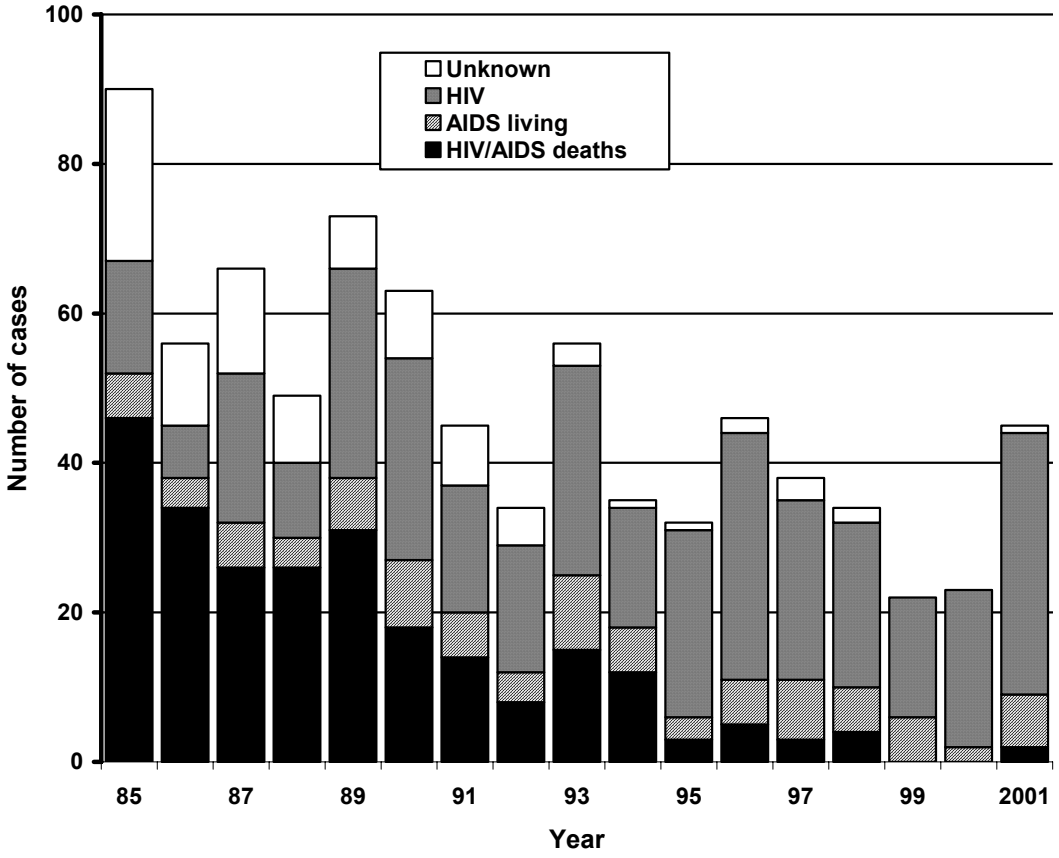
Figure 19. Cumulative HIV/AIDS deaths and individuals living with HIV and AIDS at 31 December each year. (3 yr moving average)



The use of combination anti-retroviral therapy and prophylaxis for AIDS defining conditions delay the onset of AIDS and allow individuals to live longer with HIV infection.

Consequently, the number living with HIV is increasing at a steady rate, whereas those living with AIDS and AIDS deaths have changed little in recent years (Figure 19).

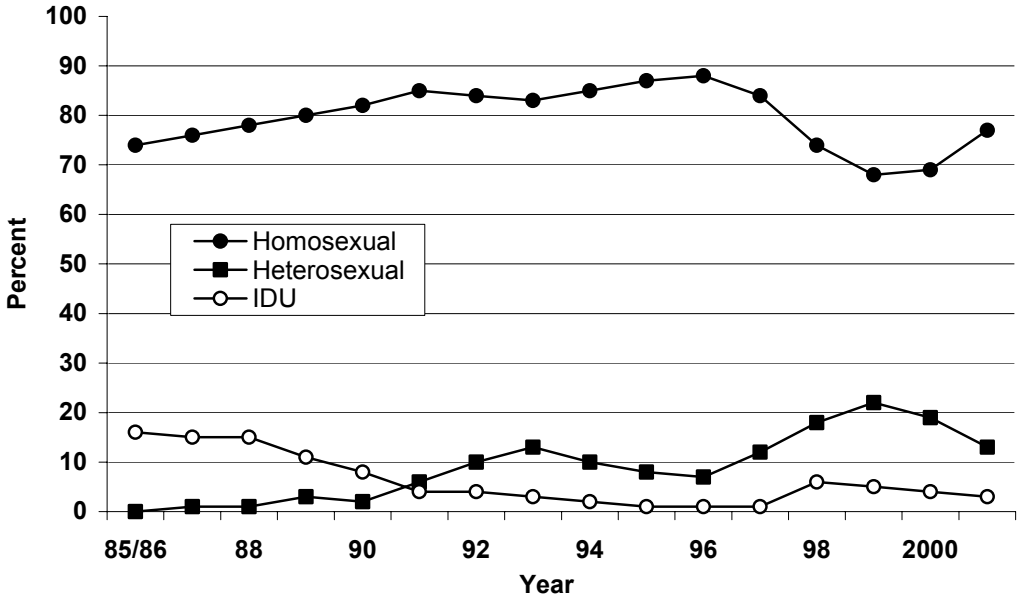
Figure 20. Current status, by year of diagnosis, of individuals diagnosed with HIV infection in South Australia, 1985-2001.



The correlation of time since diagnosis with duration of infection is imprecise, but Figure 20 provides general evidence of variability of outcome among individuals, with substantial numbers surviving more than 17 years. Small numbers continue

to be diagnosed late in the course of disease, with nine cases (20%) in 2001 having AIDS at the time of diagnosis.

Figure 21. HIV infection detected in males in South Australia, by risk factor, 1985-2001 (3 yr moving average)

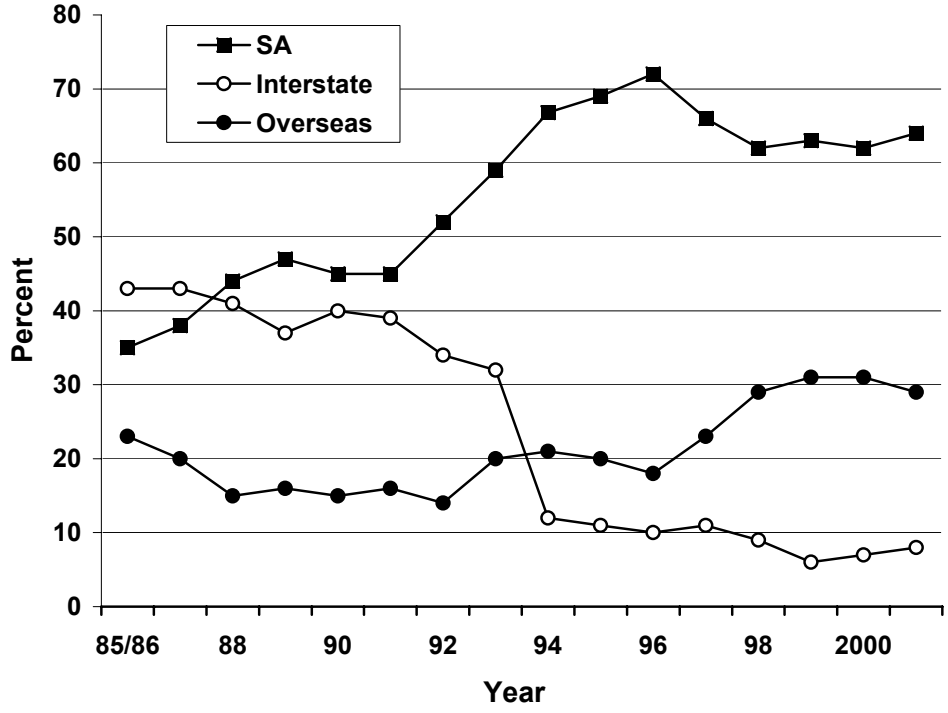


- Homosexual exposure has always posed the greatest risk for HIV infection, with over 80% of infections from 1989 to 1997 being attributed to this risk (Figure 21, Appendix 15).

- The contribution of intravenous drug use has continually declined from 16% in 1985/1986 to 1% by 1997, with a slight increase in recent years.

- Heterosexual cases increased from 1% in the 1980s to a peak of 22% in 1999 (but only representing six cases).

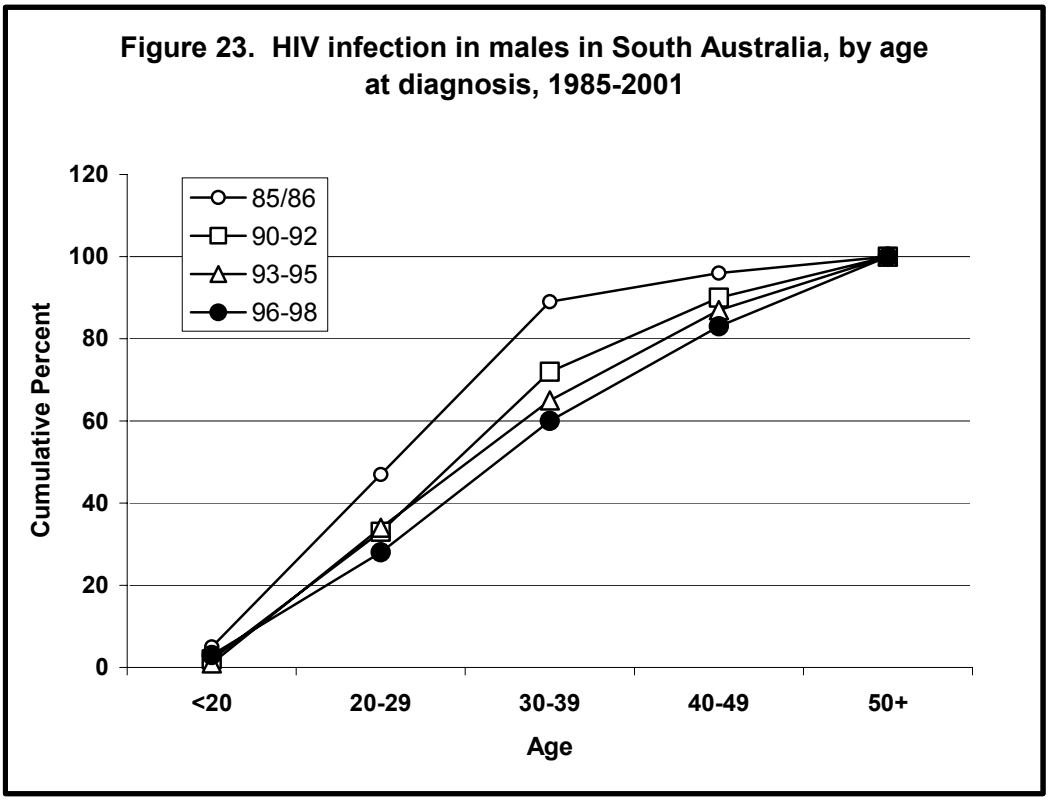
Figure 22. HIV infection in South Australia, by year by likely location of acquisition of infection, 1985-2001. % refers to proportion of known location (3 yr moving average)



- The proportion of HIV infection acquired in South Australia increased from 35% in 1985/1986 to a peak of 72% in 1996 and subsequently remained above 60% (Figure 22, Appendix 16).

- By contrast, infections acquired interstate decreased from 43% in 1985/1986 to less than 10% annually after 1997.

- Overseas infections contributed about 15-20% of cases until 1996 but have increased to about 30% annually since that time.



The age of male HIV patients has increased since 1985/1986 (shift to right of the cumulative frequency graph) (Figure 23, Appendix 17). In 1985/1986, 41% were less than 30, compared with 28% in 1996/1998. In 1985/1986 only 4%, compared with 17% in 1996/1998, were over 50. In 1992 and 1998, 20% and 29%, respectively, were over 50 at the time of diagnosis (Appendix 17).

6. Hepatitis B and Hepatitis C

Notifications of hepatitis C declined from peaks in 1994 (1428 males, 853 females) to much lower levels in 1995 (835 males, 380 females) and have slowly declined since (593 males, 323 females in 2001) (Figure 24, Appendix 18).

The increase in newly acquired infections (from 34 in 1995 to 88 in 2001) reflects increased ability to classify such cases and does NOT indicate increased transmission of infection.

Figure 24. Medical notifications and newly acquired (within 12 months) hepatitis C infections in South Australia, 1993-2001

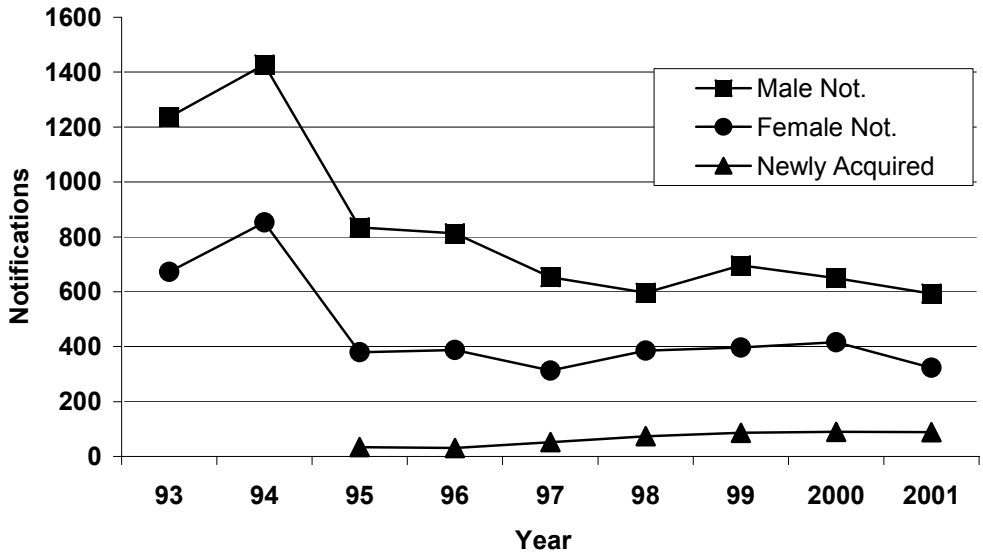
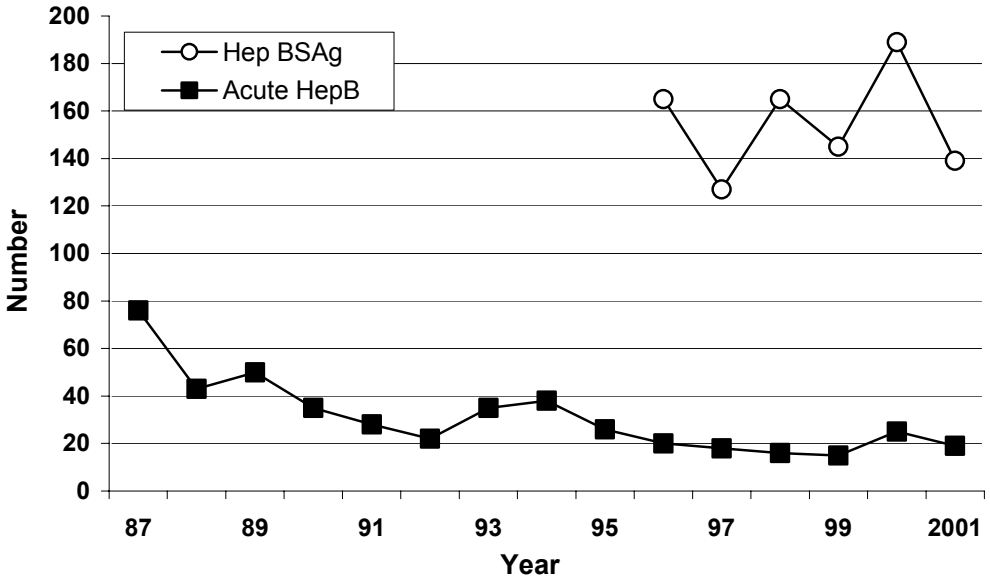


Figure 25. Acute hepatitis B infection and hepatitis B surface antigen positive tests in South Australia

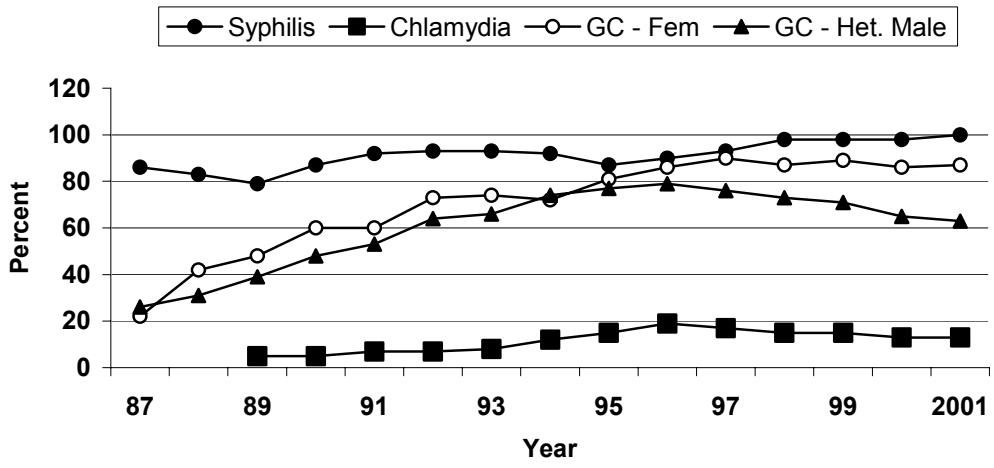


There has been a decline in notified cases of acute hepatitis B from 76 in 1987 to 19 in 2001 (Figure 25, Appendix 20). The oscillation in number of carriers detected probably reflects testing patterns rather than change in prevalence. There have been no changes in the ethnic pattern of carriers since 1996 (Appendix 22), with the proportion of Asians always exceeding 50%, and Aborigines contributing 5-9%. Because of the selective biases in testing, these data cannot be extrapolated to larger population groups.

7. Ethnic Factors

In 1987, for both males and females, Caucasians contributed 97% of Clinic 275 clients with Aborigines, Asians and other races each contributing 1% (Appendix 23). By 2001 the proportion of Caucasians had decreased to 90% for males and 89% for females with an increase of Asians to 4% and other races to 4%. Students from Africa and other countries made a major contribution (about 50%) to the "Other" ethnic group.

Figure 26. Proportion of STDs occurring in Aborigines, by year, 1987-2001



Although Aborigines contribute only about 1% to the total population (Appendix 3), they contribute disproportionately to syphilis, gonorrhoea and chlamydia infections (Figure 26, Appendix 6).

- Syphilis has always been common in Aboriginal populations, and the proportion of notifications increased from 86% in 1987 to 100% by 2001.

- Since the 1980s Aborigines have made an increasing contribution to gonorrhoea. Among females the proportion of Aborigines increased from 22% in 1987 to 87% in 2001. Among heterosexual males the proportion of Aborigines increased from 26% in 1987 to a maximum of 79% in 1996, but has since declined to 63% in 2001. This decline is probably a result of misclassifying some non-Aboriginal males with gonorrhoea as being heterosexual when in fact they were homosexual.

The contribution of Aborigines to chlamydia notifications increased from 5% in 1989 to a peak of 19% in 1996, and has slowly declined to 13% in 2000-2001.