CHAPTER 4
SEXUAL HEALTH

CONTENTS

LIST OF TABLES

LIST OF FIGURES

4. SEXUAL HEALTH

4.1 Sexual behaviour

The legal age for consent to sexual intercourse – 16 years for both males and females – coincides with the age during which adolescents show an acceleration of sexual risk behaviours.[1] There have been two recent surveys on the sexual behaviour and health of adolescent Australians.[2,3] The 1997 survey of Australian secondary students found that 25% of year 10 (15 -16 years) and almost 50% year 12 students (17-18 years) reported having had sexual intercourse. According to this survey, most sexually active students in year 10 and year 12 had only one sexual partner in the previous year.[2] The *National Survey of Australian Secondary Students* (2003) reported that 26% of Year 10 students and 47% of Year 12 students stated that they had experienced sexual intercourse. Both in Years 10 and 12, slightly more males than females reported having had sexual intercourse. Between 1992 and 2002, the proportion of young people in Years 10 and 12 (in government schools) who had had sexual intercourse increased from 35% to 42% (an increase from 23% to 32% among Year 10 students and an increase from 48% to 55% among Year 12 students).

Half of sexually active male students in Years 10 and 12 reported having sexual intercourse with one sexual partner in the previous year, as did 62% of female students. Around 38% of young people in Years 10 and 12 had more that one sexual partner in the previous year. A higher proportion of males in Years 10 and 12 reported having more than one sexual partner during the previous year (41%) compared with females (35%).[3]

The pattern of sexual activity was very different for young offenders. In both survey samples (custody and community), most young offenders reported having had sexual intercourse (vaginal, anal, or oral) at least once in their lifetime [YPoCOHS: (88%; n=692), YPiCHS: 93%; n=192)]. Eighty-three percent (83%) of the community orders sample and 83% of the custody sample had experienced sexual intercourse by the age of 15.

Ten percent (10%, n=79) of the community orders sample reported having had only one sexual partner; 78% (n=532) [YPiCHS: 75%, n=165] indicated that they had had three or more sexual partners (Figure 4.1 and Table 4.2).

Figure 4.1 Lifetime number of sexual partners (including same sex partners) by gender (%)

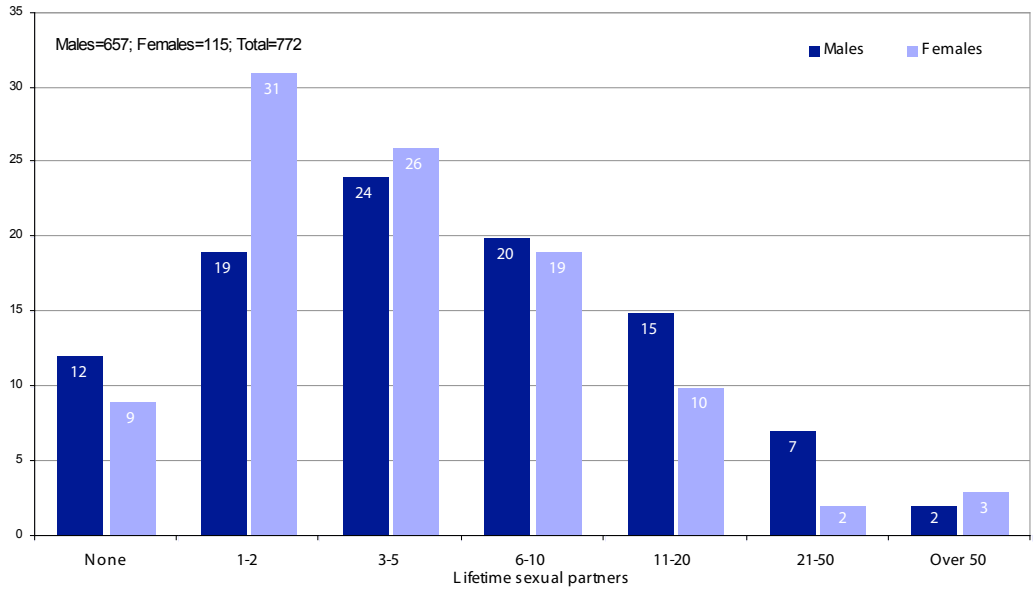


Table 4.1 displays sexual experience history with a partner (including vaginal, oral, anal sex), age at first sexual experience and lifetime sexual partners.

12% young offenders had never experienced sexual intercourse

34% had experienced sexual intercourse by age 13

74% had experienced sexual intercourse by age 15

67% young offenders who had experienced sexual intercourse reported that they had had three or more sexual partners

Table 4.1 Sexual experience history (vaginal, oral, anal sex), age at first sexual experience, and number of sex partners (%)

Sexual experience	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Have you ever had sex[i]						
Yes	88	93	91	94	88	93
Age first had sex[ii]						
<12	5	10	5	0	5	10
12-13	33	40	35	44	33	38
14-15	45	39	42	37	45	35
>15	17	11	18	19	17	10
Number of sex partners[ii]						
1	10	8	19	24	11	9
2	11	10	15	13	11	10
3-5	27	20	29	44	27	22
6-10	24	25	20	13	24	24
11-20	17	19	11	0	17	18
21-50	8	10	2	0	7	9
51-100	2	4	1	6	3	4
>100	<1	4	3	0	<1	4

a (i) Males=670, Females=116, Total=786; (ii) M=579, F=104, T=683; b (i) M=206, F=17, T=223 (i) M=190, F=16, T=206

Of the 88% who had experienced sex

• 38% had experienced sex by age 13, 83% by age 15

• 11% reported having had only one sex partner

Parents can be influential in supporting safe sex practices in their children

Although parents believe that they have little influence over their adolescents' sexual behaviour, a recent study has shown otherwise.[4] It examined the role of parental communication and instruction concerning sexual behaviour in a community-based sample of 1083 youth aged 13–17 years. It found that youth were much less likely to have initiated sexual intercourse if their parents taught them to be assertive in sexual negotiations with partners, set clear rules, talked about responsible sexual behaviour and about delaying sexual activity. If youth were sexually active, they were more likely to use birth control if taught at home about delaying sexual activity and about birth control. Having only one sexual partner was associated with having an adult role model who supported abstinence, being taught at home about birth control, and being taught at home to be assertive in sexual negotiations with partners. If parents reported talking with youth about birth control and sexually transmissible infections (STI) prevention, youth were significantly more likely to use birth control. The authors concluded that parents have the capacity to influence their children's sexual behaviour and sexual decision making.

4.1.1 Vaginal, oral and anal sex

Ompad et al. (2006)[5] surveyed 1,679 adolescents about sexual practices, including vaginal, oral and anal sex. Responses indicated a tendency to engage in oral and anal sex as a means of reducing the risk of STIs and pregnancy.

Adolescents experience a range of social and emotional consequences after having sex. These may be different for males and females. For example, Brady and Halpern-Felsher (2007)[6] examined whether adolescents' initial consequences of sexual activity differed according to type of sexual activity and gender in a sample of 618 school-attending 14 year old adolescents (56% female). Adolescents who engaged in oral sex were less likely to report STIs but females were more likely to feel guilty, bad about themselves and used. Males having oral sex were more likely than females to report feeling good about themselves. These findings have implications for clinical practice and public sexual health campaigns targeted at youth.

Table 4.2 displays age, frequency and number of sexual partners for vaginal sex. The median age of first vaginal sex was 14 years for both males (range: 6 to 18) and females (range: 7 to 17).

Table 4.2 Vaginal sex: Age of first experience, number of times and number of partners (%)

Vaginal sex	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Have you ever had vaginal sex[i]						
Yes	87	91	91	94	88	91
Age first had vaginal sex[ii]						
11 years or less	4	9	4	0	4	9
12 to 13 years	30	39	34	44	31	39
14 years	24	23	22	25	24	23
15 years	23	19	22	12	23	18
16 years or more	19	10	18	19	18	11
Number of times had vaginal sex[ii]						
1	4	1	4	0	4	1
2	4	4	5	7	4	4
3 to 5	12	11	14	20	12	12
6 to 10	14	12	15	13	14	12
11 to 20	16	18	15	33	16	19
21 to 50	16	26	18	13	16	26
51 to 100	13	6	16	7	14	6
Over 100	21	22	13	7	20	20
Number of vaginal sex partners[ii]						
1	12	8	20	25	13	9
2	12	11	16	13	13	11
3 to 5	28	21	28	44	28	23
6 to 10	22	24	21	12	22	23
11 to 20	15	18	9	0	14	17
21 to 50	9	11	2	0	8	10
51 to 100	2	4	1	6	1	5
Over 100	0	3	3	0	1	2

a (i) Males=651, Females=113, Total=764 (ii) M=569-579, F=103-104, T=672-683; b (i) M=206, F=17, T=223 (ii) M=190, F=16, T=206

Table 4.3 (overleaf) displays history, age at first experience, frequency and number of sexual partners for oral sex. The median age of first oral sex was 14 years for both males (range: 6 to 18) and females (range: 7 to 17).

12% young offenders had not experienced vaginal sex

Of the 88% who had experienced vaginal sex

- *82% had experienced vaginal sex by age 15*
- *74% had three or more vaginal sex partners*

Table 4.3 Oral sex: Age of first experience, number of times and number of partners (%)

Oral sex	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Have you ever had oral sex[i]						
Yes	54	53	47	41	53	52
Age first had oral sex[ii]						
11 years or less	5	8	6	0	5	8
12 to 13 years	30	35	45	0	32	33
14 years	18	21	11	43	17	22
15 years	24	21	20	29	24	22
16 years or more	23	15	18	28	22	15
Number of times had oral sex[ii]						
1	3	3	9	14	4	4
2	6	5	11	0	6	5
3 to 5	17	12	31	15	19	12
6 to 10	15	14	17	43	15	15
11 to 20	19	21	13	0	18	20
21 to 50	15	19	13	14	15	19
51 to 100	12	6	6	14	12	6
Over 100	13	20	0	0	11	19
Number of oral sex partners[ii]						
1	13	13	28	57	15	16
2	17	9	24	14	18	9
3 to 5	29	24	31	15	29	23
6 to 10	22	17	6	0	20	16
11 to 20	13	23	9	0	13	22
21 to 50	4	8	2	0	4	8
51 to 100	2	2	0	14	1	3
Over 100	0	4	0	0	0	3

a (i) Males=659, Females=114, Total=773 (ii) M=355-359, F=54-55, T=409-414; b (i) M=194, F=17, T=211 (ii) M=109, F=7, T=116

47% young offenders had never had oral sex

Of the 53% who had experienced oral sex,

- *78% had oral sex by age 15*
- *67% had three or more oral sex partners*

Table 4.4 (overleaf) displays history, age at first experience, frequency and number of sexual partners for anal sex. The median age of first anal sex was 14 years for both males (range: 6 to 18) and females (range: 7 to 17).

Table 4.4 Anal sex: Age of first experience, number of times and number of partners (%)

Anal sex	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Have you ever had anal sex[i]						
Yes	12	10	11	6	12	10
Age first had anal sex[ii]						
11 years or less	1	5	0	0	1	5
12 to 13 years	11	20	17	0	12	19
14 years	9	5	8	0	8	5
15 years	13	20	33	0	16	19
16 years or more	66	50	42	100	63	52
Number of times had anal sex[ii]						
1	36	29	66	100	40	32
2	16	33	17	0	16	32
3 to 5	24	4	17	0	23	4
6 to 10	10	19	0	0	9	18
11 to 20	7	10	0	0	6	9
21 to 50	4	0	0	0	3	0
51 to 100	1	0	0	0	1	0
Over 100	2	5	0	0	2	5
Number of anal sex partners[ii]						
1	55	48	83	100	59	50
2	22	33	17	0	22	32
3 to 5	14	14	0	0	12	14
6 to 10	5	5	0	0	4	4
11 to 20	4	0	0	0	3	0
Over 20	0	0	0	0	0	0

a (i) Males=669, Females=116, Total=785; (ii) M=81-83, F=12, T=93-95; b (i) M=205, F=17, T=222; (ii) M=20, F=1, T=21-22

4.1.2 Sexual orientation

In the *2002 National Survey of Secondary Students and Sexual Heath,* 93% reported exclusive heterosexuality; less than 1% reported exclusive homosexuality; and 5% reported bisexual attraction. These latter two groups may be at risk of marginalisation, and young gay men may be at increased risk of contracting a sexually transmitted infection like HIV/AIDS.[3]

Table 4.5 presents data on young offenders' sexual orientation and history of same-sex sexual experience. Females were more likely to report non-heterosexual sexual orientation and to engage in sex with a same-sex partner.

Table 4.5 Sexual orientation and history of sex with same-sex partners

Sexual orientation*	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Heterosexual	99	-	87	-	97	-
Bisexual	1	-	11	-	2	-
Homosexual	<1	-	2	-	1	-
Any sex with same sex partner[ii]						
Yes	1	1	13	19	3	2

a (i) Males=570, Females=105, Total=675; (ii) M=669, F=116, T=785; b (ii) M=203, F=17, T=220. *YPiCHS not available

88% young offenders had never had anal sex

Of the 12% who had:

- *37% had experienced anal sex by 15 years of age*
- *19% had three or more anal sex partners*

1% males and 13% females indicated that they had had sexual partners of the same sex

4.1.3 History of sex work, sex for money or drugs and unwanted sexual experiences

Most of the recent literature on sex work has been conducted in developing countries. However, the studies conducted in developed countries such as the UK and USA show that, for female sex workers, sex work is associated with higher rates of mortality and morbidity including the consequences of STIs, such as pelvic inflammatory disease and infertility, mental health problems, and substance misuse. Once inducted into sex work, female sex workers remained in this work over extended periods of time.[7]

One percent (1%, n=4 males and n=2 females) young offenders reported having worked as sex workers. Most (n=4) reported always using condoms while working as a sex worker.

Non-consensual sexual experiences are associated with a greater prevalence of psychological problems, alcohol misuse, and self harm.[8]

Table 4.6 displays the reported number of times the young person had sex to obtain drugs or money and the reported frequency for the sub-sample who had sex for drugs or money.

Table 4.6 Engagement in sex to get drugs or money and frequency of engagement (%)

Sex for payment	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Had sex to get drugs or money[i]						
Yes	3	2	3	6	3	2
Number of times had sex to get drugs or money[ii] [low n]						
1	12	34	0	100	9	50
2-5	59	33	50	0	57	25
More than 5	29	33	50	0	34	25
Unwanted sexual experiences[iii]						
Yes	4	-	29	-	8	-
Nature of unwanted experiences[iv] [low n]						
Raped when drunk/stoned	43	-	17	-	31	-
Date/partner/ex partner	15	-	34	-	23	-
Family member	14	-	25	-	19	-
Gang/group rape	14	-	8	-	11	-
Acquaintance	7	-	8	-	8	-
Under pressure	7	-	8	-	8	-
Age at unwanted experiences[v] [low n]						
Less than 10 years	19	-	19	-	19	-
10 to 16 years	76	-	71	-	74	-
Over 16 years	5	-	10	-	7	-

a (i) Males=669 Females=116 Total=785; (ii) M=17 F=4 T=21; (iii) M=657 F=114 T=771; (iv) M=14 F=12 T=26; (v) M=21 F=21 T=32; b (i) M=198 F=17 T=215; (ii) M=3 F=1 T=4; (iii, iv, v) data not available. *YPiCHS many times

3% young offenders reported having sex to get drugs or money

8% (4% males and 29% females) reported having unwanted sexual experiences

19% were <10 years old when these occurred

Four percent (4%, n=26) males and 29% (n=33 females) reported having had sex against their will (a forced or unwanted sexual experience, including sexual abuse, rape, and partner/peer pressure for sex).

Of the 72% (n=42) who provided their age at the time of their unwanted sexual experiences, 19% (n=8) were less than 10 years old at the time of the experience. Of the 45% (n=26) young offenders who provided detail about the circumstance of their unwanted sexual experiences, rape (gang rape, date rape, and rape when intoxicated) was the most commonly reported (62%, n=16).

4.1.4 Condom use

According to the *National Survey of Australian Secondary School Students*,[9] condom use increased between 1992 and 1997, but not to acceptable levels. In 1997, 37% of sexually active males in Year 12 used condoms 'sometimes' and 9% 'never' used condoms. More young men

reported using condoms than young women; 63% young men in Year 12, compared with 52% young women.[10]

In 2002, 68% and 53% Year 10 males and females respectively reported using a condom during their last sexual encounter with someone they had just met. Over three-quarters of Year 12 students (75% males and 80% females) said they used a condom at their recent sexual encounter with someone they had just met. The majority of male students in Years 10 and 12 reported using a condom at their most recent sexual encounter with their current girlfriend (84% and 73% respectively). Female condom use at most recent sexual encounter with their boyfriend was lower (65% and 48% for female students in Years 10 and 12 respectively). Over three-quarters of male students in Years 10 and 12 and female students in Year 10 reported using a condom at their most recent sexual encounter with someone they had known for a while; however, a somewhat lower proportion of female Year 12 students did so (59%).

Using data from the *National Longitudinal Study of Adolescent Health*, which followed a sample of 4018 sexually active adolescents between 1994 and 2002, Shafii, Stovel & Holmes (2007)[10] found that adolescents who reported condom use during their first sexual intercourse were more likely than those who did not use condoms to report condom use at their most recent sexual intercourse (on average 6.8 years after sexual debut). They were also half as likely to test positive for chlamydia or gonorrhoea (adjusted odds ratio=0.50; 95% confidence interval=0.26, 0.95). Reported lifetime numbers of sexual partners did not differ between condom users and non-users. This study demonstrated the importance and long term benefits of developing adaptive health behaviours and attitudes through sex education programs prior to engagement in sexual activity.

In the present survey, condom use during sexual intercourse was evaluated for both casual and regular partners (Tables 4.7 and 4.8). A casual sexual partner was defined as a once only sexual partner or a "one night-stand"; a regular sexual partner was defined as someone with whom one had sex on a regular basis.

A notable proportion of young offenders did not use condoms in situations that placed them at an increased risk of contracting HIV/AIDS, an STI or hepatitis. Of the 556 males and 92 females who had had a casual partner, 23% (n=128) males [YPiCHS 33%] and 25% (n=23) females either never used condoms or used them less than half the time when they had penetrative sex with casual partners. Of the 561 males and 98 females who had a regular

Of those young offenders who had casual sex partners, 12% never used condoms

Of the young offenders who had had a casual partner, 23% males and 25% females either never used condoms or used them less than half the time when they had penetrative sex with casual partners.

The two most frequently cited reasons for not using condoms were that they did not like the feeling (40%) or they did not have any at the time they were needed (27%)

Table 4.7 Condom use with casual partners and reasons for low frequency use (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Condom use with casual partner[i]						
Never	12	16	14	31	12	17
Less than half the time	11	17	11	13	11	17
More than half the time	17	28	29	25	19	28
Always	60	39	46	31	58	39
Reasons for using less than half the time[ii]						
Do not like the feeling	39	32	44	25	40	32
Did not have any	29	0	19	0	27	0
Too drunk / on drugs	7	6	12	0	8	5
Prefers natural	7	11	0	0	6	11
Knew partner was safe	4	2	13	0	5	2
Could not be bothered	5	13	0	0	4	12
Did not think about it	2	6	6	0	3	5
Impulsive	3	21	0	25	2	21
Did not know how to use	2	0	0	0	2	0
In a stable relationship	1	0	0	25	1	2
Bad previous experience with condom breakage	1	0	0	0	1	0
Female used other contraceptive methods	0	0	6	0	1	0
Do not feel like it	0	9	0	25	0	11

a (i) Males=556, Females=92, Total=648 (ii) M=97, F=16, T=113; b (i) M=183, F=16, T=199 (ii) M=53, F=4, T=57

partner, 42% (n=236) males and 59% (n=59) females either never used condoms or used them less than half the time when they engaged in penetrative sex with regular partners. These findings are consistent with community data suggesting that young women are less likely to use condoms regardless of whether their partner was casual or steady. [9]

Tables 4.7 (previous page) and 4.8 display condom use frequency and reasons for low condom use with casual and regular partners.

Table 4.8 Condom use with regular partner and reasons for low frequency use (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Condom use with regular partner[i]						
Never	24	31	39	36	27	31
Less than half the time	18	18	20	21	18	18
More than half the time	16	20	13	21	15	20
Always	42	31	28	24	40	31
Reasons for using less than half the time[ii]						
Do not like the feeling	26	21	17	14	25	21
Female used other contraceptive methods	21	0	10	0	19	0
In a stable relationship	11	31	28	57	14	33
Did not have any	13	0	17	0	14	0
Knew partner was safe	9	7	12	0	10	6
Prefers natural	8	9	3	0	7	8
Could not be bothered	5	9	5	0	5	8
Trying to conceive	2	1	5	0	2	1
Impulsive	2	7	0	14	1	8
Did not know how to use	1	1	0	0	1	1
Bad previous experience with condom breakage	1	0	3	0	1	0
Did not think about it	<1	4	0	0	<1	4
Too drunk / on drugs	<1	0	0	0	<1	0
Do not feel like it	0	10	0	14	0	10

a (i) Males=561, Females=98, Total=659 (ii) M=182, F=40, T=222; b (i) M=182 F=14 T=196 (ii) M=71, F=7, T=78

Of those young offenders who had regular sex partners, 27% never used condoms

Of the young offenders who had a regular partner, 42% males and 59% females either never used condoms or used them less than half the time when they engaged in penetrative sex with regular partners

Australian secondary students preferred condoms (64%), oral contraceptives (37%) and the withdrawal method (12%) as forms of contraception.[9] The current young offender samples showed similar preferences with the majority indicating that condoms were their preferred form of contraception (YPoCOHS: 67%, YPiCHS: 55%). Clearly, strategies are needed to improve condom use among this high risk population in view of the high prevalence of STIs, especially chlamydia.

Table 4.9 displays preferred forms of contraception to prevent pregnancy.

Table 4.9 Preferred type of contraceptive to prevent pregnancy (%)

Contraceptive type	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Condom	69	57	56	31	67	55
Pill/oral contraceptive	23	24	13	13	21	23
None	16	25	28	56	18	28
Depo-Provera	2	2	5	6	3	3
Withdrawal method	3	0	2	0	3	0
Implanon	1	1	5	6	2	2
Diaphragm	<1	0	0	0	<1	0

a Males=575, Females=103, Total=678; b M=185, F=16, T=201; Multiple responses permitted

Condoms (67%) were the preferred form of contraception followed by oral contraceptives (21%)

18% had no preference for methods of contraception

4.2 Sexually transmissible infections (STI) and blood borne viruses (BBV)

Sexually transmitted infections (STIs) are communicable diseases that may be contracted through sexual activity (oral, anal or vaginal sex). Young people may be at risk of contracting blood borne viruses and sexually transmissible infections if they do not have the information, skills, support or access to health services to manage issues with sexual development and behaviour that they may encounter during adolescence.

Risk behaviours such as injecting drug use, sharing contaminated injecting equipment, unsafe tattooing and body piercing and unprotected sex have been linked to increased exposure to blood borne viruses and sexually transmitted infections. Adult offender populations have a high prevalence of blood borne viruses such as hepatitis C and HIV and sexually transmitted infections such as syphilis, chlamydia and genital herpes.

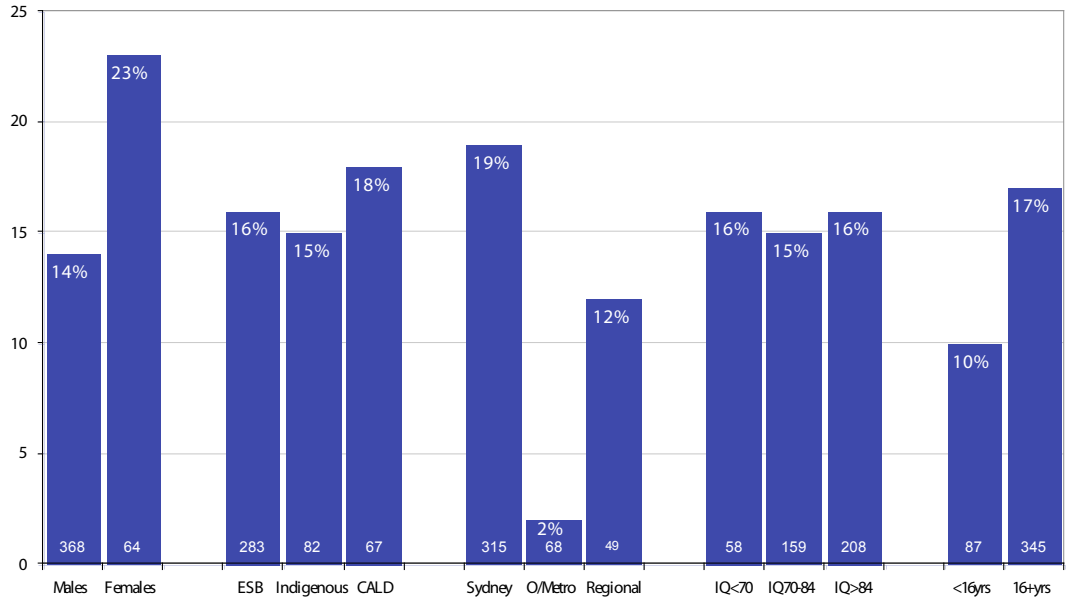
Figure 4.2 displays the frequency of sexually transmitted infections and blood borne viruses within the subgroup of young offenders completing full pathology testing (both serology and PCR/urine screen; n=432). Further detail on pathology tests and response rates can be found in Chapter 1.

Females had a higher frequency of STIs and BBVs than males and urban and regional young offenders had higher rates than other metropolitan. There were no differences in infection rates between ethnic or IQ groups.

Females (23%) had higher rates of STIs and BBVs than males (14%)

Urban and regional young offenders had higher rates than 'other metropolitan'

Figure 4.2 Frequency of STIs and BBVs in young offenders with complete pathology results (%)



4.2.1 Chlamydia, gonorrhoea and other STIs

Chlamydia, gonococcal infection and syphilis are transmitted mainly through sexual contact.

Chlamydia is one of the most prevalent of all STIs. It is a curable STI that is acquired through oral, vaginal or anal sexual contact with an infected sexual partner.[11]

In Australia in 2005, there were 21,692 notifications of chlamydia among young people aged 12-24 years (up from 11,859 in 2001), a rate of 572 per 100,000.[12] This represented over fifty percent of all notifications for chlamydia.[11] Of these, 69% were females. Males are more likely than females to have symptoms of chlamydia. However, up to 75% of people with chlamydia have no symptoms.

The rate of chlamydia notification was more than four times as high in females as males (961 per 100,000 for females compared with 221 per 100,000 young people for males).[12] The rates of

chlamydia notifications for young women have been steadily increasing over time, particularly between 2001 and 2005, when the rate almost doubled. This increase may be related to greater awareness and better diagnosis, although it is possible that young people are increasingly engaging in unprotected sex and frequently changing their sexual partners.[12]

In 2005, 3,564 notifications of gonorrhoea for young people aged 12-24 years were made (up from 2,213 in 2001).[12] This accounts for 43% of the total gonorrhoea notifications in Australia for that year. Rates of notifications were similar for males and females.[12]

Table 4.10 presents sexually transmissible infections for the custody and community orders samples, derived from pathology testing.

Table 4.10 Sexually transmissible infections diagnosed from pathology testing (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Herpes simplex virus-2	7	6	9	18	7	7
Chlamydia	5	6	11	7	6	6
Gonorrhoea	<1	2	1	0	<1	2
Any sexually transmitted infection[i*]	13	13	22	19	14	13

a Males=431-49 Females=72-80 Total=507-29; (i) M=373 F=67 T=440; b M=162-81 F=14-17 T=178-97; (i) M=158 F=16 T=174

* Any of the following: HSV-2, chlamydia, and gonorrhoea. Three cases of syphilis were detected within this group.

14% young offenders had at least one STI

Most young offenders with STIs had received treatment

Table 4.11 displays the self-reported frequency of sexually transmitted infections for both samples and self-reported treatment for the community orders sample.

Table 4.11 Self-report of sexually transmitted infections (%) [self-report of treatment]

Type of STI	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Chlamydia	2	3	6	24	2 [0.4]	4.6
Pubic lice/crabs	1	4	1	6	0.8 [0.5]	3.7
Genital warts	1	<1	4	0	1 [0.8]	0.5
Gonorrhoea	<1	<1	3	0	0.6 [0.5]	0.5
Urinary tract infection	<1	2	1	6	0.3 [0.3]	2.3
Genital herpes (HSV-2)	<1	0	2	0	0.4 [0.3]	0
Syphilis	<1	0.6	1	6	0.3[0.1]	0.9
HIV	0	0.5	0	0	0	0.5

a Males=669, Females=116, Total=785; b M=198, F=17, T=215

The majority of young offenders in the community with STIs other than chlamydia had received treatment; all those with chlamydia in the custody sample had received treatment, as had the majority of those with other STIs.

4.2.2 Herpes Simplex Virus

No data are available to provide estimates of population prevalence of HSV-2 for young people in Australia; however, studies in high risk individuals and selected populations around the world have shown infection is uncommon in people below the age of 15 but seroprevalence increases rapidly from the mid-teens to the mid-twenties.[13] The commonly observed rise in HSV-1 seroprevalence in adolescence is probably due to their expanded social network and the associated increased exposure to HSV-1-infected oral secretions (e.g. kissing of sexual partners). During adolescence, many individuals begin engaging in sexual behaviours that expose them to HSV-2-infected secretions, resulting in genital herpes.[14]

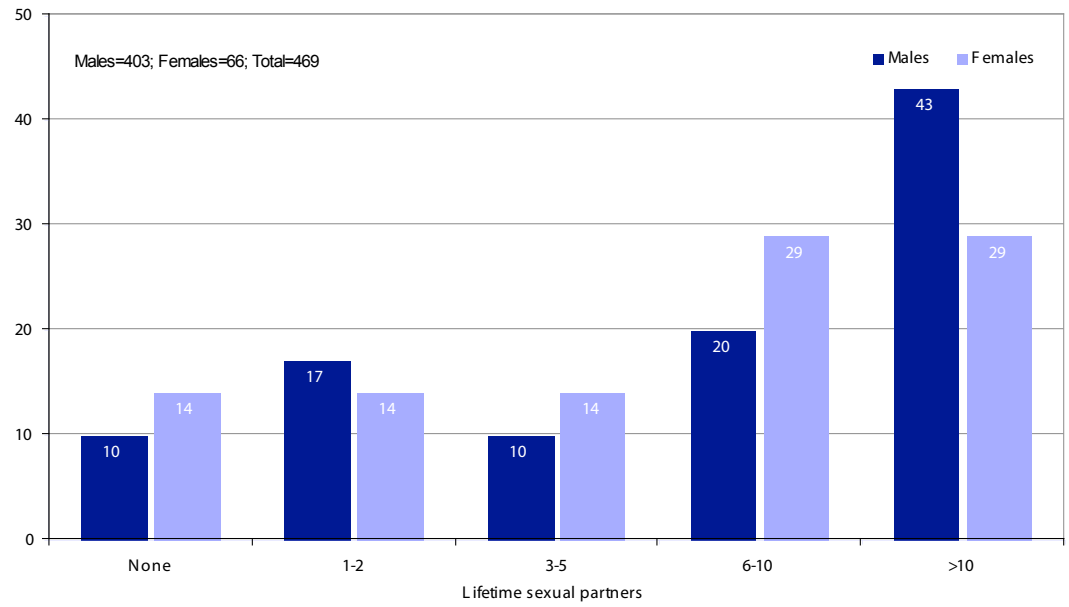
Herpes Simplex Virus Type 1 (HSV-1) was not assessed in the community orders sample; however, self-reported prevalence of a history of cold sores (HSV-1) was 25% (n=167) for males [YPiCHS: 40%, (180)] and 30% (35) for females [YPiCHS: 29%, n=5].

Herpes simplex 1 and 2 viruses are transmitted by direct contact. HSV can be present in semen, vaginal fluids and saliva. The primary difference between the two infections is the site of infection--mucous membranes of the lips and oro-facial skin for HSV-1 and the genitalia for HSV-2.

HSV-2 is a sexually transmitted disease (STD). It causes herpes sores in the genital area and is transmitted through vaginal, oral, or anal sex, especially from unprotected sex. Those who have a prior infection with HSV-1 have an acquired immune response that lowers the risk of acquiring HSV-2. Previous oral HSV-1 infection reduces the acquisition of subsequent HSV-2 infection by 40%.[15] Although genital HSV-1 offers little protection against acquiring genital HSV-2 infection, it usually prevents the severe clinical manifestations observed with many primary HSV-2 infections.[16] A fall in the prevalence of HSV-1 antibodies in adolescence therefore results in a greater number of adults at risk of disease.[17]

Figure 4.3 presents the rate of HSV-2 (genital herpes) by lifetime number of sexual partners. The prevalence of HSV-2 increases sharply with six or more sexual partners.

Figure 4.3 Herpes simplex virus type 2 by lifetime number of sexual partners by gender (%)



Ten percent (10%) males and 14% females who had HSV-2 reported that they had not had a sexual partner. This suggests that there was some under-reporting of sexual activity including contraction through undisclosed consensual sex, incest or other sexual assault.

4.2.3 Blood-borne viruses: hepatitis B and C

Hepatitis B is an infrequent occurrence in Australians, except for those born overseas. The most usual route of transmission is vertical (from mother to child) and through the use of non-sterile medical practices in the countries of origin.

Prevalence of hepatitis C in the general adult community is 0.5%. Table 4.12 (overleaf) presents percentages of custody and community offenders with hepatitis B and C. It shows that, for hepatitis C, prevalence in young offenders on community orders was 10 times higher, and for the young offenders in custody 18 times higher than rates in the general community. No cases of HIV were detected in either sample.

The prevalence of HSV-2 increased sharply with six or more sexual partners

The rate of infection for:

- *males doubled from 20% (6-10 sexual partners) to 43% (>10 sexual partners)*
- *females doubled from 14% (3-5 sexual partners) to 29% (6+ sexual partners)*

Prevalence of hepatitis C in young offenders on community orders (5%) was 10 times higher and for young offenders in custody (9%) 18 times higher than rates in the general community (0.5%)

Table 4.12 Blood-borne viruses: hepatitis B and C (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Hep B core antibody	4	11	4	18	4	11
Hep B surface antigen	<1	3	1	12	<1	4
Hep B surface antibody	23	n/a	33	n/a	24	n/a
Hepatitis C antibody	3	8	12	18	5	9
Any blood borne virus	4	12	14	29	5	13

a Males=431-49, Females=72-80, T=507-29; (i) M=430 F=73 T= 503; b M=180 F=17 T=187; (i) M=162-81 F=14-17 T=178-97

Table 4.13 provides additional interpretation of the hepatitis B results.[18] Criteria for susceptibility to hepatitis B infection are that one does not have a current or previous infection. Immunity due to vaccination occurs when surface antibody (sAb) is positive and core antibody (cAb) is negative. Immunity or natural infection occurs when both sAb and cAb are positive. Acute or chronic infection is indicated by a positive surface antigen (sAg).

Blood test results from the majority of both male and female young offenders on community orders indicated they were likely to be susceptible to hepatitis B infection with only about one third of males and females having evidence of immunity from hepatitis B vaccination. Among both sexes, a small proportion showed evidence of immunity to hepatitis B infection acquired from a previous hepatitis B infection. Active hepatitis B infection was detected amongst a very small proportion of males (<1%).

There were low levels of hepatitis B vaccination in males and females

Only one third of males and females had evidence of immunity from hepatitis B vaccination

Active hepatitis B infection was detected in <1% males and no females

There were no cases of hepatitis A

Table 4.13 Interpretation of hepatitis B results (%)

Interpretation	Males	Females	Total
Susceptible to infection	70	62	69
Immune (vaccination)	26	34	27
Immune (natural infection)	3	1	3
Acute or chronic infection	<1	0	<1
Indeterminate	1	3	1

Males=431; Females=73; Total=504

Only 30% of our study population had protective antibody levels. The majority (70%) remained susceptible to hepatitis B, despite the availability of a vaccine. In view of the high prevalence of risky sexual and drug related behaviours, a three-dose course of the HBV vaccine can be given on an accelerated schedule at days 0, 7 and 21 with comparable seroprotection to the traditional 0, 1 and 6 month course.[19,20] A number of publications have shown this strategy to be highly successful and more acceptable than traditional regimens in similar at risk populations.[21,22] (Note: The accelerated dosing schedule applies to a specific brand of HBV vax (Engerix B). HBV vax, which is funded and supplied through NSW Health to support the HBV program is cheaper than Engerix B but is not suited to the accelerated vaccination schedule. While the accelerated schedule would benefit young offender populations, it has cost implications).

4.2.3.1 Hepatitis A

Hepatitis A, although not a blood borne virus, was also tested. None of those screened were positive for hepatitis A antibody. This finding is consistent with community standards where hepatitis A is almost zero for young people.

4.2.4 Hepatic and metabolic profiles

A hepatic profile is assessed using blood tests for markers of liver function, liver inflammation and specific tests for viruses that cause hepatitis. A metabolic profile includes blood tests for cholesterol, fats and glucose,

along with physical examination findings for weight, body mass index, waist circumference and blood pressure.

The specific tests undertaken in the following analyses are as follows:

i Low-density lipoproteins (LDL) transport cholesterol to the arteries starting the formation of plaques. LDL is commonly referred to as bad cholesterol. Increased levels are associated with atherosclerosis, and heart attack, stroke and peripheral vascular disease.

ii High-density lipoproteins (HDL) or 'good cholesterol' remove cholesterol from arteries and transports it to the liver for excretion or re-utilization. A high level of HDL protects against cardiovascular diseases, and low HDL cholesterol levels [less than 40 mg/dL] increase the risk for heart disease.

iii Alanine transaminase (ALT) is an enzyme present in liver cells. When a cell is damaged, it leaks this enzyme into the blood, where it is measured. ALT rises dramatically in acute liver damage, such as viral hepatitis or paracetamol overdose. Elevations are often measured in multiples of the upper limit of normal (ULN). The reference range is 0- 50 U/L in most laboratories.

iv Gamma glutamyl transpeptidase (GGT) is raised in alcohol toxicity (acute and chronic). It is often elevated above normal in hepatitis and other conditions that cause chemical liver damage.

v Triglycerides, as major components of very low density lipoprotein (VLDL) play an important role in metabolism as energy sources and transporters of dietary fat. High levels of triglycerides in the bloodstream have been linked to risk of heart disease and stroke. However, the negative impact of raised levels of triglycerides is lower than that of LDL:HDL ratios.

For these analyses, normal ranges for adolescent lipids were taken from *The Cholesterol in Childhood Guidelines*.[23] This suggested that there was an increased risk of cardiovascular disease with total cholesterol ≥ 5.18 mmol/L, low density lipoprotein (LDL) cholesterol ≥ 3.4 mmol/L, triglycerides ≥ 2.25 mmol/L and HDL cholesterol ≤ 1.03 mmol/L.

4.2.4.1 Subgroup analysis of young male offenders

More detailed analysis was conducted on the 439 male adolescents with full survey and blood results in this sample. The mean age of this subset was 16.6 years (range 12 -19 years). The majority of males were born in Australia (82.9%), New Zealand (7.2%), Asia (2.7%) or the Middle East (2.3%). Sample characteristics and baseline metabolic and hepatic profile can be seen in Table 4.14 and 4.15.

33% males were either overweight or obese

41% had low HDL cholesterol

Abnormal liver biochemistry:

- *17% young offenders had raised ALT*
- *14% had raised GGT*

4.4% had been exposed to hepatitis B

3.2% had been exposed to hepatitis C

Table 4.14 Sample characteristics of males in subgroup analysis

Males (n=439)	n	%
ESB	292	66.6
Indigenous	72	16.4
CALD	75	17.0
Sydney	312	71
Other metropolitan	68	15.5
Regional	59	13.5
<16 years	91	20.7
16+ years	348	79.3

Table 4.15 Baseline characteristics of males with blood results: n (%)*

Males (n=439)	n	%
Age (years) *mean (SD)*	*16.6 (1.3)*	
Body Mass Index (BMI) *mean (SD)*	*23.69 (4.9)*	
Underweight	15	3.5
Normal weight	266	62.1
Overweight	90	21.0
Obese	57	13.3
Blood sugar levels (mmol/L) *mean (SD)*	*5.8 (1.1)*	
Diabetic	5	1.2
Lipid analysis abnormal[i]	-	
LDL cholesterol ≥ 3.4 mmol/L	44	10.4
HDL cholesterol ≤ 1.03 mmol/L	176	41.4
Triglycerides ≥ 2.25 mmol/L	34	8.0
Hep B sAg positive	3	0.7
Hep B sAb not immune	301	70.0
Hep B sAb immune: vaccinated	110	25.6
Hep B cAb positive	19	4.4
Hep C antibody positive	14	3.2
HIV positive	0	0
Liver biochemistry raised: ALT	76	17.5
Liver biochemistry raised: GGT	62	14.3
Liver biochemistry raised: AST	30	6.9

Note: Levels taken from American Academy of Pediatrics (1992).[23] Cholesterol in childhood guidelines: levels conveying excess cardiovascular risk.

BMI, overweight and obesity, Hep C antibody positive, GGT, AST, total cholesterol, LDL cholesterol and triglycerides were significantly associated with raised ALT

Of note, 33% were either overweight or obese, 10% had raised LDL[i] cholesterol and 41% had low levels of HDL[ii] cholesterol. Abnormal liver biochemistry was present in a large number of adolescents with 17% having a raised ALT[iii] and 14% a raised GGT.[iv] Exposure to hepatitis B and C were both more prevalent in this group than the general community with levels of 4.4% and 3.2% respectively.

The cohort with raised ALT was compared with those with normal ALT (Table 4.16, overleaf).

Overweight (33% vs 18%; p=0.004) and obesity (38.7% vs 6.9%; p<0.001) predicted raised ALT. When combined in multivariate analysis these conveyed a risk (OR) of 6.9 (CI 3.7 – 12.8; p < 0.001; Table 4.17). LDL cholesterol, triglyceride[v] and total cholesterol levels were all higher in those with raised ALT (p<0.001), with LDL and triglycerides remaining significant when controlled for BMI (Table 4.17). There were no significant differences in the HDL cholesterol levels for the two groups. Blood sugar levels, the number of diabetics, exercise levels and alcohol consumption were also not important markers for raised ALT.

Hepatitis C antibody positivity conveyed a very high risk 14.6 (CI: 3.7 – 57.6), although the wide confidence interval is a reflection of the small numbers involved. Young offenders with hepatitis B were too few to have any statistical impact. When adolescents with viral hepatitis were excluded, 76% of those remaining were either overweight or obese and 92.2% had one or more features of the metabolic syndrome. Current smokers had lower ALTs, but this was not found to be significant on multivariate analysis (Table 4.17, overleaf).

Table 4.18 (see page 4.18) presents data on the risk factors associated with hepatitis C antibody in the sub group of young male and female offenders who provided blood samples. Fourteen (3.2%) males and nine (17.2%) females were hepatitis C antibody positive (hep C pos). The comparison of this group with those who were hepatitis C antibody negative (hep C neg) is also presented in Table 4.18. Only males had sufficient numbers for multivariate analyses. Available results for females are discussed below.

Table 4.16 Characteristics of males with and without raised ALT: n (%)*

Characteristics of males	Raised ALT (≥28 IU/L) n=76	Normal ALT (<28 IU/L) n=359	*P* value
Age(years) *mean (SD)*	16.8 (1.4)	16.5 (1.3)	0.173
Body Mass Index (BMI) *mean (SD)*	*28.1 (6.3)*	*22.6 (3.8)*	<0.001
Overweight	25 (33.3%)	63 (18.1%)	0.004
Obese	29 (38.7%)	24 (6.9%)	<0.001
Systolic BP > 140mmHg	8 (10.5%)	22 (6.1%)	-
Blood sugar levels (mmol/L) *mean (SD)*	*5.8 (1.8)*	*5.8 (0.9)*	0.790
Diabetic	1 (1.3%)	4 (1.1%)	0.657
Never exercise or play sport	13 (17.3%)	36 (10.1%)	0.093
Frequent exercise (>2 times/week)	52 (69.3%)	253 (70.9%)	0.828
Current smoker	54 (72%)	301 (84.3%)	0.014
No alcohol use in last 12 months	7 (9.5%)	22 (6.2%)	0.468
Unsafe alcohol use in last 12 months	61 (82.5%)	309 (87.5%)	0.266
Hep B sAg positive	1 (1.3%)	2 (0.6%)	0.96
Hep B sAb not immune	51 (68.9%)	248 (70.7%)	0.815
Hep B sAb immune: vaccinated	20 (27%)	88 (25.1%)	0.757
Hep B cAb positive	3 (4.0%)	14 (4.3%)	0.756
Hep C antibody positive	8 (10.5%)	6 (1.7%)	< 0.001
HIV positive	0 (0%)	0 (0%)	-
GGT (IU/ L) *mean (SD)*	*33.9 (17.4)*	*17.8 (6.1)*	<0.001
Number raised (≥ 28.7)	40 (52.6%)	22 (6.1%)	<0.001
AST (IU/L) *mean (SD)*	31.7 (26)	16.9 (6.1)	<0.001
Number raised (≥ 32.3)	23 (30.3%)	7 (1.9%)	<0.001
Lipid analysis abnormal			
Cholesterol	4.56 (1)	4.1 (0.8)	<0.001
LDL cholesterol	2.8 (0.77)	2.4 (0.7)	<0.001
HDL cholesterol	1.1 (0.3)	1.1 (0.4)	0.759
Triglycerides	1.68 (0.95)	1.2 (0.57)	<0.001

*Unless otherwise indicated, cells display n (percent)

Table 4.17 Multivariate analysis factors associated with raised ALT (males only)

Males	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	*P* value
Anti-HCV	6.9 (2.3 – 20.4)	14.6 (3.7 – 57.6)	< 0.001
BMI: Overweight or obese	7.7 (4.4 – 13.5)	6.9 (3.7 – 13.1)	< 0.001
Current smoker	0.48 (0.27 – 0.85)	0.49 (0.24 – 0.99)	0.05
Total cholesterol	5.3 (2.8 – 9.9)	3.6 (1.7 – 7.7)	0.01
LDL-cholesterol raised	2.5 (1.5 – 4.2)	-	-
Triglycerides raised	5.0 (2.4 – 10.5)	2.1 (0.9 – 5.0)	0.08

Raised ALT in males was strongly associated with anti-HCV and overweight and obesity

Fourteen males and nine females were hepatitis C antibody positive

Table 4.18 Risk factors associated with hepatitis C antibody: n (%)*

Risk factors	Males			Females		
	Hep C pos (n=14)	Hep C neg (n=425)	*P* value	Hep C pos (n=9)	Hep C neg (n=66)	*P* value
Age (years) *mean (SD)*	*17 (0.7)*	*16.6 (1.3)*	0.06	*17.2 (1.9)*	*16.1 (1.1)*	0.016
Body Mass Index *mean (SD)*	*24.2 (6.2)*	*23.7 (4.9)*	0.72	*22.2 (4)*	*24.5 (6)*	0.27
Overweight	2 (15.4%)	88 (21.2%)	0.77	0 (0%)	17 (25.8%)	0.14
Obese	2 (15.4%)	55 (13.3%)	0.77	1 (11.1%)	9 (13.6%)	0.75
Blood sugar levels (mmol/L) *mean (SD)*	*5.8 (0.7)*	*5.8 (1.1)*	0.42	*5.3 (0.4)*	*5.8 (0.8)*	0.12
Never exercise or play sport	6 (42.9%)	43 (10.2%)	< 0.001	2 (22.2%)	17 (25.8%)	0.86
Frequent exercise (>2 times/wk)	7 (50%)	301 (71.3%)	0.115	5 (55.5%)	28 (42.4%)	0.7
Current smoker	12 (85.7%)	344 (81.5%)	0.69	8 (88.9%)	56 (84.8%)	0.86
Alcohol use in past 12 months	12 (85.7%)	388 (93.2%)	0.464	9 (100%)	60 (90.9%)	0.78
None	2 (14.3%)	29 (6.8%)	0.613	0 (0%)	6 (9.1%)	0.8
Unsafe but not too often	12 (85.7%)	339 (79.8%)	0.989	7 (77.8%)	48 (72.7%)	0.94
Illicit drug use in past 12 months	14 (100%)	380 (90.3%)	0.554	-	-	-
Heroin	9 (64.3%)	45 (10.7%)	< 0.001	7 (77.8%)	8 (12.5%)	< 0.001
Marijuana	14 (100%)	379 (90%)	0.21	9 (100%)	56 (87.5%)	0.329
Benzodiazepines	5 (35.7%)	42 (10%)	0.009	6 (66.7%)	15 (23.4%)	0.014
Amphetamines	12 (85.7%)	196 (46.6%)	0.004	8 (88.9%)	35 (54.7%)	0.05
Cocaine	4 (28.6%)	71 (16.9%)	0.28	5 (55.6%)	12 (18.8%)	0.03
Injected drugs in past 12 months	7 (50%)	23 (5.5%)	< 0.001	6 (66.7%)	9 (14.1%)	< 0.001
Unsafe injection in past 12 mths	5 (71.4%)	6 (26.1%)	0.068	5 (55.5%)	2 (3%)	< 0.001
Lifetime sexual partners >11	6 (42.8%)	102 (24.7)	0.221	2 (22.2%)	10 (15.1%)	0.95
Sexually transmitted diseases	7 (50.0%)	110 (25.9%)	0.078	5 (55.6%)	20 (30.8%)	0.32
Sex workers	1 (7.1%)	2 (0.5%)	0.191	1 (11.1%)	0 (0%)	0.12
Condom use with casual sex: never / not always	8 (57.1%)	145 (40.3%)	0.141	3 (33.3%)	34 (51.5%)	0.5
Body Piercing or Tattoos	9 (69.1%)	218 (51.9%)	0.51	8 (88.9%)	56 (87.5%)	0.86
Hep B sAg positive	1 (7.1%)	2 (0.5%)	0.09	0 (0%)	1 (1.6%)	0.89
Hep B sAb not immune	6 (42.9%)	295 (70.9%)	0.050	5 (55.5%)	40 (60.6%)	0.94
Hep B sAb immune: vaccinated	5 (35.7%)	105 (25.2%)	0.354	2 (22.2%)	23 (34.8%)	0.7
Hep B cAb positive	3 (21.4%)	16 (3.8%)	0.02	2 (22.2%)	1 (1.6%)	0.038
HIV positive	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	-
ALT *mean (SD)*	73.3 (130.5)	20.9 (15)	0.03	74.4 (61)	17.1 (14.5)	0.02
Number raised (>28)	8 (57.1%)	68 (16.3%)	< 0.001	6 (66.6%)	5 (7.6%)	< 0.001
LDL cholesterol (mmol/L) *mean (SD)*	2.3 (0.5)	2.5 (0.8)	0.82	2.6 (0.7)	2.6 (0.7)	0.93
Number raised (>3.3)	0	44 (10.7%)	0.20	0	7 (11.1%)	-
Triglycerides (mmol/L) *mean (SD)*	1.36 (0.6)	1.26 (0.7)	0.98	1 (0.5)	1.2 (0.8)	0.34
Number raised (>2.3)	2 (15.4%)	32 (7.8%)	0.32	0	4 (6.3)	-

*Unless otherwise indicated, cells display n (percent)

Risk factors for hepatitis C antibody were the same for males and females:

• heroin use

• injected drugs in the past 12 months

• poly-substance users (benzodiazepines, amphetamines and cocaine)

Females with hepatitis C were more likely to engage in unsafe injecting practices

4.2.4.2 Hepatitis C: Young female offenders

A separate (univariate) analysis of risk factors associated with hepatitis C antibody positive in females was also conducted (see Table 4.18 above). There were insufficient cases for multivariate analyses. Interpretation of significance results for the female sub group needs to be treated cautiously because of the small number of young women who were hepatitis C antibody positive. However, the results of univariate analyses show that the risk factors for females are essentially the same as those for young male offenders - heroin use, injected drugs in the past 12 months (young women showed a stronger tendency to inject unsafely) and more likely to be poly substance users (benzodiazepines, amphetamines and cocaine).

The rate of infection was much higher in females than for males. Seventy-five (75) young women had usable blood samples. Of these, nine (12%) tested positive for hepatitis C antibody. The prevalence of hepatitis C (12%, 9 of 75) is four times the rate of infection compared with males in the sample and given that general community prevalence is estimated at 0.1-0.4% for this age group of females, these young female offenders have a rate that is almost 100 times community rates.

4.2.4.3 Multivariate analyses for male sub group only

Table 4.19 summarises the multivariate analyses for males.

Table 4.19 Unadjusted and adjusted Odds Ratios (OR) and Confidence Intervals (CI) for factors associated with hepatitis C antibody for males

Males	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	*P* value
Raised ALT (liver biochemistry)	6.9 (2.3 - 20.4)	7.4 (2.2 - 25.3)	0.001
Hepatitis B cAb positive	6.8 (1.7 - 26.9)	7.1 (1.3 - 39.9)	0.02
Injected drugs in past 12 months	17.3 (5.6 - 53.6)	7.8 (1.9 - 31.4)	0.004
Amphetamine use in past 12 months	6.8 (1.5 - 31.2)	3.4 (0.6 - 18.5)	0.16
Benzodiazepine use in past 12 months	5.0 (1.6 - 15.8)	1.6 (0.4 - 6.6)	0.55
Heroin use in past 12 months	15.0 (4.8 - 46.8)	-	-
Never play sport or exercise	6.0 (1.9 - 18.6)	-	-

Those young male offenders with hepatitis C antibody were significantly more likely to have injected drugs in the past 12 months (OR 7.8; CI 1.9 - 31.4), have been exposed to hepatitis B (OR 7.1; CI 1.3 - 39.9) and have a raised ALT (OR 7.4; CI 2.2 - 25.3). Use of heroin was highly significant on univariate analysis ($p<0.001$), but clearly followed injecting drug use and lost significance on multivariate testing (Table 4.19). Amphetamine (OR 3.4) and benzodiazepine use (OR 1.6) appeared more common in the group with hepatitis C, but were not significant in the multivariate analysis, possibly due to the small numbers involved. Young hepatitis C positive offenders did not have any increased incidence of risk taking sexual activity when compared to their peers as indicated by similar levels of condom use with casual sex, number of previous sexual partners and incidence of sexually transmitted infections (Table 4.18). While metabolic parameters such as BMI and blood sugar levels were not statistically different between the two groups it did appear that the hepatitis C positive cohort were more likely to never exercise or play sport (42.9% vs 10.2%; $p<0.01$). However, it was their drug use rather than their hepatitis C status that limited their activity.

The most significant risk factor for hepatitis C in males was intravenous drug use. In the 30 current injectors, 7 (23%) were hepatitis C positive. Seventy-one percent (71%) of those with hepatitis C had injected drugs in the past, 54% within the past 12 months, consistent with epidemiological reports that suggest most hepatitis C is acquired in this manner.[24,25] Sexual behaviour was not an important risk factor for hepatitis C as has been shown by a number of other studies.[26,27,28] In view of the relatively high sexual promiscuity in this group, the lack of an association with hepatitis C antibody transmission is significant, although in contrast to a CDC report that suggested 25% of transmission occurred sexually.[25]

Seventeen (17%) males testing positive for hepatitis C antibody had a history of injecting drug use only, 26% tattooing/body piercing only, and 52% a history of both injecting and tattooing/body piercing (5% had missing data on one or more items).

Hepatitis C prevalence was 3.2%, consistent with a report of juvenile offenders from the United States,[29] but lower than a previous Australian report[30] where 21% were hepatitis C positive; although this figure was likely due to extraordinarily high rates of intravenous drug

Of the 75 females with blood samples, nine (12%) tested positive for hepatitis C antibody, a rate four times the rate of infection compared with males in the sample, and 100 times greater than the rate in the general community (0.1-0.4%) of same-age females

In males, hepatitis C antibody positive was associated with:

- *Prior hepatitis B exposure (HepB c Ab)*
- *Higher ALT*
- *Heroin use in past 12 months*
- *Injecting drug use in past 12 months*

Hepatitis C was not associated with:

- *More promiscuous sexual practices (number sexual partners, use of condoms)*
- *Metabolic syndrome*

use in the small sample studied. Hepatitis C antibody was detected at a rate 10 to 40 times that of similar aged adolescents in the United States and Italy.[31,32,33]

The rate of viraemia in the hepatitis C positive adolescents was lower than expected at 42% (5/12, 2 missing). In general, rates of persistent infection of 50-70% are expected in this age group.[31] It is possible this is an underestimation. The blood was not spun down straight after collection and in many cases did not reach the laboratory for 24 hours. Further, the PCR analysis took place a year after collection which may have affected the integrity of the samples.[34]

A follow up blood sample was taken at 12 months post survey to assess the seroconversion rate of this cohort for hepatitis B, C and HIV. Table 4.20 shows the new infection rate at the 12 month follow up of the sub group (n=81) with blood samples at time 2.

In the following 12 months three new cases were detected (3.7%). Of the positive hepatitis cases, none developed chronic disease (sAg). It is known from a number of studies that hepatitis C positivity is extremely high in incarcerated adults, with rates of between 8%[33] and 37%.[35] Given that recidivism rates of up to 69% are common in these adolescents[36,37] there is a clear window of opportunity while they are under supervision to try to reduce future hepatitis C transmissions and infection.

Table 4.20 12 month follow up of subgroup (n=81) with blood samples at time 2

Serology	New cases	Cumulative
Hep B sAg	0 (0%)	3
Hep B cAb	3 (3.7%)	22
Hep C antibody	3 (3.7%)	26
HIV	0 (0%)	0

Those positive for hepatitis C were more likely to be:

- *Older*
- *Users of heroin and other drugs*
- *Drug injectors (and unsafe)*
- *Have been exposed to Hep B (cAb)*
- *Have a raised ALT (liver inflammation)*
- *Not more sexually promiscuous or risk taking*

Recommendations for all females:

- *Vaccinate for hepatitis B*
- *Educate about hepatitis C and clean needles*

Recommendations for hepatitis C positive:

- *Antiviral treatment*
- *Detoxification (methadone/ naltrexone)*

In the 12 month follow up three new cases (3.7%) of hepatitis C were detected

4.2.4.4 Hepatitis C and liver biochemistry: Comparison of Aboriginal and non-Aboriginal young offenders

The analysis reported for males and females above was repeated for Aboriginal and non-Aboriginal young offenders. Table 4.21 shows the baseline characteristics. There were no significant differences found between these two groups on any of the baseline characteristics assessed.

Table 4.22 presents factors associated with raised ALT for Aboriginal and non-Aboriginal young offenders. Once again, the profiles for the two groups were similar; the main difference was a higher rate of dyslipidemia in the non-Aboriginal group. Dyslipidemia is a disruption in the amount of lipids in the blood. In western societies, most dyslipidemias are hyperlipidemias; that is, an elevation of lipids in the blood, often due to poor diet and lifestyle.

Table 4.21 Baseline characteristics of Indigenous vs non-Indigenous young offenders

Risk factors	Indigenous (n=95)	Indigenous (n=419)
Age (years) *mean*	*16.2*	*16.6*
Male gender	73 (76.8%)	366 (87.4%)
Body Mass Index (BMI) *mean*	*23.3*	*23.9*
Underweight	4 (4.4%)	15 (3.7%)
Normal weight	60 (65.9%)	248 (60.5%)
Overweight	12 (13.2%)	95 (23.2%)
Obese	15 (16.5%)	52 (12.7%)
Blood sugar levels mmol/L *mean*	*5.7*	*5.8*
Diabetic	1 (1.1%)	5 (1.2%)
Lipid analysis abnormal[23]		
LDL cholesterol ≥ 3.4 mmol/L	47 (49.5%)	194 (46.5%)
Triglycerides ≥ 2.25 mmol/L	21 (22.1%)	99 (23.7%)
Hep B sAg positive	1 (1.1%)	3 (0.7%)
Hep B sAb not immune	58 (62.4%)	288 (70.2%)
Hep B sAb immune: vaccinated	32 (34.4%)	103 (25.1%)
Hep B cAb positive	4 (4.3%)	18 (4.4%)
Hep C antibody positive	5 (5.3%)	18 (4.3%)
HIV positive	0 (0%)	0 (0%)
Liver biochemistry raised: ALT[i]	17 (17.9%)	70 (17.1%)
Liver biochemistry raised: GGT[i]	13 (13.7%)	66 (15.9%)
Liver biochemistry raised: AST[i]	5 (5.3%)	38 (9.1%)

*Unless otherwise indicated, cells display n (percent); [i]According to analysis in this subsample

Table 4.22 Factors associated with raised ALT: Indigenous vs non-Indigenous

Factors associated with ALT	Indigenous (n=95)			Non-Indigenous (n=410)		
	Raised ALT n=17	Normal ALT n=78	*P* value	Normal ALT n=69	Raised ALT n=341	*P* value
Age (years) *mean*	*16.4*	*16.1*	NS	*16.9*	*16.6*	NS
Body Mass Index (BMI) *mean*	*29.7*	*22.1*	< 0.001	*27.9*	*22.9*	< 0.001
Overweight	1 (6.3%)	11 (14.7%)	NS	24 (34.3%)	68 (20.5%)	0.001
Obese	9 (56.3%)	6 (8%)	< 0.001	24 (34.3%)	24 (7.3%)	< 0.001
Systolic BP > 140mmHg	1 (5.9%)	7 (9%)	NS	7 (10%)	17 (5%)	NS
Blood sugar levels (mmol/L) *mean*	*5.4*	*5.8*	NS	*5.7*	*5.8*	NS
Diabetic	0 (0%)	0 (0%)	-	1 (1.4%)	4 (1.2%)	NS
Never exercise or play sport	4 (23.5%)	6 (7.9%)	NS	11 (15.9%)	47 (13.9%)	NS
Frequent exercise	12 (70.5%)	57 (75%)	NS	48 (69.6%)	218 (63.5%)	NS
Current smoker	10 (58.8%)	64 (84.2%)	NS	53 (76.8%)	287 (84.9%)	NS
No alcohol in past 12 months	1 (5.9%)	10 (13.3%)	NS	8 (11.8%)	16 (4.8%)	NS
Unsafe alcohol use in past 12 mths	13 (82.4%)	58 (77.4%)	NS	55 (80.9%)	300 (89.3%)	NS
Hep B sAg positive	0 (0%)	1 (1.3%)	NS	1 (1.4%)	2 (0.6%)	NS
Hep B sAb not immune	6 (37.5%)	52 (67.5%)	0.03	50 (72.5%)	233 (70%)	NS
Hep B sAb immune: vaccinated	9 (56.3%)	23 (29.9%)	NS	15 (21.7%)	86 (25.8%)	NS
Hep B cAb	2 (11.8%)	2 (2.6%)	NS	3 (4.3%)	14 (4.2%)	NS
Hep C antibody	4 (23.5%)	1 (1.3%)	< 0.001	10 (14.3%)	8 (2.4%)	< 0.001
HIV positive	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	-
GGT raised (≥ 28.7)	9 (52.9%)	4 (5.1%)	< 0.001	38 (54.3%)	22 (6.5%)	< 0.001
AST raised (≥ 32.3)	4 (23.5%)	1 (1.3%)	0.003	27 (38.6%)	5 (1.5%)	< 0.001
Cholesterol level mmol/L *mean*	*4.2*	*4.1*	NS	*4.7*	*4.0*	< 0.001
LDL cholesterol mmol/L *mean*	*2.6*	*2.6*	NS	*2.9*	*2.4*	< 0.001
HDL cholesterol mmol/L *mean*	*1.1*	*1.1*	NS	*1.1*	*1.1*	NS
Triglycerides mmol/L *mean*	*1.7*	*1.1*	0.03	*1.6*	*1.1*	< 0.001

Table 4.23 shows that the two groups are largely the same. Lack of statistical significance (NS) for some factors in the Aboriginal sample may be due to small numbers rather than lack of a true difference compared with non-Aboriginal young offenders.

Table 4.23 Factors associated with hepatitis C antibody positive: Indigenous vs non-Indigenous

Factors associated with Hep C	Indigenous (n=95)			Non-indigenous (n=419)		
	Hep C pos n=5	Hep C neg n=90	*P* value	Hep C neg n=18	Hep C neg n=398	*P* value
Age (years) *mean*	*16*	*16.2*	NS	*17.4*	*16.6*	NS
Male gender	4 (80%)	69 (76.7%)	NS	10 (55.6%)	356 (88.8%)	NS
Body Mass Index (BMI) *mean*	*27.8*	*22.9*	NS	*22*	*23.9*	NS
Overweight	0 (0%)	12 (13.3%)	NS	2 (11.8%)	93 (23.7%)	NS
Obese	2 (40%)	13 (15.1)	NS	1 (5.9%)	51 (13%)	NS
Blood sugar levels (mmol/L) *mean*	*5.1*	*5.7*	NS	*5.7*	*5.8*	NS
Never exercise or play sport	3 (60%)	7 (9.3%)	NS	5 (33.3 %)	53 (16.8%)	NS
Current smoker	3 (60%)	71 (80.7%)	NS	17 (94.4%)	329 (82.7%)	NS
Substance use in past 12 months						
Alcohol: none	0 (0%)	11 (12.6%)	NS	2 (11.1%)	18 (6.1%)	NS
Alcohol: unsafe	5 (100%)	67 (77%)	NS	16 (88.9%)	345 (87.4%)	NS
Heroin	3 (60%)	8 (9.1%)	0.007	13 (72.2%)	45 (11.3%)	< 0.001
Marijuana	5 (100%)	80 (90.9%)	NS	18 (100%)	355 (89.4%)	NS

There were no differences between Aboriginal and non Aboriginal young offenders on BMI, blood sugar, lipid analysis, hepatitis or liver biochemstry

Both Aboriginal and non-Aboriginal young offenders who were Hep C positive were more likely to have used heroin, to have injected drugs and to have injected unsafely in the past 12 months

Table 4.23 Factors associated with hepatitis C antibody positive: Indigenous vs non-Indigenous (cont)

Factors associated with Hep C	Indigenous (n=95)			Non-indigenous (n=419)		
	Hep C pos n=5	Hep C neg n=90	*P* value	Hep C neg n=18	Hep C neg n=398	*P* value
Benzodiazepines	2 (40%)	12 (13.6%)	NS	9 (50%)	45 (11.3%)	< 0.001
Amphetamines	4 (80%)	35 (39.8%)	NS	16 (88.9%)	196 (49.4%)	0.002
Cocaine	2 (40%)	8 (9.1%)	NS	7 (38.9%)	75 (18.9%)	NS
Injected drugs	2 (40%)	5 (5.7%)	0.05	10 (55.6%)	27 (6.7%)	< 0.001
Unsafe injection of drugs	2 (40%)	1 (1.1%)	<0.001	8 (44.5%)	7 (1.6%)	< 0.001
Lifetime sexual partners >11	3 (60%)	22 (24.7%)	NS	6 (33.3%)	101 (25.4%)	NS
Sexually transmitted infections	2 (40%)	27 (30.3%)	NS	10 (55.6%)	103 (25.9%)	0.02
Sex workers	0 (0%)	0 (0%)	NS	2 (11.1%)	2 (0.5%)	0.001
Condom use with casual sex: never / not always	3 (60%)	41 (53.2%)	NS	8 (51.1%)	138 (41.2%)	NS
Body piercing or tattoos	3 (60%)	50 (57.5%)	NS	15 (82.4%)	224 (56.6%)	0.05
Hep B sAg positive	0 (0%)	1 (1.1%)	NS	1 (5.6%)	2 (0.5%)	NS
Hep B sAb not immune	2 (40%)	56 (63.6%)	NS	9 (50%)	279 (71.2%)	NS
Hep B sAb immune: vaccinated	2 (40%)	30 (34.1%)	NS	5 (27.8%)	98 (25%)	NS
Hep B cAb	1 (20%)	3 (3.4%)	NS	4 (22.2%)	14 (3.6%)	< 0.001
HIV positive	0 (0%)	0 (0%)	-	0 (0%)	0 (0%)	-
ALT number raised (>28)	4 (80%)	13 (14.4%)	0.002	10 (55.6%)	60 (15.3%)	< 0.001
LDL cholesterol mmol/L *mean*	*2.6*	*2.5*	NS	*2.3*	*2.5*	NS
Triglycerides mmol/L *mean*	*1.8*	*1.2*	NS	*1.1*	*1.3*	NS

Very few young offenders had accurate knowledge of how HIV (14%), hepatitis B (3%) and C (4%) are transmitted

4.3 Health education

Murray et al. (2003)[29] have shown that the majority of juvenile offenders have a very poor understanding about the transmission of hepatitis C and other blood borne viruses. Only 17% of their cohort could correctly identify risk behaviours for hepatitis C and only 5% knew it was a disease affecting the liver. Our sample showed a similar level of ignorance and misinformation as those in Murray et al. Table 4.24 shows the proportion of young offenders who could correctly identify how HIV, hepatitis B and hepatitis C are contracted.

Table 4.24 Young offenders' knowledge of how HIV, hepatitis B & C are contracted (%)

Knowledge area	Males	Females	Total
Knowledge of how to contract HIV			
None / inaccurate	20	24	21
Mixed	66	62	65
Accurate	14	14	14
Knowledge of how to contract hepatitis B			
None / inaccurate	67	62	66
Mixed	31	35	32
Accurate	3	3	3
Knowledge of how to contract hepatitis C			
None / inaccurate	68	60	67
Mixed	28	34	28
Accurate	4	6	4
Overall knowledge (of all of the above)			
None / inaccurate	19	22	19
Mixed	65	59	64
Accurate	16	19	16

Males=671, Females=116, Total=787

A number of strategies need to be employed to reduce the burden of hepatitis C amongst this population.

One cost effective strategy would be to give each young person coming into contact with the juvenile system prompt cards with simple health messages such as:

To avoid contracting hepatitis C:
1. Cover open wounds
2. Never share IV drug needles, other drug equipment, razors, toothbrushes, manicure tools or other items that could contain contaminated blood
3. Always use sterile equipment when having piercings or tattoos
4. Limit alcohol intake.

4.4 Women's health

Tables 4.25 to 4.27 display data on young female offenders' menstruation, Pap smear and reproductive history.

Table 4.25 Menstruation history (%)

Menstruation	Community[a]	Custody[b]
Age of first menstrual period[i]		
<9	1	0
9 to 10	8	6
11 to 12	52	35
13 to 14	33	41
> 14	6	18
Regular periods	**74**	**82**
Last period		
<1 month	71	0
1 to 2 months ago	16	92
>3 but <4 months ago	3	0
>4 but < 6 months ago	2	0
>6 but <12 months ago	8	8
>12 months ago	1	0
Period pain, discomfort and other problems		
Heavy	4	18
Painful	27	47
Heavy and painful	13	6

a 112-113; b 17

85% young women commenced menstruation between 11-14 years

44% reported heavy bleeding, painful periods, or both

Despite their early age of onset of sexual intercourse, only 33% of the young female offenders had ever had a Pap smear

Human papillomavirus (HPV) infection is one of the most common sexually transmitted infections (STIs) in young women. It is also strongly implicated in the development of cervical cancer. First infection most commonly occurs between 15 and 25 years.[38] Early detection and treatment of pre-cancerous lesions through Pap smear as part of the National Cervical Screening Program has resulted in a decline in cervical cancer incidence and mortality over the past two decades.[39] However, in 2003–2004, less than 50% of young women aged 20–24 years participated in the National Cervical Screening Program.

International data show that only 12-45% of sexually active adolescent girls have obtained Pap smear screening. A recent study of 234 Italian young women aged 11-21 years who had cytology and/or physical examination suspicious for HPV infection reported that only 85 (36.3%) used condoms, the only barrier form of contraceptive effectively protecting against virus, indicating a low awareness of the high risk for contracting HPV infection among young sexually active women.[40]

In a prospective cohort of pregnant adolescents aged 17 years or younger in Western Australia, high prevalences of both chlamydia (27%) and Pap-smear abnormalities (38%) were detected in the screened cohort. The majority of Pap-smear abnormalities were inflammatory atypia, but high-grade Bethseda lesions were also diagnosed.[41]

Table 4.26 (overleaf) shows that only 33% of young female offenders had ever had a Pap smear. This is of concern, given their early initiation into sexual activity, risky sexual practices and the prevalence of abnormal results from the sub sample who reported having a Pap smear. In Australia, in 2007, a

Table 4.26 Pap smear history (%)

Pap smear	Community[a]	Custody[b]
Had pap smear[i]	33	59
Frequency of pap smears[ii]		
Once only	54	60
Twice a year	11	10
Yearly	14	10
Once every two years	22	20
Site of last pap smear[ii]		
Custody	22	70
Community	78	30
Time of last pap smear[ii]		
Past 6 months	39	70
>6 and <12 months	25	20
>12 months and >2 years	28	0
>2 years and <4 years	3	10
>4 years	6	0
Abnormal results[iii]	**6**	**14**

a (i) 113; (ii) 36-37; (iii) 31; b (i) 17; (ii) 10; (iii) 7

Of the 33% who reported having had a Pap smear, 22% had it while in custody

6% reported abnormal Pap smear results

Of the 119 young female offenders in the community sample:

• 29% (35) had been pregnant

• 10% (12) were mothers of one or more children

• 11% (15) reported at least one miscarriage

• 10% (12) reported at least one termination of pregnancy

cervical cancer vaccine was made available to all young women aged 16 to 26 years. The vaccine targets HPV-16, which is found in 50 percent of cervical cancers. Pap smears are, however, still advisable because the vaccine only targets one of the many HPVs.[41]

A sexually active female adolescent who does not use contraception has a 90% chance of becoming pregnant within a year. Teens are more likely to become pregnant if they:

- Begin dating early (dating at age 12 is associated with a 91% chance of being sexually involved before age 19, and dating at age 13 is associated with a 56% probability of sexual involvement during adolescence)
- Use alcohol and/or other drugs, including tobacco products
- Drop out of school
- Have no support system or few friends
- Lack involvement in school, family, or community activities
- Think they have little or no opportunity for success
- Live in a community or attend a school where early childbearing is common and viewed as normal rather than as a cause for concern
- Grow up in poverty
- Have been a victim of sexual abuse or assault
- Have a mother who was 19 or younger when she first gave birth.[43]

Table 4.27 presents the reproductive history of young females offenders including pregnancies, termination and miscarriages.

Of the 118 young female offenders in the community orders sample, 29% (34) had been pregnant 10%; n=12 were mothers of one or more children, 11%; n=15 reported having had at least one miscarriage, and 10%; n=12 reported terminations of pregnancy.

Table 4.27 Reproductive history: Pregnancy, terminations, miscarriages (%)

Pregnancy	Community[a]	Custody[b]
Pregnant at some time	29	29
Currently pregnant	2	0
Had terminated pregnancy	14	12
Had miscarriage	11	12

a 111-117; b 16-17

4.5 Summary and conclusions

The sexual histories of this group of young offenders are cause for serious concern. Most young offenders (88%) reported having had sexual intercourse, including oral and anal sex, commencing at a median age of 14 years. Most had three or more sexual partners. With casual partners, 23% reported never using condoms or using them less than half the time; with regular partners 45% reported never using condoms or using them less than half the time.

Three percent (3%) reported either homosexual or bisexual orientation. Three percent (3%) had sex in order to obtain drugs or money and 8% had experienced unwanted sex including gang, date and acquaintance rape and incest.

Twenty-three percent (23%) females and 14% males had a STI or BBV, including Herpes simplex virus-2, chlamydia and gonorrhoea, and hepatitis B and C. Rates of infection far exceeded rates in same aged community samples. Despite this, very few young people had accurate knowledge of how HIV, hepatitis B and C are transmitted. Hepatitis C antibody positive was associated with prior hepatitis B exposure (HepB c Ab), higher ALT, heroin use in past 12 months and injecting drug use in past 12 months. There were very few differences between male and female or Aboriginal and non-Aboriginal young offenders. There were low levels of hepatitis B vaccination in both males and females.

Of the 118 young female offenders in the community sample, 29% (n=35) had been pregnant, 10% (n=12) were mothers of one or more children, 11% (n=15) reported at least one miscarriage, 10% (n=12) reported at least one termination of pregnancy.

Although public agencies and health and education departments can play a vital role in improving the sexual behaviour and health of young offenders, parents can also be educated with respect to the positive influence they can potentially have on developing positive sexual attitudes and behaviour in their children.

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CHAPTER 5
LIFESTYLE

CONTENTS

LIST OF TABLES

LIST OF FIGURES

5.LIFESTYLE

5.1 Diet and nutrition

Prevention of overweight and obesity at an early age is essential. One third of obese preschool children become obese adults, as do half of obese school-aged children. Remission rates are low (<1% per year) and decline with age.[1]

In a longitudinal study of more than 10,000 9-14 year olds, increase in body mass index (BMI) was found to be higher in those who reported more time playing TV/videos/games and in those who increased their caloric intakes. Cumulative effects during the adolescent years produced substantial gains in body weight.[1] Table 5.1 displays young offenders' eating habits and frequency of consumption of certain food types.

Table 5.1 Reported dietary/nutritional intake (%)

Food/drink type	Never		1-2 per week		3-4 per week		Every day	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Males								
Milk	9	-	19	-	14	-	58	-
Fruit juice	10	-	34	-	21	-	35	-
Breakfast	22	35	24	12	21	13	33	40
Eat fresh vegetables	15	15	27	27	27	22	32	36
Meat pie / burger*	4	8	32	38	33	26	30	28
Fresh fruit	15	20	39	33	20	19	26	29
Take away food	6	9	41	42	32	26	20	22
Potato chips	11	10	39	45	30	23	20	22
Sweet foods**	13	10	43	41	25	20	18	29
Garden salad	25	-	39	-	19	-	18	-
Females								
Milk	22	-	17	-	14	-	47	-
Fruit juice	14	-	28	-	17	-	41	-
Breakfast	34	41	25	24	21	6	21	29
Eat fresh vegetables	16	18	24	18	19	18	41	47
Meat pie / burger*	10	12	49	41	24	12	16	35
Fresh fruit	16	24	39	59	20	0	26	18
Take away food	11	6	54	53	19	6	16	35
Potato chips	10	18	44	29	31	18	15	35
Sweet foods**	12	12	42	53	24	0	22	35
Garden salad	30	-	36	-	16	-	19	-

a Males=668-669, Females=114-116; b M=205, F=17; *Meat pie/burger/hot dog; **Biscuit/doughnut/chocolate/ice-cream /cake

Table 5.2 presents preferred drinks when thirsty. Energy drinks, coffee and tea were preferred by fewer than 1% of both samples.

Table 5.2 Preferred drink when thirsty (%)

Preferred drink	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Water	58	45	67	59	59	46
Soft Drink	22	34	17	29	22	33
Fruit Juice	7	11	9	6	8	10
Milk	7	7	3	0	6	6
Cordial	5	3	3	6	5	3
Alcohol	0	2	0	0	0	1

a Males=665, Females=116, Total=781; b Males=197, Females=17, Total=214

22% males and 34% females never ate breakfast

15% never ate fresh fruit or vegetables

9% males and 22% females never drank milk

20% males, 16% females ate take away food every day

Water was the preferred drink for 59% young offenders, followed by soft drink (22%)

No young offender nominated alcohol as their preferred drink

5.2 Weight, weight management and weight perceptions

Overweight and obesity are among the most common health problems facing young people throughout the world.[2] The prevalence of overweight and obesity in young people has been increasing over several decades, with the most recent figures from Australia suggesting that 30% of boys and 25% of girls are either overweight or obese.[3] A number of studies have suggested that young people from low socioeconomic backgrounds have a higher prevalence of overweight and obesity than those from higher socioeconomic groups[3,4,5,6] and that some cultural groups may be at increased risk.[7]

34% young offenders were either overweight or obese

Body Mass Index (BMI) is calculated by the algorithm [weight in kilograms divided by (height in metres^2)] for all ages. For people under 18 years of age, BMI cut-off curves for overweight and obesity are defined to pass through the standard adult cut-offs of 25 kg/m^2 for overweight and 30 kg/m^2 for obesity. Substantial data link these cut-off points with disease risk in children and adults.[8,9]

4% were underweight

For people 18 years of age or more, a BMI of less than 18.5 kg/m^2 may be used to classify underweight. For this survey, cut-offs on a curve passing through this value were used to identify underweight people under 18 years of age.[10] Four percent (4%) young offenders (3% males and 4% females) were underweight.

23% 16 year old males were obese compared with 3% from the SPANS sample

Comparison data were taken from the *Schools Physical Activity and Nutrition Survey* (SPANS),[3] a study of overweight and obesity in school-attending adolescents. Data for 14-16 year olds are included in the table for comparison with young offender data. Rates of obesity were higher in the community offender sample for 16 year old males and females compared with the SPANS sample.

13% of 16 year old females were obese compared with none from the SPANS sample

Table 5.3 reports BMI results for young offenders on community orders, 34% of whom were either overweight or obese.

Table 5.3 Body mass index for young offender samples and SPANS sample (%)

	Males			Females			Total	
	Comm.[a]	Custody[b]	SPANS	**Comm.[a]**	Custody[b]	SPANS	**Comm.[a]**	Custody[b]
Obese								
14 years and under[i]	10	6	10	9	0	4	10	6
15 years[ii]	11	5	7	4	50	4	10	8
16 years[iii]	23	11	3	13	0	0	21	11
17 years[iv]	12	13	-	19	0	-	13	12
18 years[v]	12	10	-	21	0	-	12	9
19 years and over[vi]	14	30	-	0	0	-	12	30
Total[vii]	**14**	**11**	**-**	**13**	**11**	**-**	**14**	**11**
Overweight								
14 years and under[i]	26	18	22	9	0	19	23	18
15 years[ii]	15	14	18	25	0	13	17	13
16 years[iii]	13	28	24	37	0	12	18	28
17 years[iv]	19	19	-	16	0	-	19	18
18 years[v]	26	23	-	7	0	-	24	21
19 years and over[vi]	37	15	-	50	0	-	38	15
Total[vii]	**20**	**21**	**-**	**22**	**0**	**-**	**20**	**20**

a (i) Males=48; Females=12; T=60; (ii) M=91; F=25; T=116; (iii) M=143 F=30 T=173; (iv) M=224 F=33 T=257; (v) M=139 F=14 T=153; (vi) M=22 F=4 T=26; (vii) M=667 F=118 T=785; b (i) M=17 F=0 T=17; (ii) M=22 F=2 T=24; (iii) M=46 F=1 T=47; (iv) M=70 F=3 T=73; (v) M=31 F=3 T=34; (vi) M=13 F=0 T=13; (vii) M=199 F=9 T= 20

Table 5.4 (overleaf) reports on self-description of weight, weight change efforts and weight loss in past four weeks (prior to survey).

Table 5.4 Body image and weight change effort and weight loss in last four weeks (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Self-description of weight[i]						
Very underweight	6	4	4	0	5	4
Slightly underweight	27	19	12	18	25	19
About the right weight	49	55	42	53	48	55
Slightly overweight	17	18	29	18	18	18
Very overweight	2	4	12	12	3	4
Weight change efforts[ii]						
Not trying to do anything	45	21	41	29	45	22
Gain weight	33	45	10	14	30	43
Lose weight	10	7	38	14	14	8
Stay the same weight	11	27	11	43	11	28
Put on muscle	<1	0	0	0	<1	0
Weight loss behaviours in last 4 weeks[i]						
Eat less food/fat/calories	5	8	18	29	7	9
Not eat for 24hrs/more	2	2	8	0	3	2
Vomit/take laxatives	<1	0	3	0	1	0

a (i) Males=661-6, Females=115-6, Total=777-82; b (i) M=184-201, F=14-17, T=198-218

Females were more likely to describe themselves as overweight, and to have made efforts to lose weight (using all three methods listed in table 5.4) during the last four weeks; in contrast, males were more likely to describe themselves as underweight and to have made efforts to gain weight during the last four weeks. Of the young offenders in the community who had tried to lose weight through caloric restriction (eating less food, fat or calories), 59% (n=27) did so on at least 14 days in the past four weeks. By contrast, 91% (n=20) of those who used fasting (not eating for 24 hours or more) or purging (vomiting or taking laxatives) to lose weight did so on 7 or fewer days in the past four weeks. A similar pattern was evident in the custody sample.

5.3 Risk factors for cardiovascular disease and fatty liver

Cardiovascular disease and fatty liver are among the most commonly associated co-morbidities reported in obese adults and contribute greatly to the overall burden of disease.[8,10] Although the consequences of obesity may not be fully realised until adulthood, risk factors for cardiovascular disease and evidence of fatty liver may be present among adolescents.[9,11] Several studies have found that both weight status and risk factors track into adulthood, suggesting that overt disease may be present at younger ages.[9,12]

The prevalence of overweight and obesity, cardiovascular and liver disease risk factors among young offenders in this study is shown in Table 5.5 (overleaf) with the prevalence from a population based sample of adolescents (mean age 15.4 years) from the *NSW Schools Physical Activity and Nutrition Survey (SPANS)* conducted in 2004.[3] All of the risk factors were substantially more prevalent among young offenders than among the population sample.

33% males were trying to gain weight and 10% were trying to lose weight

10% females were trying to gain weight and 38% were trying to lose weight

Table 5.5 Prevalence of overweight, obesity and abnormal biomarkers in young offenders compared with a representative sample of adolescents from SPANS

	Young offenders		School survey sample	
	Males[i]	Females[ii]	Males[iii]	Females[iv]
Overweight	20.0	22.4	21.5	14.6
Obese	13.7	12.9	6.6	4.4
Serology*				
High ALT	14.9	29.7	9.0	5.3
High LDL	10.2	8.2	4.5	6.3
High Triglycerides	8.3	6.8	1.0	0.0
Low HDL	40.9	21.9	10.7	3.9

*Young offenders with required serology results
[i]Males=446;[ii] Females =75; [iii]Males =290; [iv]Females=204

10% males had high LDL compared with fewer than 5% same aged school sample

41% males and 22% females had low HDL compared with 11% males and 4% females in the school sample

All examined cardiovascular risk factors were significantly associated with overweight and obesity among males but not females after adjusting for other risk factors

People from Aboriginal backgrounds may be at greater risk of cardiovascular and other risk factors than the population as a whole,[13] and for this reason risk factors for young Aboriginal offenders were examined separately. None of the risk factors was more prevalent; however, Aboriginal males (but not females) were significantly less likely to be overweight or obese than the other participants.

Although the prevalence of overweight was similar to males from SPANS, the prevalence of obesity in young male offenders was twice as high as that found in the SPANS sample. Among young female offenders, the prevalence of overweight was over 50% higher, and the rate of obesity was three times as high as the SPANS sample.

The prevalence of cardiovascular disease risk factors is of great concern. Forty-one percent (41%) young male offenders and 22% young female offenders also had low levels of HDL (or good) cholesterol.

The associations of biological risk factors with overweight and obesity in males and females are shown in Table 5.6.

Table 5.6 Associations of biological risk factors with overweight and obesity in young offenders with required serology results

Risk factor	N	%	Odds Ratio (95% CI)	P-value
Males				
High ALT	65	32.9	7.6 (3.9, 14.6)	<0.0001
High LDL	45	51.1	2.5 (1.3, 4.6)	0.003
High Triglycerides	37	73.0	6.8 (3.2, 14.5)	<0.0001
Low HDL	182	42.9	2.3 (1.5, 3.4)	<0.0001
Females				
High ALT	22	39.3	2.1 (0.7, 5.7)	0.2
High LDL	6	16.7	0.3 (0.04, 3.0)	0.3
High Triglycerides	5	80.0	8.3 (0.9, 79.3)	0.03
Low HDL	16	43.8	1.6 (0.5, 4.8)	0.4

* Young offenders with required serology results

Overweight and obese males were 7.6 times more likely to have raised ALT and 6.8 times more likely to have high triglycerides than males with normal weight. They were also more than twice as likely to have high LDL and low HDL cholesterol. These relationships were not observed for females, probably due to the smaller sample size.

All of the examined cardiovascular risk factors were significantly associated with overweight and obesity among males but not females after adjusting for other risk factors. In addition, overweight and obese males were more likely to have elevated ALT (see page 4.15 for definition) after adjusting for cardiovascular risk factors. The small numbers of individuals (6 males, 0 females) with other causes of elevated liver enzymes such as hepatitis were excluded from these analyses.

5.4 Physical and recreational activity

Table 5.7 presents frequency and time spent on sport and exercise and participation in organised sport.

Females were more likely to report never exercising, more likely to exercise for less than 40 minutes and less likely to take part in an organised sport. Males were more likely to report exercising two or more times per week and to exercise for more than one hour.

Table 5.7 Frequency and time spent on sport or exercise, participation in organised sport (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Frequency of sport or exercise[i]						
Never	11	2	30	12	14	3
Once or less per week	19	6	22	18	20	7
Two or more times/week	33	18	22	24	32	18
Everyday	36	74	26	47	35	72
Time spent on exercise[ii]						
Less than 21 minutes	14	9	27	20	16	10
21-39 minutes	11	16	19	33	12	17
40-60 minutes	17	30	15	27	17	30
More than 1 hour	57	45	40	20	55	43
Exercise during the last two weeks[i]						
Daily	20	65	11	35	19	63
Three or more times/week	31	21	12	18	29	21
Once or twice a week	24	6	27	29	25	8
Not at all	24	7	50	18	28	8
Participated in organised sport[i]						
Yes	43	51	22	47	40	51

a (i) Males=667-670, Females=114-6, Total=781-5; (ii) M=649, F=101, T=750; b Males=202-4, Females=15-17, Total=217-21

Table 5.8 shows perception of recreational activities in local areas and type of activities pursued.

Table 5.8 Recreational activity (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Enough recreational activities in local area?*						
Yes	**78**	**69**	**73**	**65**	**78**	**69**
Type spent on recreational activities[ii]						
Sport / physical activity	40	43	23	20	37	41
Social / entertainment / partners	18	25	27	40	19	26
Indoor recreation	14	6	18	0	14	6
Hang around/ relax	9	5	18	13	11	6
Constructive hobby	11	8	4	13	10	8
Use drugs/alcohol/ smoke	5	9	6	7	5	9
Sleeping	2	1	2	7	2	1
Nothing	1	1	3	0	1	1
(Re-)offend	0	2	0	0	0	2
Work	0	2	0	0	0	2

a (i) Males=651, Females=113, Total=764; (ii) M=643, F=108, T=751; b (i) M=201, F=17, T=218; (ii) M=184, F=15, T=199

66% exercised twice a week or more

40% participated in organised sports (43% males, 22% females)

Females were less likely to exercise or to take part in an organised sport than males

78% community sample thought there were enough recreational activities in their local area

5.5 Sun protection

Table 5.9 presents data on the type and frequency of sun protection used by males and females in custody and serving community orders.

Table 5.9 Sun protection behaviours and frequency of use (%)

Behaviour	Never		Rarely		Sometimes		Usually		Always	
	Comm.[a]	Cust.[b]	Comm.[a]	Cust.[b]	Comm.[a]	Cust.[b]	Comm.[a]	Cust.[b]	Comm.[a]	Cust.[b]
Males										
Wear sunglasses	62	53	9	10	17	21	6	9	6	7
Wear clothes covering most of the body (arms & legs)	25	14	21	17	24	32	16	20	14	17
Wear a hat or a cap	16	16	6	5	12	12	13	11	52	56
Wear less clothes so as to get more sun on the skin	33	41	13	15	31	27	14	12	9	5
Spend most time indoors	17	12	21	25	36	36	20	23	6	4
Wear max protection sunscreen (SPF30+)	63	63	13	13	15	15	5	5	5	4
Stay mainly in the shade	19	21	16	16	34	32	22	22	10	10
Females										
Wear sunglasses	40	47	8	6	25	18	7	12	20	18
Wear clothes covering most of the body (arms & legs)	30	18	12	18	22	29	20	12	16	24
Wear a hat or a cap	50	41	14	6	16	24	6	18	14	12
Wear less clothes so as to get more sun on the skin	26	24	8	18	34	41	19	12	13	6
Spend most time indoors	16	12	26	29	27	24	19	12	13	24
Wear max protection sunscreen (SPF30+)	50	53	14	24	16	12	10	6	11	6
Stay mainly in the shade	24	18	10	18	31	35	24	6	11	24

a Males=667- 668, Females=115 -116, Total=782-784; b M=202-204, F=17, T=219-221

63% males and 50% females never used maximun protection sunscreen when in the sun

50% females did not wear a hat or cap when in the sun compared with 16% males

Table 5.10 displays sun screen use behaviour and reasons for rarely or never using sunscreen.

Table 5.10 Sunscreen use and reasons for not using sunscreen (%)

	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Sun protection factor[i]						
Don't use sunscreen	61	64	49	53	59	63
SPF 30+	24	17	33	24	26	18
SPF 15	8	8	13	18	9	9
SPF 12 or lower	1	1	0	0	1	1
Don't remember/know	6	11	5	6	6	10
Reason for rarely or never using sunscreen[ii]						
Takes too long / inconvenient	20	9	100	0	29	8
Not available/hard to get	27	14	0	10	24	14
Don't need it	20	45	0	40	18	45
Don't want to/ don't like it	20	19	0	20	18	19
Not in the sun much	13	0	0	0	12	0
Adverse medical concern	0	3	0	0	0	3
Don't remember	0	5	0	0	0	4
To get a tan	0	6	0	30	0	7

a (i) Males=654, Females=113, Total=767; (ii) M=15, F=2, T=17; b (i) M=204, F=17, T=221; (ii) M=152, F=10, T=162

The two main reasons for not wearing sunscreen were that it took too long to apply and that is was hard to obtain

Table 5.11 displays sun protection behaviour and sunburn history of young offenders during the summer preceding the survey. Forty-six percent (46%; n=359) young offenders were sunburnt at least once during the previous summer; 18% (n=141) were sunburnt 2-3 times; and 11% (n=86) were sunburnt four or more times.

Table 5.11 Time spent outdoors and sunburn history for past summer (%)

	Community[a]	Custody[b]
Time spent outdoors		
None	0	1
< 1 hour	1	2
1-2 hours	7	24
> 2 hours < 4 hours	14	24
> 4 hours < 6 hours	25	25
> 6 hours	52	24
Sore and tender sunburn over past summer		
Not at all	53	64
Once	17	11
Two or more times	18	15
Four or more times	11	10

a 781-782; b 220-221

5.6 Tattooing and body piercing

Tattooing in custody has been linked with hepatitis C transmission.[14] Twenty-seven percent (27%) males and females (total n=211) had at least one tattoo. Of those with a tattoo, 51% males [YPiCHS 66%] and 71% females (total n=111) had been tattooed by a non-professional. Thirty-seven percent (37%) males and 82% females (total n=341) had one or more body piercings. Non-professionals had performed the procedure on 39% males and 17% females (total n=111) who had a piercing. Females were more likely to have had at least one body piercing. Males were more likely to have had a non-professional body piercing, and not to have used new equipment.

Table 5.12 summarises the prevalence of tattoos and body piercings in both samples.

Table 5.12 Tattoos and body piercing (%)

	Males		**Females**		**Total**	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
None	50	48	16	18	45	45
Tattoos only	13	22	2	0	11	20
Piercings only	23	16	57	29	28	17
Both	14	14	25	53	16	17

a Males=667, Females=115, Total=782; b Males=204, Females=17, Total=221

Tables 5.13 and 5.14 (overleaf) present the number of tattoos, setting of tattooing and tattooist qualification.

46% young offenders were sunburnt at least once over the previous summer

11% were sunburnt four or more times

39% young offenders had either a tattoo or a body piercing

55% young offenders had a tattoo, a body piercing, or both

Males were more likely to have tattoos; females were more likely to have piercings

Table 5.13 Number of tattoos, setting and tattooist qualification (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Number of tattoos						
1	40	42	57	43	42	42
2	32	27	20	14	30	25
3 to 5	21	20	16	29	21	21
6 to 10	6	21	7	0	6	11
11 and over	1	0	0	14	1	2
Setting of tattooing[i]						
Custody	2	14	0	0	1	12
Community	93	78	93	89	93	79
Both	5	8	7	11	6	9
Made by non-professional[i]	51	66	71	78	54	68

a Males=176-8, Females=29-31, Total=206-211; b (i) M=41, F=7, T=48; (ii) M=73-4, F=9, T=82-3

54% (51% males, 71% females) of those with a tattoo used non-professionals

Table 5.14 Tattooing: Safety for non-professional tattoos (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Cleanliness of equipment used[i]						
New equipment	47	40	46	43	47	41
Cleaned	44	55	54	43	46	54
Not cleaned	4	0	0	14	3	2
Don't know if cleaned	5	4	0	0	4	4
Cleaning method (if any)[ii]						
Heat sterilisation	27	46	33	0	29	41
Boiling water	23	21	17	33	21	22
Soaked in bleach	17	4	17	33	17	7
Cleaning solution/detergent	16	4	8	0	14	4
Wiped	7	4	17	0	10	4
Alcohol/methylated spirits	10	13	8	33	9	15

a (i) Males=92, Females=22, Total=114; (ii) M=30, F=12, T=42; b (i) M=47, F=7, T=54; (ii) M=24, F=3, T=27

28% young offenders had three or more tattoos

3% young offenders had tattoos with unclean equipment

Tables 5.15 and 5.16 present the number of piercings, the setting of piercing, and conditions under which piercing was conducted.

Table 5.15 Number of body piercings and setting (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Number of body piercings[i]						
1	54	33	12	0	42	23
2	24	27	42	29	29	27
3 to 5	21	27	32	57	24	36
6 to 10	1	13	13	14	5	14
11 and over	0	0	1	0	<1	0
Setting of piercing[ii]						
Custody	<1	7	0	0	<1	6
Community	98	90	100	93	99	90
Both	2	3	0	7	1	4
Made by non-professional[ii]	39	40	17	29	33	38

a Males=232-45, Females=92-4, Total=324-39; b (i) M=15, F=7, T=22; (ii) M=59-62, F=14, T=73-6

30% young offenders had three or more body piercings

33% of those with a piercing used non-professionals

11% young offenders had piercings using unclean equipment

Table 5.16 Safety for non-professional piercing (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Cleanliness of equipment used[i]						
Cleaned	60	62	39	25	57	57
New equipment	28	31	56	75	33	37
Not cleaned / unsure	11	8	6	0	11	7
Cleaning method (if any)[ii]						
Heat sterilisation	38	14	25	NA	36	14
Boiling water	25	7	38	NA	26	7
Cleaning solution/detergent	17	21	13	NA	16	21
Soaked in bleach	8	14	13	NA	8	14
Alcohol/methylated spirits	8	29	13	NA	8	29
Wiped	6	7	0	NA	5	7
Hot water	0	7	0	NA	0	7

a (i) Males=96, Females=18, Total=114; (ii) M=53, F=8, T=61; b (i) M=26, F=4, T=30; (ii) M=14, F=0, T=14

5.7 Fighting and injury

Mortality rates among young people are closely related to injury. More young people in Australia die due to injury than from all other causes of death combined; injury is also the main cause of hospitalisation and emergency medical intervention for young people.[15]

The Australian Bureau of Statistics (ABS) reported differences in injury related hospitalisation rates for male and female teenagers in 1999-2000. The hospitalisation rate for males due to transport accidents was 0.78%, more than double the rate for females (0.32%) (i.e. 779 per 100,000 compared with 323 per 100,000). Injuries resulting from assaults were also more common among males (0.28%), with hospitalisation rate over three times that for females (0.08%) (i.e. 281 per 100,000 compared with 80 per 100,000).[16]

Conversely, the hospitalisation rate for females resulting from intentional self-harm (0.29%) was approximately three times that for males (0.11%) (i.e. 293 per 100,000 compared with 107 per 100,000).[16] These trends in injuries reflect young males' tendency to be more involved in risk-taking behaviours that lead to injury, such as alcohol consumption,[17] unlicensed or driving while intoxicated[18] and physical fights.[17]

The risk of injury differs between other subgroups of adolescents. Socioeconomically disadvantaged youth, young people in remote and rural areas and Indigenous youth are at an increased risk of sustaining physical injuries.[19] For example, lower socioeconomic status is associated with increased risk of suicide and self-harm,[20] increased drug use and increased risk of being injured or killed.[15,17,19] In rural and remote areas, risk taking behaviour is strongly associated with drug and alcohol use, driving incidents and celebrations.[19] Indigenous youth suffer from a number of additional risk factors that can lead to risk taking and suicidal behaviour, including illiteracy, which may result in exclusion and alienation, lack of support networks, drug and alcohol abuse and a persistent cycle of grief in many communities.[21]

In 2004-05 the most frequently reported injuries for Australian young people aged 12-24 years resulting in health action being taken was being cut with a knife, tool or other implement (27%), followed by hitting something or being hit by something (17%) and a low fall (16%). There were no gender differences in the reporting of each of these events. For externally caused injuries between 2004-05, the most common type among young people resulting in hospitalisation was transport accidents (21%, of which 71% were males) followed by falls and exposure to inanimate mechanical forces (each 15%).[22,23]

The following tables display results for up to three injuries described by young offenders. Physical injuries and head injuries are reported separately; however, some head injuries may also be detailed in the physical injury tables. Note that unless specified, in-text references refer to the first injury (of up to three injuries) described by young offenders.

Socioeconomically disadvantaged youth, young people in remote and rural areas and Aboriginal youth are at an increased risk of physical injury

5.7.1 Physical fights

Table 5.17 displays the number of physical fights young offenders were involved in and whether they received medical treatment.

Table 5.17 Number of physical fights during the past six months and subsequent treatment (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Number of fights[i]						
Never	29	28	39	0	31	26
Once	18	15	21	24	18	16
2 or 3 times	23	28	22	47	23	30
4 or 5 times	14	10	14	12	14	10
6 or more times	16	19	5	18	14	19
Medical treatment required as result of the fight[ii]						
Yes	12	18	11	0	12	16

a (i) Males=667, Females=116, Total=783; (ii) M=474, F=71, T=545; b (i) M=200, F=17, T=217; (ii) M=144, F=17, T=161

69% young offenders had been involved in at least one physical fight in the past 6 months

14% had been in 6 or more fights

12% had required treatment as a result of the fight

There were no subgroup differences in the proportions of young offenders involved in physical fights in the past 6 months

Figure 5.1 present physical fights in the last six moths broken down by key subgroups.

Figure 5.1 Physical fights during the last 6 months by gender, ethnicity, region, IQ and age (%)

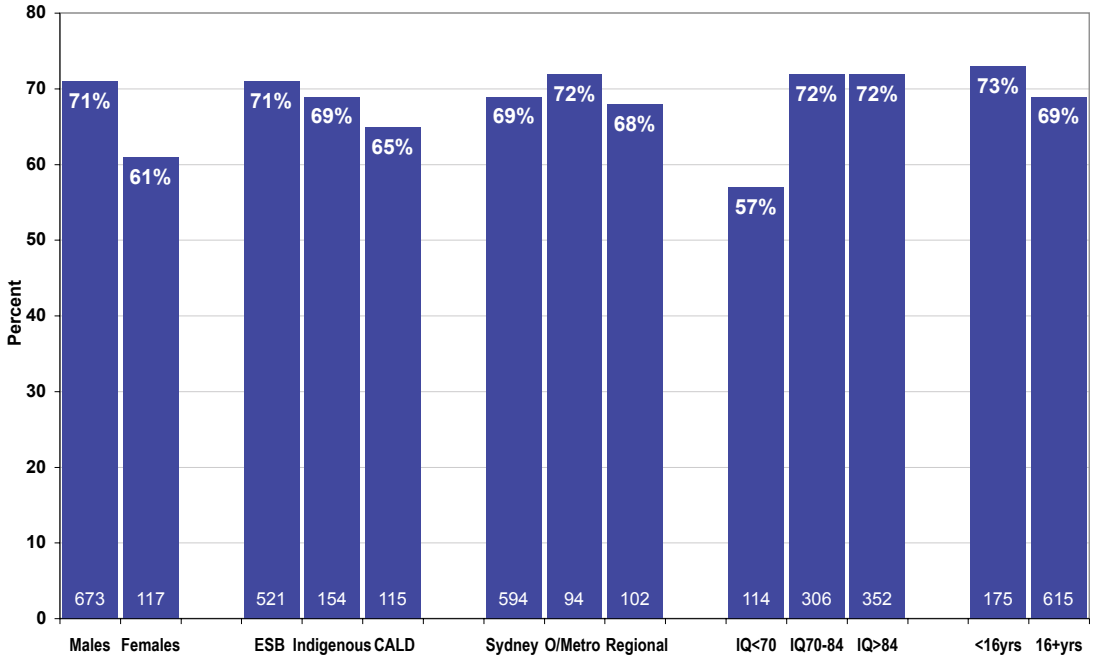


Table 5.18 (overleaf) shows the person(s) with whom young offenders were most recently involved in a physical fight. In both samples most young offenders reported being involved in fight with a stranger (YPoCOHS: 50%, YPiCHS: 54%). The majority of young offenders in both samples were involved in at least two physical fights in the six months before the survey (YPoCOHS: 51%, YPiCHS: 59%). Males showed higher rates of fights with strangers than with friends/acquaintances, while girls showed the reverse pattern, being more likely to become involved in physical fights with friends/acquaintances. These findings have

implications for anger/aggression management training programs with young offenders, in particular in the identification of triggers in interpersonal relationships that result in physically violent reactions.

Table 5.18 Person involved in most recent physical fight(s) (%)

	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Stranger	52	55	26	47	49	54
Friend/acquaintance	34	25	47	53	35	28
Parent/sibling/relative	7	2	10	0	7	2
Other unspecified	7	18	9	0	7	16
Boyfriend or girlfriend	0	0	8	0	1	0

a Males=474, Females=71, Total=545; b M=145, F=17, T=162

5.7.2 Physical injury

Seventy-eight percent (78%, n=532) males and 59% (n=68) females had sustained an injury at some time in their lives requiring them to see a doctor or nurse or to attend hospital. The three leading causes of injuries for males were: being struck by an object or person (21%), low falls (less than one metre) (20%), and cutting, piercing, stabbing (17%). The leading causes of injuries for females were low falls (23%), being struck by object or person (22%), and cutting, piercing, stabbing (20%). Twenty percent (20%) males [YPiCHS 34%] and 30% females (combined n=158) reported at least one injury resulting in a lasting disability; 28% also reported persisting pain as a result of their injury.

Table 5.19 displays general information regarding physical injuries. Most (75%) of the community orders sample and 84% of the custody sample reported some form of physical injury. The most common injury for both the community and custody samples were open or closed wounds (40% and 39%, respectively) followed by fractures (37% and 27%, respectively).

49% of all physical fights involved strangers

Young male offenders were most frequently involved in fights with strangers (52%)

Young female offenders were most frequently involved in fights with friends (47%)

75% young offenders had sustained a physical injury requiring medical attention, 77% of which were fractures or lacerations

Table 5.19 History of physical injuries (%)

History of injuries	Male		Female		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Ever had accident/injury requiring medical attention[i]						
Yes	78	86	59	56	75	84
Accident/injury within the last 12 months[ii]						
Yes	31	n/a	24	n/a	30	n/a
Type of injury[iii]						
Fracture (excl. tooth)	37	27	43	20	37	27
Wound (laceration or cut)	40	40	40	30	40	39
Sprain or strain	0	5	0	30	0	6
Concussion/intracranial	0	6	0	0	0	6
Dislocation	0	7	0	10	0	6
Unspecified nature	5	0	6	0	5	0
Other	18	15	11	10	18	16

a (i) Males=670, Females=116, Total=786; a (ii) M=644, F=115, T=759; a (iii) M=520, F=68, T=588
b (i) M=207, F=18, T=225; b (iii) M=175, F=10, T=85

Table 5.20 (overleaf) shows the types of injuries reported by young offenders by injury incident. Forty percent (40%) young offenders reported open wounds and cuts as their first injury and 46% reported wounds and cuts for their second and third injuries. Other injuries were fracture (37%), unspecified injuries (5%), and contusion (3%).

Table 5.20 Type of physical injuries (by injury incident) (%)

Type of injury	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Wound (laceration/cut)	40	39	46	43	46	34
Fracture (excl. tooth)	37	27	32	25	28	37
Unspecified nature	5	0	4	0	6	0
Contusion	3	3	1	2	4	5
Dislocation	3	4	2	2	3	0
Sprain or strain	3	6	4	6	3	7
Concussion/intracranial	2	7	1	18	2	17
Bite - non venomous	1	<1	3	1	1	0
Burn	2	6	1	1	1	0
Asphyxia	1	0	0	0	1	0
Nerve/spinal cord	<1	1	1	0	1	0
Superficial (excl. eye)	<1	0	1	0	1	0
Eye (excl. foreign body)	<1	1	0	0	1	0
Dental injury	<1	0	0	0	1	0
Poison/toxin (non-bite)	<1	2	<1	0	1	0
Crushing injury	1	<1	1	1	0	0
Injury to blood vessels	<1	0	<1	0	0	0
Traumatic amputation	1	2	1	0	0	0
Bite venomous	<1	1	0	1	0	0
Drowning	<1	0	1	0	0	0

a Injury 1=588, b Injury 1=185; a Injury 2=336, b Injury 2=96; a Injury 3=158; b injury 3=41

Table 5.21 (overleaf) shows the activities being undertaken and the physical location during injuries incurred by male offenders by injury incident.

For young males on community orders injuries were most common during leisure and recreational activities, representing 25% of all activities for the first injury. Other activities were sports and exercise (15%), fighting or involvement in riots (15%), misadventure (13%), and bicycle accidents (7%). For young males in custody the most common activity leading to injury was sport and exercise (23%), followed by fighting (15%) and leisure or recreational activities (11%). For both the community orders (20%) and custody (23%) samples, physical injuries occurred most commonly at home.

Information about the location where injuries occur is not always specified or collected and therefore the available data may not reliably reflect injury locations. Based on limited hospital records of 12-24 year olds in Australia in 2000-01, most young people who were hospitalised for physical injury received their injury in the home (25%), followed by the street or highway (21%).[15]

Table 5.21 Activity and physical location at time of injury (by injury incident) - Males (%)

	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Activity during injury						
Leisure or recreation	25	11	24	15	24	12
Sports/exercise	15	23	18	23	15	27
Fight riot quarrel	15	15	12	21	16	20
Personal misadventure	13	28	13	23	9	22
Pushbike rider	7	0	5	0	8	0
Vehicle driver/passenger	6	7	3	2	3	5
Battery	4	0	7	0	9	0
Pedestrian	3	1	3	3	2	0
Motor cyclist	3	5	4	4	4	5
Crime / being arrested	3	5	3	3	2	7
Household activities	2	1	6	0	1	0
Occupational	2	1	2	1	3	0
Maintenance	1	1	0	1	1	0
Intended self harm	1	1	1	2	2	2
Other transport related	1	0	1	0	0	0
Location at time of injury						
Home	20	23	24	29	20	23
Street or highway	19	21	18	21	18	26
Other specified place	12	4	11	3	12	3
Recreational area	11	16	10	10	9	19
School/day-care/public administration area	9	8	7	5	4	6
Athletics/sports field	8	6	11	12	9	10
Unspecified place	8	0	7	0	12	0
Trade/service area	5	3	6	3	6	3
Friend/relative's house	4	0	4	0	6	0
In custody	2	11	1	12	1	6
Industrial/ construction area	1	1	1	3	2	0
Farm (excl. farmhouse)	0	3	1	1	0	3
Residential institution	0	2	0	1	0	0
Medical hospital	0	2	0	1	0	0

Activity: a Injury 1=496, Injury 2=297, Injury 3=135 [low n]; b Injury 1=177, Injury 2=91, Injury 3=41 [low n]
Location: a Injury 1=514, Injury 2=294, Injury 3=139 [low n]; b Injury 1=149, Injury 2=77, Injury 3=31 [low n]

Table 5.22 shows activities being undertaken and physical location during injuries reported by female respondents by injury incident. For Injury 1, leisure and recreation was the most common activity for female respondents on community orders (23%), followed by personal activities or misadventure (17%), sports and exercise (15%), fighting (12%), and battery (11%). Young females in custody reported personal activities and misadventure as the most common activity during injuries (30%).

Males were more frequently injured during leisure or recreation (25%), during sport or exercise (18%) or in a fight (15%)

Males were more frequently injured at home (20%), on the street (19%) or in recreational areas (11%), a pattern similar to comparison population samples

Table 5.22 Activity and physical location at time of injury (by injury incident) - Females (%)

	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Activity during injury						
Leisure or recreation	23	10	24	20	15	0
Personal misadventure	17	30	13	0	0	0
Sports/exercise	15	10	17	20	8	0
Fight riot quarrel	12	10	13	40	38	0
Battery	11	0	7	0	8	0
Pushbike rider	11	0	5	0	0	0
Vehicle driver/passenger	5	0	3	20	0	0
Household activities	3	10	5	0	15	0
Pedestrian	2	0	2	0	0	0
Other transport related	2	0	1	0	0	50
Crime / being arrested	2	10	3	0	8	50
Motor cyclist	0	10	4	0	8	0
Occupational	0	0	2	0	0	0
Maintenance	0	0	0	0	0	0
Intended self harm	0	10	1	0	0	0
Location at time of injury						
Home	19	50	33	25	27	0
Street or highway	17	13	17	25	20	0
Recreational area	13	13	10	50	20	0
Athletics'/ sports field	11	0	3	0	0	0
Other specified place	11	0	10	0	7	0
School/day-care/public administration area	8	0	7	0	13	0
Friend/relative's house	8	0	3	0	7	0
Unspecified place	6	0	13	0	7	0
In custody	5	13	0	0	0	0
Trade or service area	3	13	3	0	0	0
Residential institution	0	0	0	0	0	0
Medical hospital	0	0	0	0	0	0
Industrial/construction area	0	0	0	0	0	0
Farm (excl farmhouse)	0	0	0	0	0	100

Activity a Injury 1=66, Injury 2=30, Injury 3=13 [low n]; b Injury 1=10, Injury 2=5, Injury 3=2 [low n]
Location a Injury 1=64, Injury 2=30, Injury 3=15 [low n]; b Injury 1=8, Injury 2=4, Injury 3=1 [low n]

For Injury 1, leisure and recreation were the most common activities for females, followed by personal misadventure, sports and exercise, fighting, and battery

Table 5.23 (overleaf) displays the causes of physical injury by injury incident. For Injury 1, being struck by an object or a person was the primary cause of physical injury for both the community orders (23%) and custody (34%) samples, followed by law falls (23% and 25%, respectively).

Table 5.23 Causes of physical injuries (by injury incident) (%)

Causes	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Struck by object/person	33	23	29	40	38	34
Fall – low	20	21	22	20	23	25
Cutting/ piercing/stabbing	15	17	21	15	17	14
Fall - high (>1 metre)	11	5	9	3	10	5
Other specified causes	4	<1	3	0	2	0
Other unspecified	3	0	4	1	2	2
Motor vehicle driver	2	3	1	2	1	2
Motor vehicle passenger	2	4	1	2	1	0
Motorcycle driver	1	5	1	4	1	5
Pedal cyclist	0	9	<1	3	1	11
Hit by car	4	3	2	5	1	2
Fire/flames/smoke	<1	3	<1	1	1	0
Poisoning - other	<1	1	<1	0	1	0
Dog related	1	<1	3	1	1	0
Other transport	1	0	1	0	0	0
Drowning/swimming pool	<1	0	<1	0	0	0
Other threat to breathing	<1	0	<1	0	0	0
Scalds	1	0	<1	0	0	0
Contact burn	<1	2	1	0	0	0
Other animal related	1	2	0	2	0	0
Electricity	<1	<1	0	0	0	0
Firearm	0	1	0	1	0	0

a Injury 1=578, Injury 2=330, Injury 3=152 [low n]; b Injury 1=187, Injury 2=97, Injury 3=44 [low n]

More than half of young offenders reported that physical injuries occurred more than two years before completion of the survey. There was no significant difference between young offenders living in the community and those in custody.

Table 5.24 shows the time categories for all physical injuries by injury incident.

Table 5.24 Recency of physical injuries (by injury incident) (%)

Time of injury	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
1-4 weeks ago	5	5	5	6	1	2
1-6 months ago	12	11	10	14	15	7
>6 months <2 years ago	30	30	29	23	33	33
>2 years <5 yrs	26	27	25	31	33	25
>5 years ago	27	27	31	26	18	33

a Injury 1=588, injury 2=333, injury 3=155; b Injury 1=187, Injury 2=95, Injury 3=43

Twenty-one percent (21%) of the community sample and 33% of the custody sample reported some form of lasting injury or disability resulting from their physical Injury 1. Young offenders in the community orders sample indicated musculoskeletal difficulties were sustained from more than half of all injuries, whereas the majority of young offenders in the custody sample (37%) reported general, unspecified difficulties.

Table 5.25 (overleaf) shows all lasting injuries and disabilities for both the community orders and custody samples by injury incident.

The most frequent causes of physical injuries were falls, being struck by objects/persons and cuts

21% reported lasting disability from their physical injury

Table 5.25 Frequency and type of lasting injuries or disabilities from physical injury (by injury incident) (%)

	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Ever had a lasting injury or disability[i]						
Yes	21	33	17	24	16	26
Type of injury or disability[ii]						
Musculoskeletal	65	39	56	15	59	27
Skin	12	16	15	15	14	0
General/unspecified	8	31	19	35	9	37
Neurological	6	7	6	20	18	27
Eye	5	3	0	0	0	0
Psychological	3	0	4	5	0	0
Ear	1	2	0	0	0	0
Respiratory	1	2	0	10	0	0
Male genital	0	0	0	0	0	9

a (i) Injury 1=561, Injury 2=299, Injury 3=142; (ii) Injury 1=111, Injury 2=48, Injury 3=22 [low n]
b (i) Injury 1=186, Injury 2=96, Injury 3=42; (ii) Injury 1=61, Injury 2=20, Injury 3=11 [low n]

Musculoskeletal difficulties were the most frequent form of disability from physical injury

Table 5.26 shows the type of treatment young offenders reported receiving for their injuries by injury incident.

Table 5.26 Treatment of physical injuries (by injury incident) (%)

Treatment received	Injury 1		Injury 2		Injury 3	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Medical treatment	96	91	95	90	93	86
Self treatment/none	4	9	4	10	6	15

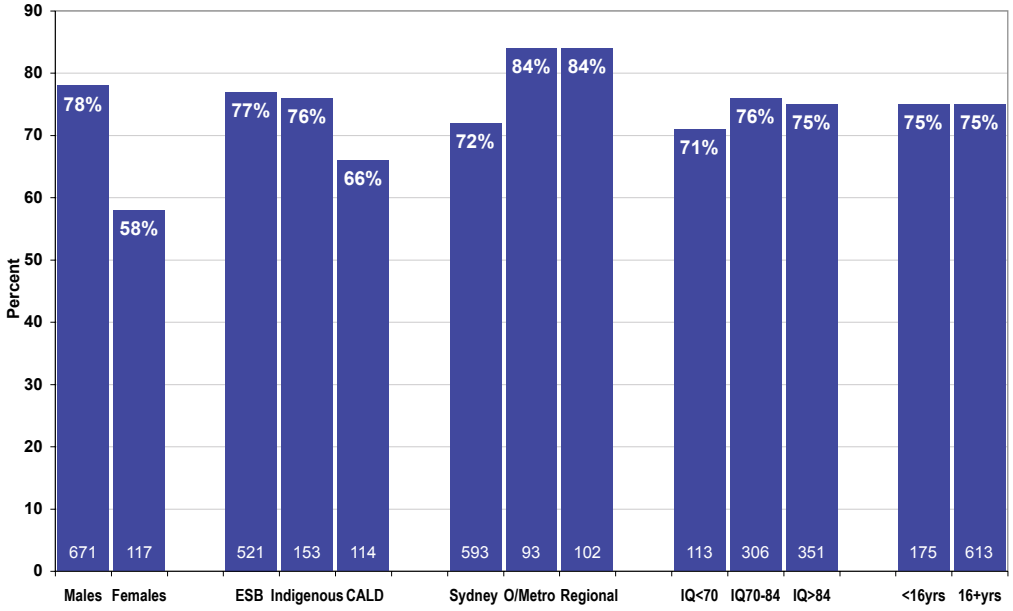
a Injury 1=568, injury 2=321, injury 3=145 [low n]; b Injury 1=186, Injury 2=92, Injury 3=39 [low n]

For injury 1, 21% reported lasting injury or disability as a result of an injury incident

Figure 5.2 presents data on injuries sustained for each of the key subgroups.

There were no subgroup differences in physical injury characteristics

Figure 5.2 Physical injuries by gender, ethnicity, region, IQ and age (%)



For the community orders sample, injuries were divided between accidental or intentional causes. Table 5.27 shows the nature of physical injuries, based on the nature of incidents.

Table 5.27 Accidental or intentional physical injuries (%)

	Males	Females	Total
Accidental	67	75	68
Intentional	33	25	32

Males=510, Females=67, Total=577

Persons most commonly responsible for causing injury to young offenders living in the community were strangers (36%, n=87), followed by acquaintances (18%, n=43) and friends (12%, n=29). For young offenders in custody, injury was most commonly inflicted by other detainees (62%, n=130), followed by partners (15%, n=31), then fathers (9%, n=19).

One third of males and one quarter of females reported injuries that had been intentionally caused. Table 5.28 shows the different persons causing deliberate physical injuries.

Table 5.28 Persons causing deliberate physical injury in past 12 months (%)

Persons causing harm	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Stranger	39	3	24	0	37	3
Acquaintance	18	1	8	0	18	1
Friend	12	2	16	0	12	2
Police	9	1	0	0	9	1
Detainee	6	62	0	70	6	62
Partner (boy/girlfriend)	3	15	32	12	6	15
Other relative	6	5	16	12	6	5
Father	3	10	4	0	3	9
Mother	3	1	0	6	3	2

a Males=213, Females=29, Total=242; b M=195, F=16, T=211

Young offenders reported that 68% of their physical injuries were caused accidentally

Strangers were the most frequently reported to cause deliberate physical injury

5.7.3 Head injury

Studies of adults have shown that damage to the frontal area of the brain, which is responsible for executive functioning,[24] results in recurrent impulsive, aggressive and antisocial behaviour, immature moral reasoning, and a poor appreciation for the subjective experience of others.[25,26,27] The higher frequency of abnormalities in the brain function of offenders[28,29] suggests possible interactions between biological, neurological and social factors that may be associated with violent offending.[30,31,32,33] Neuro-imaging techniques have revealed pre-frontal dysfunction in people who have committed homicide and left temporal dysfunction and hypofrontality (an inability to control violent impulses) in aggressive adults and violent patients. Some support for the relationship between head injury and violent crime, especially murder, has been found in studies of adolescents.[34,35,36] However, results are necessarily based on small sample sizes and identify multiple potential mediating factors such as deficits in social problem solving, language deficits and impulse control.

The most common of many causal explanations for the relationship between head injury and violence assumes a direct effect of a biological or social factor on violent behaviour. Other theories posit interacting effects between biological and social factors. For example, the "threshold effect"[37] proposes that head injuries precipitate violent behaviour in those individuals who are already predisposed to violent behaviour due to the presence of other biological or social risk factors; that is, head injuries lower the "threshold" for violent behavior in the presence of other activating conditions such as alcohol use and specific crime determinants such as victim resistance.[31]

Not every head injury predicts violent behaviour. Most individuals who suffer head injuries do not become violent,[33] suggesting that there are mechanisms that mediate or moderate this association. Substance abuse, poor coping skills, reduced inhibition or restraint, past physical abuse and social and cultural factors are candidate factors. Head injury increases sensitivity to the effects of alcohol, so a head injury may exacerbate the criminogenic effects of alcohol abuse.[33] A direct effect between alcohol abuse and involvement in violent offending among young people has been frequently observed.[38] Both substance abuse and head injury are known to diminish coping skills, judgment and restraint or inhibition.[39] Sustained head injuries may precipitate violence in individuals who already have deficits in those areas.[33] Physical abuse has been implicated as a cause of 95% of serious head injuries in children.[39]

ESB were more likely to report two or more head injuries; IQ<70 were more likely to report no head injuries

Head injury rates in the custody and community orders samples were comparable. Forty-one percent (41%, n=275) [YPiCHS 40%, n=83] males and 30% (n=34) [YPiCHS 6%, n=1] females had sustained a head injury in which they had become unconscious or 'blacked out'. Of these 24% (n=74) reported only one injury; 38% (n=117) reported two or more injuries. Most were the result of being struck by an object or person (including fights) (50%), striking an object or person (12%), or low falls (19%).

Proportions with sequelae from head injury were higher for young offenders in custody, indicating that they may have suffered from more serious head injuries than the community orders sample. Headaches (5%) [YPiCHS 25%], memory loss (4%) [YPiCHS 19%] and poor concentration (4%) [YPiCHS 18%] were the most common unresolved side effects from reported head injury [YPiCHS: low n].

Figure 5.3 presents head injuries where young offenders became unconscious or 'blacked out'. Young ESB offenders were more likely to report two or more head injuries than Aboriginal and CALD offenders, and IQ<70 were more likely to report no history of head injuries compared with IQ 70-84 and IQ >84 subgroups.

Figure 5.3 Number of head injuries resulting in unconsciousness by gender, ethnicity, region, IQ and age (%)

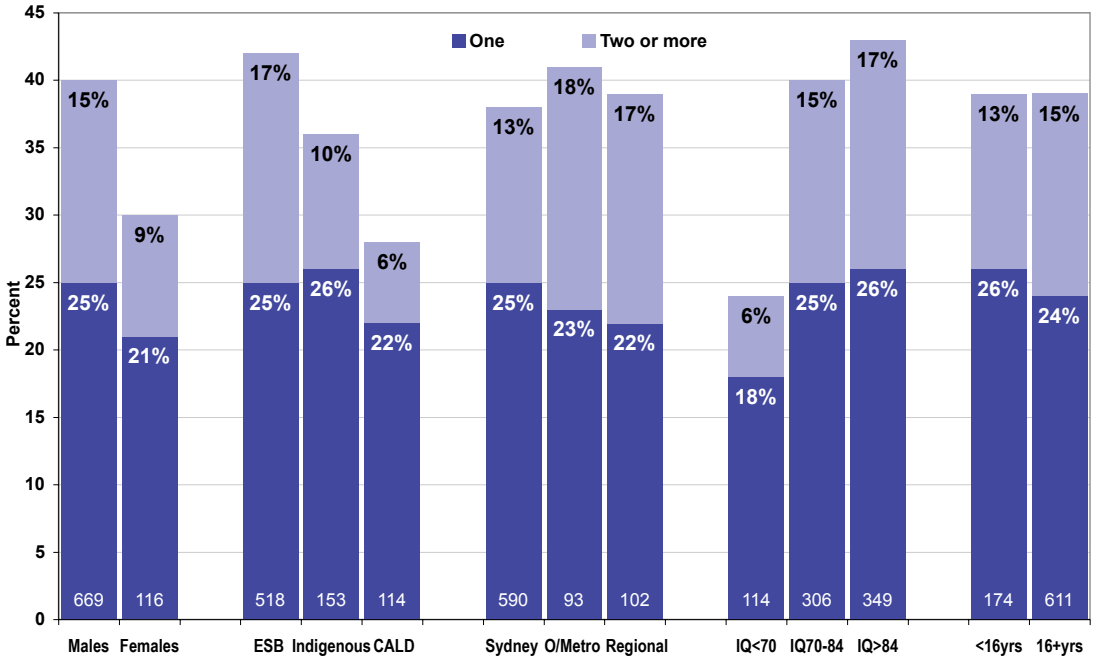


Table 5.29 presents data on prevalence and frequency of head injuries with a community comparison for hospital separations for traumatic brain injury (age 15-19) based on estimated incident cases.[40] The data show similar rates for males but higher rates for females compared with the hospitalisation sample.

Table 5.29 Ever had a head injury and frequency of head injuries (%) [Hospitalisation sample]

Head injury: general	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Ever had head injury						
Yes	41 [40]	40	30 [15]	6	39 [28]	37
Frequency of head injuries						
0	59	61	71	94	61	64
1	25	28	21	6	24	26
2	8	5	5	0	8	4
3 to 4	4	3	2	0	4	3
5 to 6	1	3	2	0	1	3
> 6	2	0	0	0	1	0

a Males=672, Females=116, Total=788; b Males=203-7, Females=18, Total=221-5
Source: O'Connor P (2002). Table 4, Hospitalisation for head injury, 1997–98, age group 15-19 years.[38]

Table 5.30 presents data on the causes of head injuries.

Table 5.30 Causes of head injuries (%)

Cause of head injuries	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Struck by object/person	49	60	47	100	49	60
Fall - low (<1 metre)	19	13	25	0	19	13
Struck object or person	12	0	16	0	12	0
Fall – high (>1 metre)	11	6	9	0	11	6
Hit by motor vehicle	4	2	3	0	4	2
Motor vehicle driver	2	10	0	0	2	10
Bicycle rider/passenger	<1	4	0	0	1	4
Other threat to breathing	<1	0	0	0	1	0
Fitting	<1	0	0	0	1	0
Cutting/piercing/stabbing	<1	1	0	1	<1	1
Motor vehicle passenger	2	1	0	0	<1	1
Motorcycle driver	1	1	0	0	<1	1
Poisoning	0	1	0	0	0	1
Firearm	0	1	0	0	0	1

a Males=252, Females=32, Total=284 [low n]; b Males=83, Females=1, Total=84 [low n]

Table 5.31 (overleaf) presents data on activities being engaged in at the time of head injury 1. Data for head injury incidents 2 and 3 are not reported due to low sample sizes.

40% males and 30% females had sustained a head injury in which they had become unconscious or 'blacked out

38% reported two or more head injuries

The most frequent cause of head injury was being struck by an object or person (49%)

Table 5.31 Activities during head injury 1 (%)

Activity	Males	Females	Total
Sports/exercise	28	10	26
Battery	14	34	16
Leisure/recreation	12	7	11
Personal misadventure	9	17	10
Fight riot	11	4	11
Pushbike rider	9	17	9
Vehicle driver/passenger	8	0	7
Pedestrian	3	3	4
Motor cyclist	5	0	4
Household activities	0	8	1
Intended self-harm	1	0	1

Males=233, Females=29, Total=262 [low n]

Table 5.32 presents data on the causes of head injuries by injury incident with comparison data.[38]

For head injury 1, 37% occurred during sport/ leisure; 16% were caused by battery

For head injury 1, 76% were unconscious for <10 mins; 16% were unconscious >30 mins

Table 5.32 Causes of head injuries (by injury incident) (%) [Hospitalisation sample]

Cause	Head Injury 1		Head Injury 2		Head Injury 3	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Struck by object/person	49 [13]	61	56	69	58	64
High and low falls	30 [18]	19	24	8	22	22
Striking object/person	12 [0]	0	13	0	14	0
Motor vehicle accident	8 [29]	12	5	8	4	7
Other	1 [12]	0	3	0	2	0
Unprotected road user	0 [11]	6	0	11	0	0
Homicide	0 [17]	0	0	4	0	7

a Injury 1=284, Injury 2=106, Injury 3=50 [low n]; b Injury 1=84, Injury 2=26, Injury 3=14 [low n]
Source: O'Connor P (2002). Table 4, Hospitalisation for head injury, 1997–98, age group 15-19 years.[38]

Table 5.33 presents data on the duration of unconsciousness due to head injury by injury incident.

Table 5.33 Duration of unconsciousness following head injury (by injury incident) (%)

Duration of unconsciousness	Head Injury 1		Head Injury 2		Head Injury 3	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Brief moment	52	70	17	70	11	72
< 10 mins	24	0	48	0	61	0
> 10 mins	7	11	10	17	11	7
> 30 mins	12	13	23	13	18	21
More than 24 hours	4	6	2	0	0	0

a Injury 1=272, Injury 2=48, Injury 3=18 [low n]; b Injury 1=70, Injury 2=23, Injury 3=14 [low n]

Table 5.34 (overleaf) presents data on the time since head injury by injury incident.

Table 5.34 Time since head injuries (by injury incident) (%)

Time since injuries	Head Injury 1		Head Injury 2		Head Injury 3	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Within last week	3	1	3	5	4	0
1-4 weeks ago	4	5	9	0	6	7
1-6 months ago	13	8	16	14	21	7
>6 months <2 years ago	32	68	35	64	38	62
>2yrs ago	48	18	37	17	31	24

a Injury 1=301, Injury 2=109, Injury 3=52 [low n]; b Injury 1=84, Injury 2=26, Injury 3=13 [low n]

Table 5.35 presents data on the problems resulting from head injury.

Table 5.35 Problems resulting from head injuries (%)

Problem	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Headache/dizziness	8	31	9	100	8	31
Poor concentration	4	18	12	0	5	18
Memory loss	5	23	6	0	5	22
Personality/behavioural	3	13	3	0	3	13
Weakness	2	3	3	0	2	3
Slurring/speech	2	10	3	0	2	10
Coordination/balance	1	5	6	0	2	5
Anxiety/depression	1	6	3	0	2	6
Blackouts	1	2	0	0	1	2
Vision problems	1	0	6	0	1	0
Scarring/skin	1	0	3	0	1	0

a Males=261, Females=34, Total=295; b Males=61, Females=1, Total=62 [low n]

Table 5.36 presents data on unresolved side effects of head injury.

Table 5.36 Unresolved side effects resulting from head injuries (%)

Side effects	Males		Females		Total	
	Community[a]	Custody[b]	**Community**[a]	Custody[b]	**Community**[a]	Custody[b]
Headache/dizziness	5	31	6	100	5	32
Poor concentration	3	18	9	0	4	18
Memory loss	4	23	3	0	4	22
Personality/behavioural	2	13	3	0	2	13
Weakness	1	3	0	0	1	3
Slurring/speech	1	10	3	0	1	10
Coordination/balance	<1	5	3	0	1	5
Anxiety/depression	1	7	3	0	1	6
Blackouts	1	2	0	0	1	2
Vision problems	<1	0	3	0	1	0
Scarring/skin	<1	0	3	0	1	0

a Males=262, Females=34, Total=296; b Males=61, Females=1, Total=62 [low n]

Table 5.37 (overleaf) presents scans and tests for head injuries.

48% reported that their first head injury occurred more than 2 years ago

Headaches, memory loss and poor concentration were the most frequently reported unresolved side effects

Young offenders in custody were more likely to have unresolved side effects from head injuries than young offenders on community orders

Table 5.37 Scans and tests for head injuries (%)

Scans and tests	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Received any scans or tests[i]						
Yes	30	29	24	0	29	30
Type of scans or tests[ii]						
CT	61	72	80	0	62	72
X-ray	31	28	20	0	31	28
Other	4	0	0	0	4	0
MRI	3	0	0	0	3	0

a (i) Males=269, Females=33, Total=302; (ii) M=67, F=5, T=72 [low n]; b (i) M=75, F=1, T=76; (ii) M=18, F=0, T=18 [low n]

5.7.4 Relationship between head injury and violent offending

In the custody sample, a significantly higher percentage of offenders had committed severely violent offences if a head injury were present than if a head injury were absent

Head injuries and hazardous levels of drinking were strong predictors of severe violent offending

Alcohol augments the impact of head injury by reducing behavioural inhibition

A detailed study of the relationship between head injury and violent offending was conducted for the custody sample only because there was necessarily a better distribution of levels of violence in their offending profile than that in the community orders sample in which there were very few cases with histories of severe violent offending. The sub group who had committed a severe violent offence was compared with the group who had committed less violent offences (no, mild, moderate). Findings showed that there was a significantly higher percentage of offenders who had committed violent offences if a head injury were present than if a head injury were absent (20.0% vs 9.6%, P=0.04) (OR=2.37).The period of time unconscious as a result of the head injury (ie the severity of the head injury) was significantly related to serious violent crime (OR=2.82). This association supports hypotheses that head injury may have an effect on violent offending by increasing the vulnerability of a young person through impairing cortical control and lowering the threshold for violence,[41] or through adding to the burden of multiple stressors, thus weakening restraints that prevent violence.[37] The observation that head injuries are associated with violent crime in both young people and adults indicates the important aetiological role such trauma may play in serious violent offending. The significant relationship between the number of unconscious episodes and the persistence of symptoms of head injury suggests a "dose-response" effect; the accumulation of stressors specific to head injury (i.e. the number of post-head-injury symptoms) that accompany each period of unconsciousness may increase the risk of severely violent behaviour.

Table 5.38 shows the results of the logistic regression analysis and the factors that predicted moderate/severe violence and severe violence.

Table 5.38 Logistic regression model of predictors of moderate/severe violent offending and severe violent offending (%)

	Odds ratio	95% CI (lower)	95% CI (upper)	Significance
Predicting moderate/severe violence				
CALD v. ESB	2.41	1.04	5.63	0.041
Indigenous v. ESB	0.66	0.38	1.15	0.144
Predicting severe violence				
CALD v. ESB	3.15	1.19	8.33	0.021
Indigenous v. ESB	0.33	0.11	0.97	0.043
Head injury v. no head injury	2.52	1.11	5.72	0.027
Harmful drinking v. non-harmful or no drinking	2.72	1.00	7.36	0.049
Severe conduct disorder v. no, mild or moderate conduct disorder	0.38	0.16	0.92	0.031

No single factor can explain why young people commit a violent crime, and it is probably the comorbid presentation of head injuries, alcohol use and possibly ethnic status that best explain such involvement. The link between head injury, substance use, developmental vicissitudes and impaired executive function as a feature of violent crime is well known, without direct causal pathways yet established.[24] Our results support the hypothesis that severe violence reflects disinhibition of control processes. It is probable that risk of disinhibition is greater when other factors as well as a history of head injury are present, such as cultural factors predisposing a person to the use of violence, substance abuse, or victim resistance.

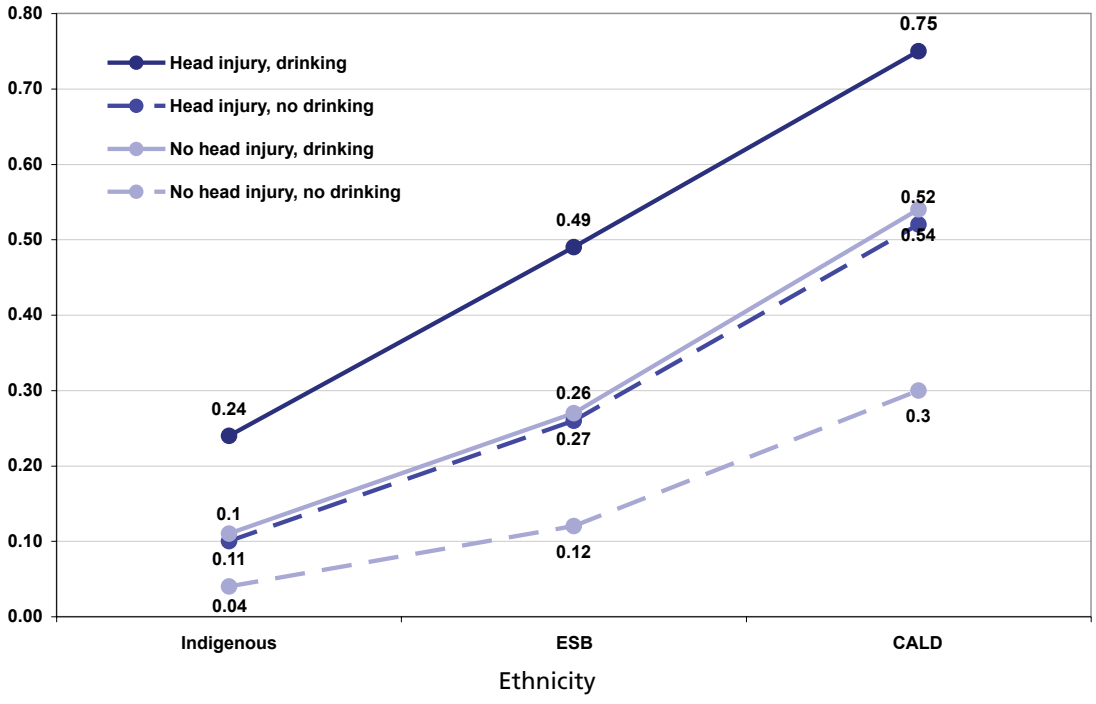
Alcohol has an important role to play in augmenting the impact of head injuries on violent crime. Alcohol acts as a central nervous system depressant and reduces the inhibition of behaviour. If head injuries increase the risk of disinhibition, and alcohol increases the risk of disinhibition, the two together should show synergistic effects, and this was clearly evident in our results. A disinhibition hypotheses would posit that alcohol use and head injury together would have a stronger relationship with violent crime than either alone; that is, they would act as cumulative stressors.

We have insufficient information to understand precisely what characteristics of our aggregated ethnic group (CALD) contributed to serious violent offending. One possible explanation is the higher prevalence of aggravated sexual assault in particular ethnic groups; another is the tendency for some ethnic groups to operate in gangs; yet another is that in some cultures, physical abuse of children is endemic and this practice both increases the risk of head injury and socialises children to act violently. Some research suggests that specific stressors such as refugee status and being unaccompanied to a new country as a minor increase the likelihood of involvement in the criminal justice system.[42] Not only did the CALD group have the lowest relative rate of head injury, but their general over representation in violent crime suggests other as yet unknown causal factors are operating. Further research on the contribution of these factors to serious violent crime is needed. It is of note that both Aboriginal status and absence of severe conduct disorder (as assessed by the APS-SF) were protective factors against severe violent offending in this sample.[43]

Figure 5.4 shows the relationship between the predictive factors for the subgroup without severe conduct disorder.

CALD young offenders with head injury and hazardous drinking were at highest risk of severe violent offending

Figure 5.4 Probability of committing a severely violent offence: Relationship between the predictive factors for the subgroup without severe conduct disorder



5.8 Summary and conclusions

Cardiovascular disease and fatty liver are among the most commonly associated co-morbidities in obese adults and risk factors for these conditions may begin in childhood and adolescence. In this sample, 34% young offenders were either overweight (20%) or obese (14%). All examined cardiovascular risk factors were significantly associated with overweight and obesity among males but not females. There were no differences between Aboriginal and non-Aboriginal young offenders, although Aboriginal males were significantly less likely to be overweight than all other participants. Eating habits were not significantly associated with overweight or obesity, perhaps due to selective reporting. However, 20% males and 16% females reported eating take-away food every day. Forty percent (40%) of young offenders reported participating in organised sport; 67% reported exercising at least twice a week. Females were less likely to exercise or participate in sport than males.

Some health messages had not penetrated this group. For example, 63% males and 50% females reported never using sun protection when in the sun; 46% were sunburnt at least once in the previous summer. Fifty-five percent (55%) of young offenders had either a tattoo or a body piercing or both. Between 33% (piercing) and 54% (tattoo) used non-professionals to do their piercing or tattoo.

The majority (75%) of young offenders had sustained an injury at some time that required medical treatment. Sixty-nine percent (69%) had been involved in at least one physical fight in the previous six months, of whom 12% had required medical treatment as a result of the fight. Lacerations and fractures were the most commonly reported physical injuries. Young male offenders were most frequently involved in fights with strangers (52%); young female offenders were most frequently involved in fights with friends/acquaintances. Thirty-three percent (33%) males and 25% females reported that that their injuries had been intentionally caused.

The proportion of both custody and community based young offenders with head injury far exceeded available adolescent population estimates, perhaps by as much as ten times. Forty-one percent (41%) males and 30% females had sustained a head injury in which they had become unconscious. The most frequent cause of the head injury was being struck by an object or person (49%). Headaches (5%), memory loss (4%) and poor concentration (4%) were the most commonly reported unresolved side effects of the head injury. Young offenders in custody reported significantly higher proportions of unresolved side effects.

Head injuries and hazardous levels of alcohol consumption were strong predictors of severe violent offending. CALD young offenders were more likely to commit a severe violent offence than either ESB or Aboriginal young offenders.

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CHAPTER 6
COGNITIVE ABILITY

CONTENTS

LIST OF TABLES

LIST OF FIGURES

6.2

6. COGNITIVE ABILITY

Assessment of cognitive ability is an important component in understanding youth crime and in programming for young offenders. A number of studies using different methods have concluded that low IQ is a risk factor for offending.[1,2] Individuals with lower IQ scores self-report more delinquent acts than individuals with higher IQ scores,[1] and the self-reported IQ-delinquency relationship is still evident when ethnicity, socioeconomic status (SES), and IQ test motivation are controlled.[3] Therefore, the IQ-crime relationship is not simply a matter of greater police detection of less intelligent offenders, but an opportunity to identify criminogenic risk factors that present independently and within the context of individual and environmental factors.[2,4]

Moffitt (1993)[5] proposed that lower cognitive ability may characterise life-course-persistent criminals who are more likely to have a 'neuropsychological deficit' identified by poor performance on tests of cognitive ability. He further proposed that adolescent limited offenders (i.e. those who engage in transient antisocial behaviour during their adolescence) would show cognitive profiles that more closely resemble age matched adolescents. Their better cognitive functioning allows this sub group of adolescent offender to desist from criminal behaviour once they reach adulthood. Limited support for this hypothesis has been found.[4]

Accordingly, intelligence tests were administered to estimate reasoning ability and academic potential. The *Wechsler Abbreviated Scale of Intelligence* (WASI) scores [average score = 100; standard deviation (SD) = 15] were compared with the normative sample for the test and show the normal distribution taken from the standardisation sample[6] (Figure 6.1 overleaf).

Table 6.1 presents WASI subscale results for both community orders and custody samples.

Table 6.1 WASI subscale scores for community orders and custody samples (%)

Subscales	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
WASI Full Scale IQ						
Intellectually disabled (IQ<70)	15	17	17	21	15	18
Borderline (IQ 70-79)	28	27	22	26	27	27
Low average (IQ 80-89)	28	30	35	37	29	31
Average (IQ 90-109)	27	24	26	16	26	23
High average (IQ 110-119)	2	<1	1	0	2	<1
Superior (IQ 120-129)	<1	1	0	0	<1	1
Very superior (IQ>129)	0	0	0	0	0	0
WASI Verbal IQ						
Intellectually disabled (IQ<70)	23	32	19	21	23	31
Borderline (IQ 70-79)	34	33	30	21	33	32
Low average (IQ 80-89)	23	22	29	37	24	23
Average (IQ 90-109)	18	11	21	21	18	12
High average (IQ 110-119)	2	0	1	0	2	0
Superior (IQ 120-129)	<1	2	0	0	<1	1
Very superior (IQ>129)	<1	0	0	0	<1	0
WASI Performance IQ						
Intellectually disabled (IQ<70)	8	7	8	21	8	8
Borderline (IQ 70-79)	13	15	17	11	14	15
Low average (IQ 80-89)	22	19	19	37	22	21
Average (IQ 90-109)	49	53	56	26	50	51
High average (IQ 110-119)	6	4	1	5	6	4
Superior (IQ 120-129)	1	1	0	0	1	1
Very superior (IQ>129)	0	0	0	0	0	0
WASI culture fair Full Scale IQ						
Intellectually disabled (IQ<70)	12	16	12	21	12	16
Borderline (IQ 70-79)	23	26	19	26	22	26
Low average (IQ 80-89)	27	29	31	37	28	30
Average (IQ 90-109)	34	27	37	16	35	26
High average (IQ 110-119)	3	<1	0	0	3	<1
Superior (IQ 120-129)	<1	1	0	0	<1	1
Very superior (IQ>129)	0	0	0	0	0	0

a Males=671-673, Females=113-115, Total=784-788; b Males=209-210, Females=19, Total=228-229

Compared with other adolescents, many more young offenders on community orders may have difficulty comprehending, communicating and problem solving using language or numbers

In the community orders sample

- *15% had Full Scale IQ<70*
- *23% had Verbal IQ<70*
- *8% had Performance IQ<70*
- *12% had culture fair Full Scale IQ<70*
- *less than 1% young offenders scored in the superior/very superior IQ range*

Many young offenders scored in the borderline or low average ranges on both the cognitive and academic tests. The pattern of results suggests that, compared with other adolescents (represented in FIgures 6.1-6.5 by the theoretical normal curve), many more young offenders on community orders may have difficulty comprehending, communicating and problem solving using language or numbers.

6.1 Full Scale IQ

The average WASI Full Scale IQ (FSIQ) score for young offenders on community orders was 83 (SD: 13, range: 52 to 128). Seventy-two percent (72%) scored below the average range for the test, compared with 25% from the standardisation sample (see Figure 6.1).

72% young offenders scored below the average range for the WASI compared with 25% from the WASI standardisation sample

25% scored in the average range for the WASI

3% scored in the above average range or better

The pattern of IQ scores was similar for custody and community orders samples and for males and females

Figure 6.1 WASI Full Scale IQ scores by gender (%)

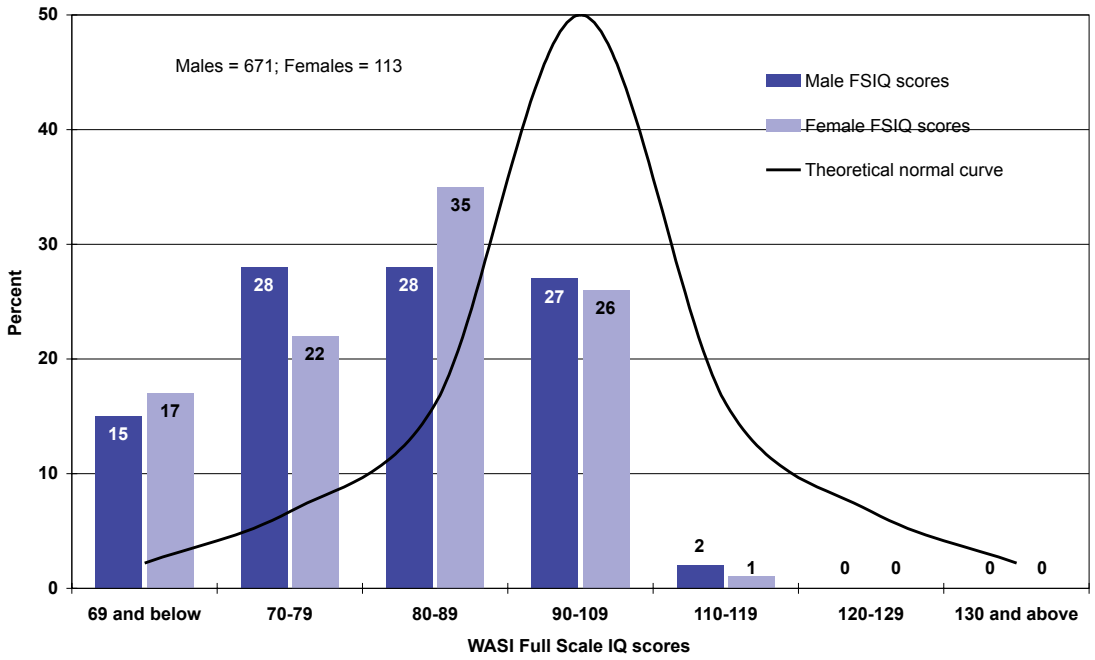
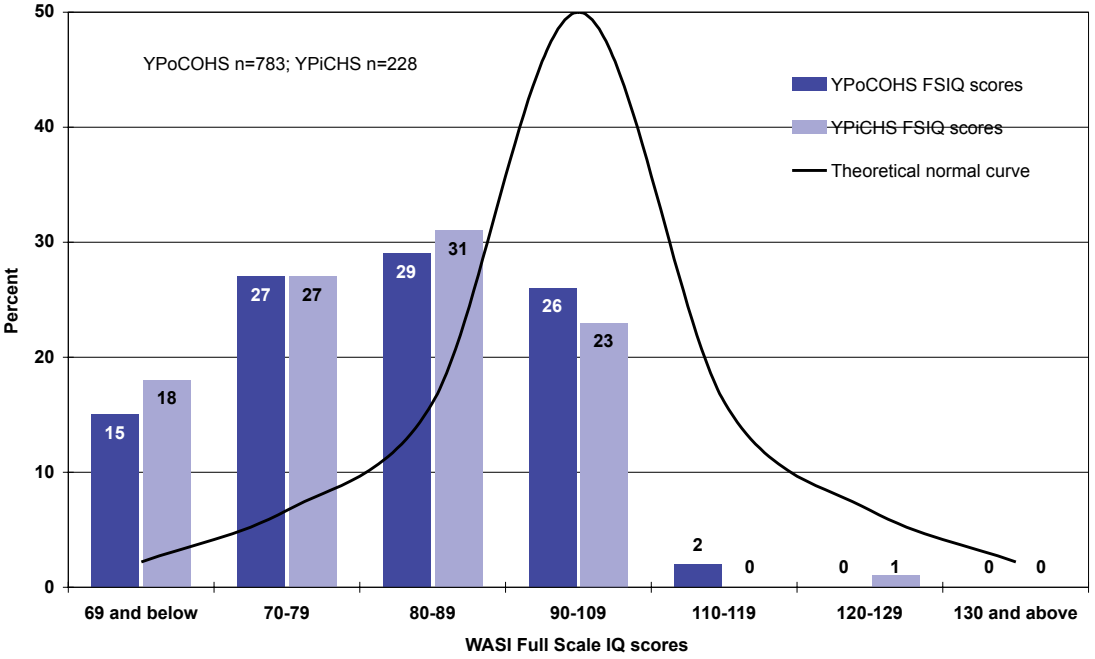


Figure 6.2 presents WASI full scale IQ scores for both samples.

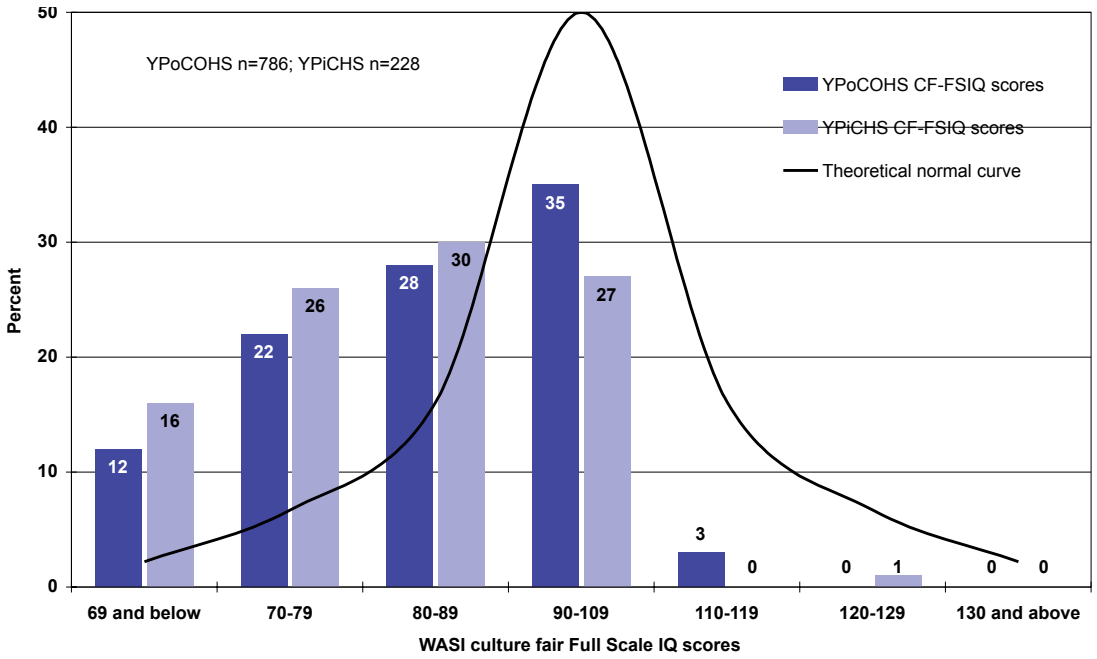
Figure 6.2 WASI Full Scale IQ scores for community orders and custody samples (%)



6.1.1 Culture fair IQ assessment

'Culture fair' IQs were calculated using the Full Scale IQs for young offenders from an English-speaking background, and the Performance IQs for Aboriginal and culturally and linguistically diverse (CALD) young offenders (Figure 6.3). The overall pattern of results for culture fair testing was similar to the WASI Full Scale IQ scores, except that there was an increase in those scoring in the average range for the test: 26% (FSIQ for all young offenders used) compared with 35% (PIQ used for CALD and Aboriginal groups) using culture fair testing. A detailed discussion of the use of culture fair IQ testing to determine intellectual disability is presented in section 6.4.

Figure 6.3 WASI culture fair Full Scale IQ scores for community orders and custody samples (%)



6.1.2 Comparison of Verbal IQ (VIQ), Performance IQ (PIQ) and Full Scale IQ (FSIQ) scores

Scores for subtests assessing practical reasoning (fluid intelligence skills or ability to solve non-verbal problems) were closer to the normative group for the tests used compared with scores on the verbal IQ subscales. The mean FSIQ score of 83 fell within the low average range. The mean VIQ score of 79 fell in the borderline range. The mean PIQ score of 91 fell in the average range. Means for the custody sample fell in the same ranges [YPiCHS: FSIQ=82, VIQ=76, PIQ=91].

Figures 6.4 and 6.5 (overleaf) present verbal and performance IQ scores by gender.

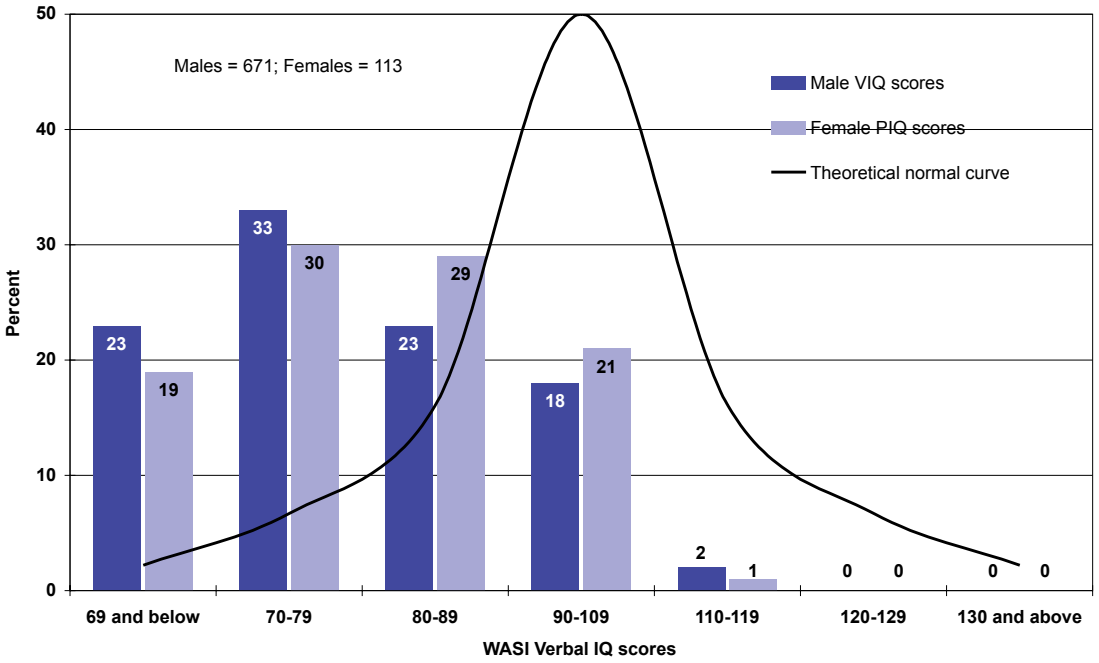
Using a culture fair IQ assessment protocol, 34% young offenders scored in the average range on the WASI

The mean FSIQ score of 83 fell within the low average range

The mean VIQ score of 79 fell in the borderline range

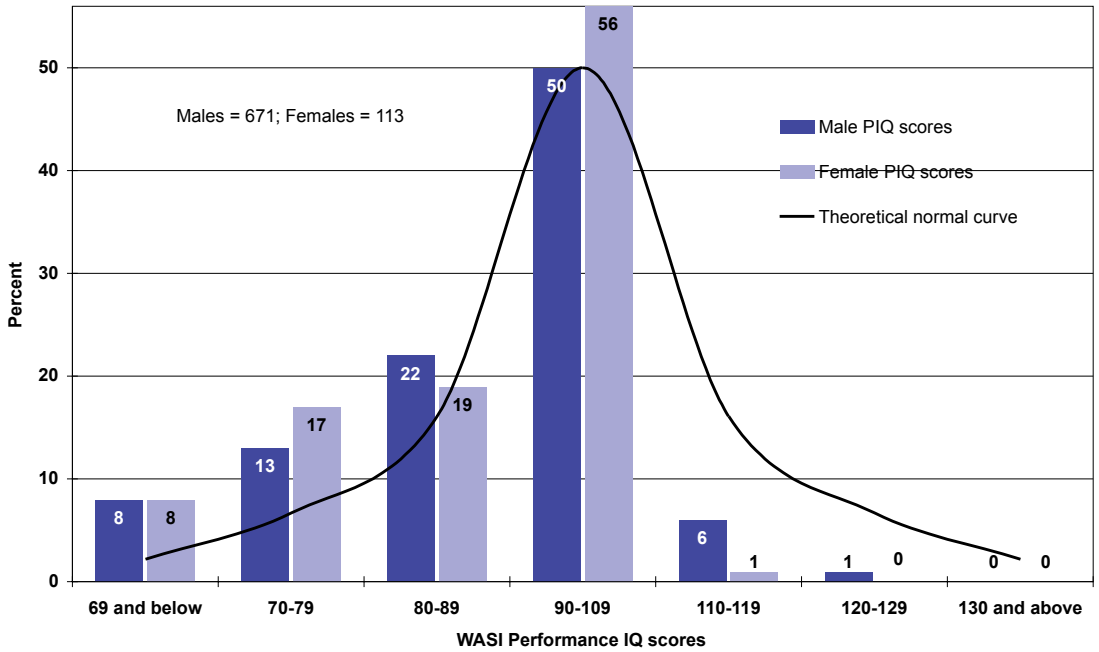
The mean PIQ score of 91 fell in the average range

Figure 6.4 WASI Verbal IQ scale scores by gender (%)



18% males and 21% females scored in the average range on WASI verbal IQ scale

Figure 6.5 WASI Performance IQ scale scores (%)



50% males and 56% females scored in the average range on WASI Performance IQ scale

Young offenders indicated a high level of disengagement with the educational environment from an early age

6.2 Education

6.2.1 Educational history

Young offenders are at very high risk of experiencing academic and social problems in school. Most available studies report significant deficits in the basic academic skills of reading, language, and mathematics.[7] Other studies also report that low educational achievement contributes to the prediction of recidivism.[8] One study reported that 36% of their sample of 202 young offenders aged 12-18 years had been suspended from school at least five times and 64% had been expelled at least once.[9]

Young offenders indicated a high level of disengagement with the educational environment from an early age (Table 6.2).

The majority had left school without achieving a minimal qualification, had not regularly attended school, and had been suspended on numerous occasions.

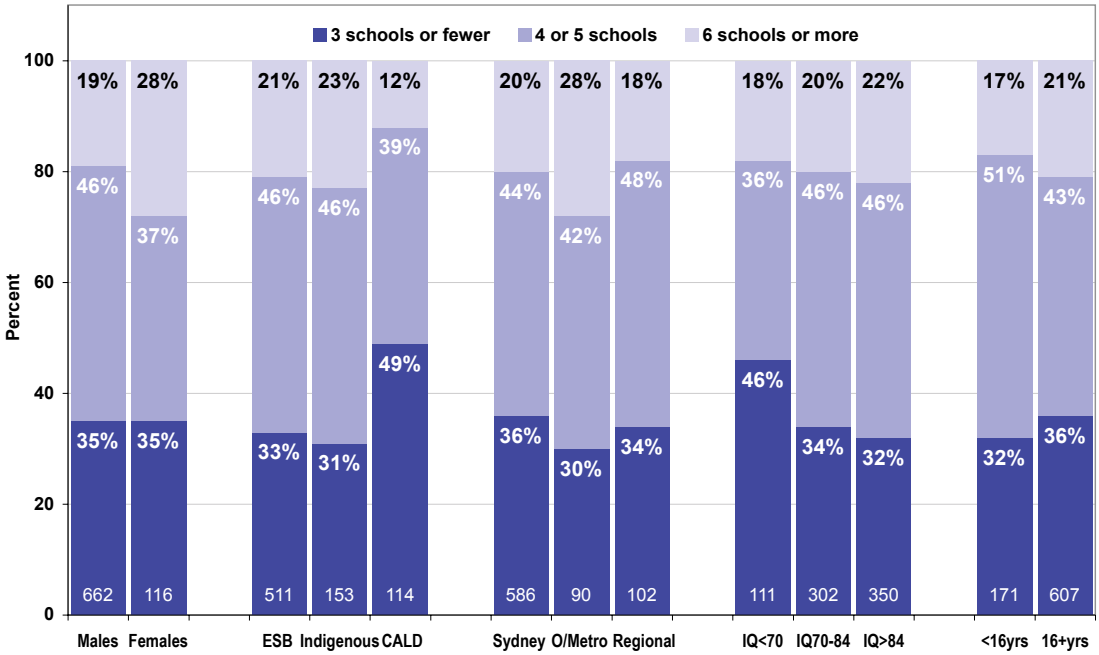
Table 6.2 Educational history (%)

Educational history*	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
Mean age left school (years)[i]	15.0	14.5	14.5	14.6	14.9	14.5
Not attending school [i]	82	81	84	83	82	82
- left school before Year 7[ii]	2	1	1	0	2	1
- left school in Year 7 [ii]	7	16	6	20	7	16
- left school in Year 8 [ii]	15	24	16	33	15	25
- left school in Year 9 [ii]	31	34	43	20	32	33
- left school in Year 10 [ii]	30	16	27	27	30	17
- left school in Year 11 [ii]	11	8	4	0	10	7
- left school in Year 12 [ii]	5	1	3	0	5	1
Skip/skipped school regularly[i]	59	n/r	69	n/r	60	n/r
Suspended from school[i]	90	90	85	100	89	91
History of special education[i]	37	39	32	50	36	40

a (i) Males=673, Females=118, Total=791; (ii) M=551, F=97, T=648; b M=156-209; F=12-18; T=168-227;
^ Special school or class, tutorial centre, or alternative community based program; *[YPiCHS: before custody]

School mobility (Figure 6.6) refers to "changes in school enrolment at times other than those prompted by school or program design"[10] (eg changing schools but not graduating to high school). Research into the effects of mobility is inconclusive; however, Henderson (2002)[11] lists potential negative impacts including disrupted social and academic development,[12,13] lower achievement,[14] delayed grade progression,[15] and dropout.[16] Young offenders with a history of out of home care (OOHC) were more likely to have attended six or more schools; those with no OOHC were more likely to have attended three or fewer schools.

Figure 6.6 School mobility (categories) by gender, ethnicity, region, IQ and age (%)



Most young offenders had left school without achieving a minimal qualification, had not regularly attended school, and had been suspended on numerous occasions

20% young offenders had attended 6 or more schools

Young offenders with a history of out of home care (OOHC) were more likely to have attended six or more schools; those with no OOHC were more likely to have attended three or fewer schools

6.3 Academic Achievement

The Composite Standard Score on the *Wechsler Individual Achievement Test-II-Abbreviated* (WIAT-II-A) provides an estimate of overall academic achievement in reading, spelling and mathematics.[17] The WIAT-II-A is based on a normative sample with an average score of 100 and standard deviation of 15, the normal distribution curve for which is superimposed on FIgures 6.7-6.9 for comparison with the young offender sample.

Table 6.3 presents WIAT-II-A subtest scores for both community orders and custody samples.

Table 6.3 WIAT-II-A subtest scores for community orders and custody samples (%)

Subscales	Males		Females		Total	
	Community[a]	Custody[b]	Community[a]	Custody[b]	Community[a]	Custody[b]
WIAT Numerical operations						
Intellectually disabled (<70)	63	62	69	89	64	64
Borderline (70-79)	21	21	22	0	21	19
Low average (80-89)	9	9	9	5	9	9
Average (90-109)	6	7	0	5	5	7
High average (110-119)	1	1	0	0	1	1
Superior (IQ 120-129)	<1	0	0	0	0	0
Very superior (IQ>129)	0	0	0	0	0	0
WIAT-II-A Spelling subtest						
Intellectually disabled (I<70)	23	30	9	17	21	30
Borderline (70-79)	17	21	16	17	17	20
Low average (80-89)	20	16	20	22	20	17
Average (90-109)	35	29	52	44	37	31
High average (110-119)	5	3	3	0	4	2
Superior (IQ 120-129)	1	0	0	0	1	0
Very superior (IQ>129)	0	0	0	0	0	0
WIAT-II-A Word Reading subtest						
Intellectually disabled (<70)	22	31	17	11	21	28
Borderline (70-79)	17	12	17	11	17	12
Low average (80-89)	18	17	18	17	18	18
Average (90-109)	37	34	46	39	39	34
High average (110-119)	5	6	2	17	5	7
Superior (IQ 120-129)	0	1	0	6	0	1
Very superior (IQ>129)	0	0	0	0	0	0

a (i) Males= 666-8, Females= 115-7, Total= 783-4; b M= 194-7; F= 18-19; T= 212-6

85% young offenders scored in the borderline range or lower for numerical operations

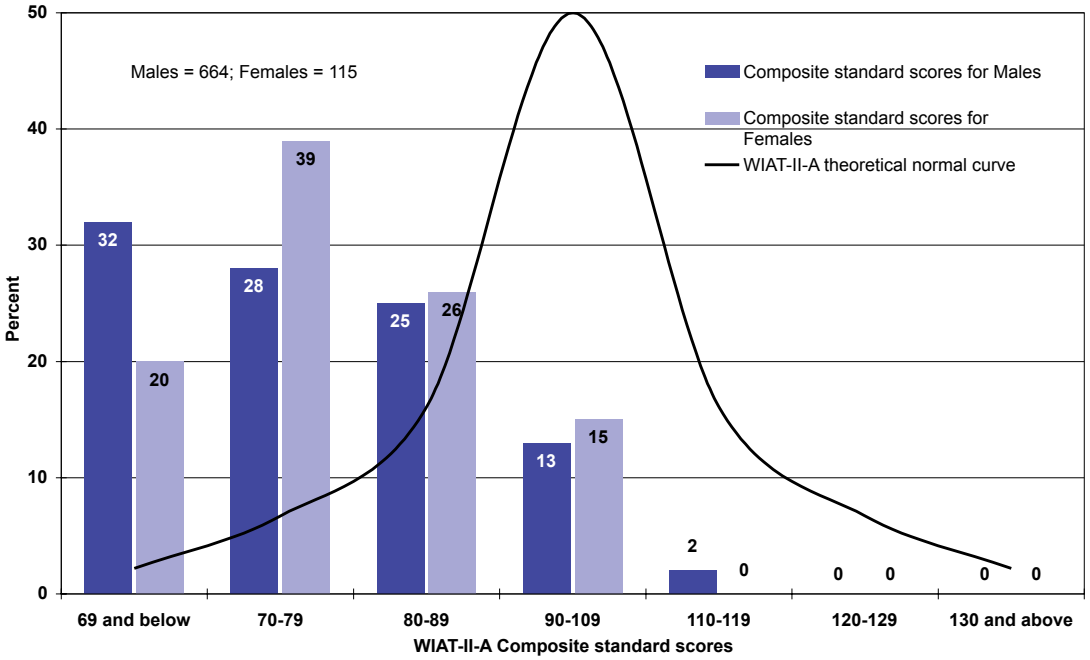
38% young offenders scored in the borderline range or lower for spelling achievement

38% young offenders scored in the borderline range or lower for word reading

13% scored in the average range (90-109) on the Composite Standard Score of the WIAT-II-A

Figure 6.7 displays WIAT-II-A composite standard scores for males and females.

Figure 6.7 WIAT-II-A composite standard scores (%)



Average overall academic performance fell within the borderline range. The average WIAT-II-A Composite Standard Score (CSS) was 77 (range 46 to 118), indicating that young offenders on community orders fell well below (1.5 standard deviations, on average) the expected norms in terms of their overall academic achievement. Thirty percent (30%) of young offenders scored <70 on the Composite Standard Score.

ESB young offenders were less likely and Aboriginal young offenders were more likely to score in the range for intellectual disability (<70) on the WIAT-II-A CSS. Aboriginal young offenders were also less likely to score in the ranges 70-84 and >84 than expected; ESB were more likely to score in those ranges while CALD had the expected distribution across the three score ranges for CSS.

Young offenders from the metropolitan areas were less likely and regional young offenders were more likely to achieve scores <70 on CSS.

As expected, those young offenders with IQ<70 were more likely to achieve a CSS <70 and more young offenders with IQ>84 were likely to achieve a CSS>84.

6.3.1 Numerical ability, spelling and word reading subtest scores

Sixty-two percent (62%; n=482) [YPiCHS 60%, n=128] could read at a low average or better standard; 62% (486) [YPiCHS 50%, n=105] were able to spell at a low average or better standard, but only 15% (116) [YPiCHS 16%, n=35] could perform numerical operations at a low average standard or better. The following percentages of young offenders on community orders attained the WIAT-II-A subtest scores consistent with performance in the intellectually disabled range:

- 30% (234) composite standard scores;
- 64% (501) numerical operations subtest;
- 21% (168) word reading subtest;
- 21% (163) spelling subtest.

Figure 6.8 shows the distribution of scores on the numerical operations subtest for male and female offenders.

30% young offenders scored <70 (i.e. in the intellectually disabled range) on the Composite Standard Score of the WIAT-II-A CSS

Aboriginal young offenders were more likely to score in the intellectually disabled range (<70) on the WIAT-II-A CSS

62% young offenders could read and spell at a low average or better standard but only 15% could perform numerical operations at low average or better standard

Figure 6.8 WIAT-II-A numerical operations standard scores (%)

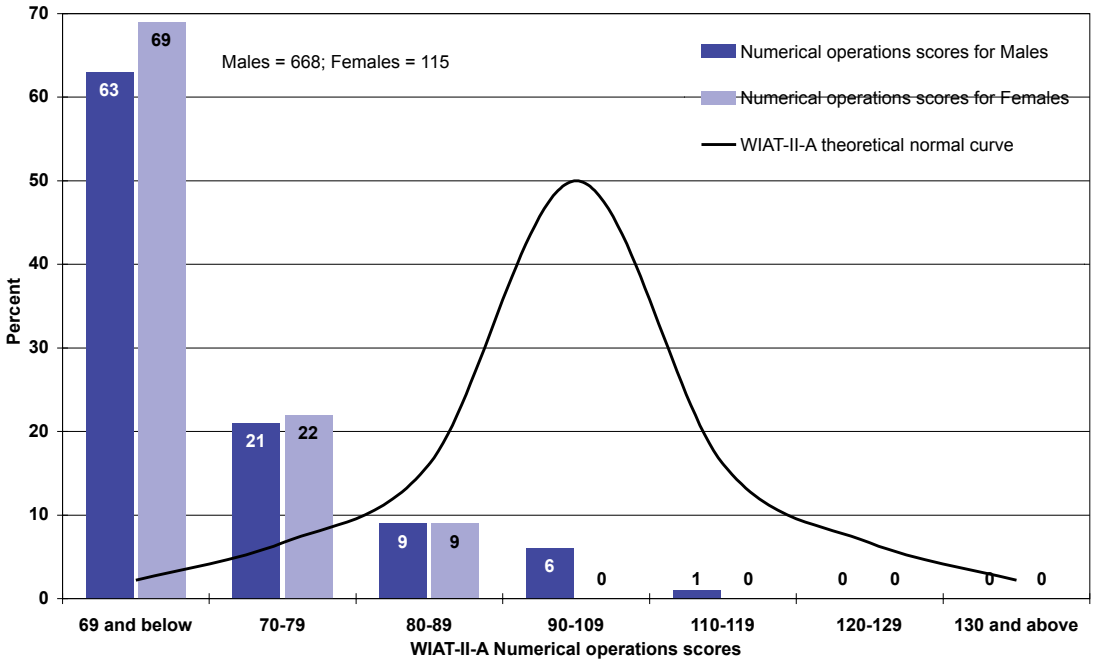


Figure 6.9 (overleaf) shows the distribution of scores on the spelling subtest for both samples.

Figure 6.9 WIAT-II-A spelling standard scores (%)

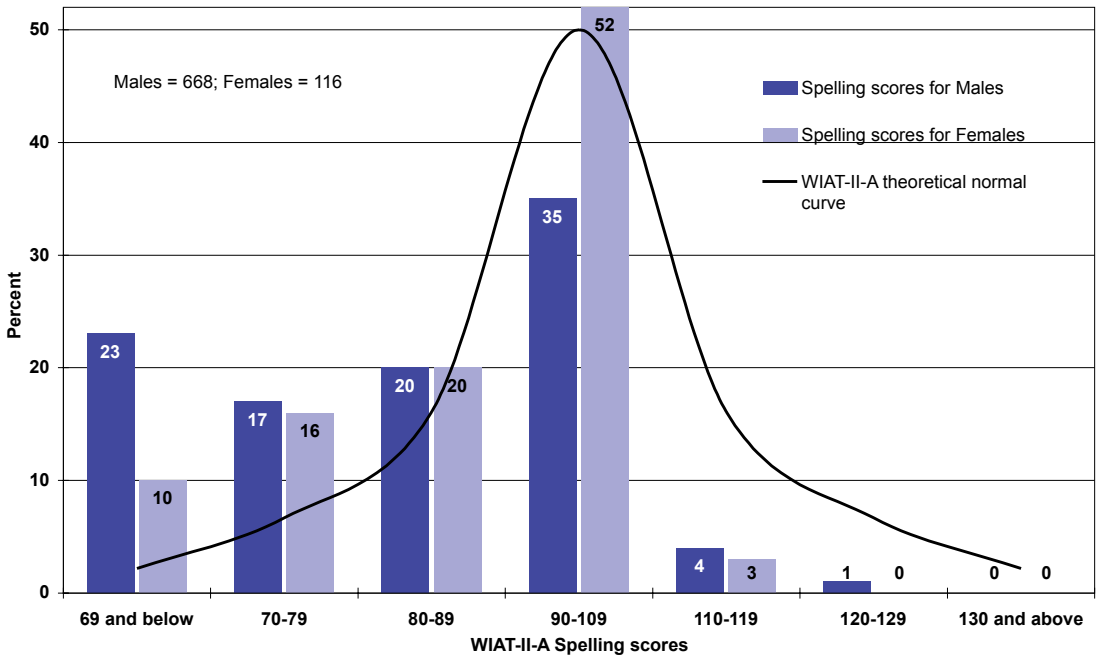
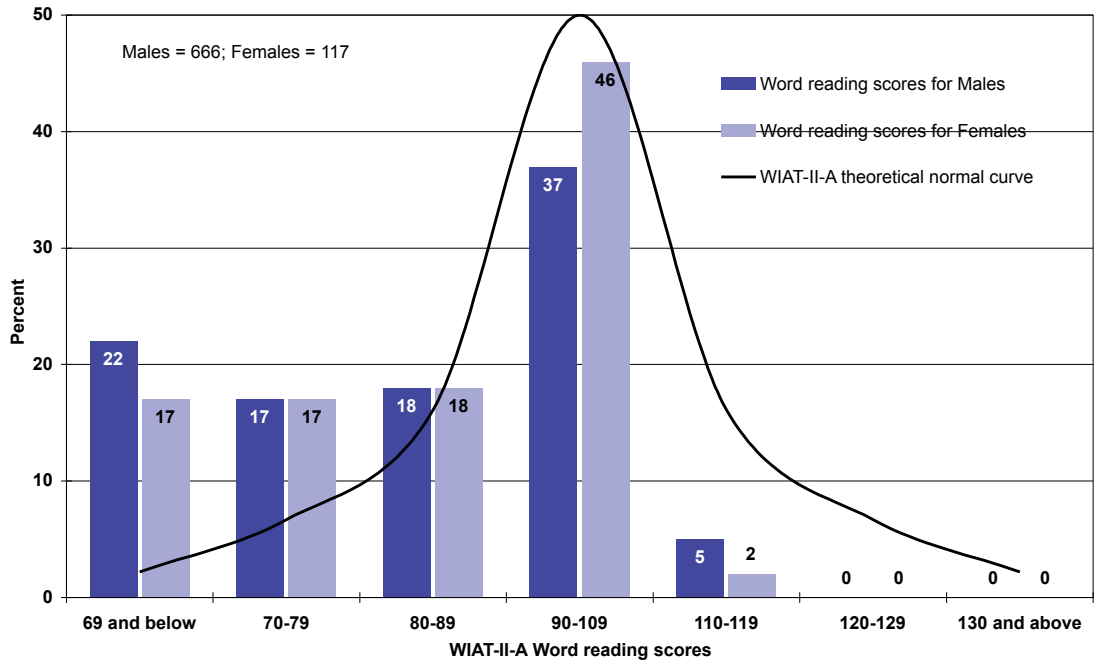


Figure 6.10 shows the distribution of scores on the word reading subtest for males and females with the normative curve from the standardisation sample.

Figure 6.10 WIAT-II-A word reading standard scores (%)



Young offenders attained WIAT-II-A subscale scores consistent with performance in the intellectually disabled range:

- *30% Composite Standard Scores*
- *64% Numerical Operations*
- *21% Word Reading*
- *21% Spelling*

6.4 Intellectual disability estimates

Intellectual disability is defined as an individual's level of intellectual functioning and its impact on ability to perform a range of cognitive and behavioural tasks required for independent living. An individual is usually defined as intellectually disabled if he or she has an overall intellectual quotient <70 (two standard deviations below the mean) of a reliable test of intelligence (mean=100; SD=15), such as the *Wechsler Intelligence Scale for Children*, along with functional impairments in

two of the behavioural domains that impact on adaptive functioning.[17] These domains include communication, educational achievement, self-care and interpersonal skills. Intellectual disability is normally identified before the age of 18 years and is usually present from birth.[18]

The WASI assesses cognitive functioning, and the WIAT-II-A assesses one area of adaptive functioning, that of functional academic skills (two areas of adaptive functioning are required for a formal diagnosis – only one was available for this study).

Developmental disability and neurological dysfunction create problems in executive and adaptive function.[19] Young offenders with a developmental disability are usually unable to develop meta-cognitive skills, that is, the capacity for awareness and insight into their own thinking processes. Such failures in cognitive development and adaptive function (problem-solving, impulse control) are more likely to lead to behaviours that result in the commission of an offence.

As a special needs group, intellectually disabled offenders present unique challenges to Departments of Juvenile Justice, especially in relation to their identification, assessment, case management, rehabilitation needs and post release adjustment. It is more challenging for offenders with an intellectual disability to learn new adaptive behaviours and harder for them to unlearn maladaptive behaviours than other offenders. Consequently, more intensive interventions may be required than for offenders with average intellectual functioning. Having an intellectual disability can also predispose an individual to other behavioural problems and increase the probability of dual diagnosis presentations.

The *Young People in Custody Health Survey*[20] found that 13% of juvenile offenders surveyed met the criteria for intellectual disability where adaptive functioning was measured by academic performance. Culture fair testing estimated that 10% of Aboriginal and CALD offenders also met these criteria.

For young offenders in the community, 15% (n=119) WASI Full Scale IQ scores fell into the range consistent with intellectual disability (i.e., <70). Eleven percent (11%; n=87) scored <70 on both the WASI Full Scale IQ and the WIAT-II-A Composite Standard Score (WIAT-CSS). This indicates that 11% young offenders on community orders may have an intellectual disability, at least in relation to their adaptation to mainstream Anglo-Australian society.

To understand a person's educational and adaptive needs, the normative standards of the dominant cultural group are important.[21] However, to diagnose intellectual disability in a culture-fair manner, it is important to compare IQ and adaptive behaviour with those of a person's cultural group. Since the WASI and WIAT-II-A sample comprised Aboriginal (19.5%; n=148) and CALD young offenders (15%; n=112) (Note: in YPoCOHS, CALD was coded for those with a language other than English mainly spoken in the home), these results require careful interpretation because these young offenders would be expected to have lower verbal scores than those from an English-speaking background (ESB).

6.4.1 Culture fair assessment of intellectual disability

Indigenous performance on the non-verbal (Performance) scales on IQ tests are more likely to be comparable to available Australian norms, particularly for those raised in urban areas.[20] One 'culture fair' estimate of IQ could be based on numbers of Aboriginal and CALD young offenders scoring <70 on the WASI Performance IQ Scale, and the number of ESB young offenders with a WASI Full Scale IQ<70. Twenty-four Aboriginal and seven CALD young offenders scored <70 on the Performance IQ Scale, and 64 young ESB offenders scored <70 on the WASI Full Scale IQ. Hence, 12% (95) young offenders have culture fair IQ scores <70.

Two thirds (64) of those young offenders with culture-fair IQ scores (i.e. WASI PIQ for CALD/Aboriginal groups) <70 also had WIAT-CSS scores <70. This combined assessment of adaptive functioning and culture fair IQ provides a valid culture fair measure of intellectual disability at 8%, n=64.

Several clients who refused to continue on the WASI may have done so to avoid the anxiety and perceived shame of being unable to

People with an intellectual disability are usually unable to develop meta-cognitive abilities, that is, the capacity for awareness and insight into their own thinking processes

It is more challenging for people with an intellectual disability to learn new adaptive behaviours and harder for them to unlearn maladaptive behaviours

15% young offenders' WASI Full Scale IQ scores fell into the range consistent with intellectual disability

complete the required tasks. This would suggest that 8% may be an underestimate of the true level of intellectual disability in this group. Further, although strict criteria were applied to identify caseness for ID in this report, many of the young offenders scoring in the borderline ranges for IQ and/or educational achievement would share many of the characteristics and deficits specifically identified in young people meeting criteria for ID and should therefore be offered similar interventions as those meeting the criteria for ID.

6.4.2 Relationships between intellectual disability, Aboriginal status and offending

Neurobiological dysfunction, lower verbal ability,[8,22,23] lack of metacognitive skills, poor capacity to problem solve, high levels of impulsivity and emotional dysregulation, [21,24] and social skills deficits[25,26] have all been observed more frequently in people with an intellectual disability, and these characteristics are thought to increase the risk of offending and hence explain the relationship between ID and offending. Specifically, social skills deficits have been hypothesised to account for higher rates of person-focused offending (violent and sex offences) in young offenders with an intellectual disability.[27,28]

Court outcomes for offences and offence types were compared for ID and nonID young offenders and results are presented in Table 6.4.

11% scored <70 on both the WASI Full Scale IQ and the WIAT-II-A Composite Standard Score (WIAT-CSS)

At least 11% of young offenders on community orders have an intellectual disability

12% young offenders had culture fair IQ<70

8% had both a culture fair IQ and WIAT-II-A CSS in the range for intellectual disability

8% may be an underestimate of the true level of intellectual disability in this group

Table 6.4 Court outcomes for offences and offence types by ID status (%)

Offence/court determination	ID category	N	Mean	SD	P-value
Number of court dates	<70	119	5.03	4.58	0.000
	>69	657	3.51	3.24	
	Total	776	3.74	3.52	
Recorded offences	<70	119	6.14	6.06	0.024
	>69	657	4.85	5.65	
	Total	776	5.05	5.73	
Bond, probation, CSO, suspended, z-rec	<70	109	5.32	4.61	0.054
	>69	567	4.46	4.18	
	Total	676	4.60	4.26	
Supervised orders	<70	109	4.33	4.26	0.069
	>69	567	3.61	3.66	
	Total	676	3.73	3.77	
Control orders	<70	109	0.67	2.12	0.372
	>69	567	0.49	1.93	
	Total	676	0.52	1.96	
Violent offences	<70	109	1.66	2.12	0.691
	>69	567	1.74	1.99	
	Total	676	1.73	2.01	
Property offences	<70	37	3.86	3.98	0.048
	>69	141	2.75	2.72	
	Total	178	2.98	3.05	
Traffic offences	<70	37	0.86	1.49	0.902
	>69	142	0.90	1.63	
	Total	179	0.89	1.60	

* Sample size too small to conduct statistical analysis

There were significant differences between ID and nonID young offenders on four of the offence factors assessed. ID young offenders had significantly more court dates and recorded offences than nonID offenders. They also received more bonds, probations etc than nonID offenders but there were no differences between the ID groups with respect to orders with supervision and control orders. ID young offenders committed more property offences but there were no differences between IQ categories with respect to violent offences or traffic offences.

Using ANOVA with post hoc comparisons, a further breakdown of the same factors by Aboriginal and ID status showed that non-Aboriginal non-ID offenders had fewer court dates, fewer recorded offences, fewer bonds, fewer supervised orders and fewer control orders than the other three groups. However, there were no differences between the four groups with respect to the number of violent, property or traffic offences committed (Table 6.5).

Table 6.5 Number of court dates, court outcomes and offence types by Indigenous and ID status (%)

Court outcomes and offences	Group	N	Mean	SD	P-value
Number of court dates	Indig_ID	77	4.90	4.40	0.000
	nIndig_ID	552	3.20	2.99	
	Indig_nID	42	5.26	4.92	
	nIndig_nID	105	5.10	3.98	
	Total	776	3.74	3.52	
Recorded offences	Indig_ID	77	6.35	6.15	0.000
	nIndig_ID	552	4.46	5.37	
	Indig_nID	42	5.76	5.93	
	nIndig_nID	105	6.92	6.59	
	Total	776	5.05	5.73	
Bond, probation, CSO, suspended, z-reco	Indig_ID	72	5.33	4.73	0.002
	nIndig_ID	472	4.20	4.10	
	Indig_nID	37	5.30	4.43	
	nIndig_nID	95	5.77	4.31	
	Total	676	4.60	4.26	
Supervised orders	Indig_ID	72	4.31	4.33	0.002
	nIndig_ID	472	3.38	3.56	
	Indig_nID	37	4.38	4.18	
	nIndig_nID	95	4.79	3.97	
	Total	676	3.73	3.77	
Control orders	Indig_ID	72	0.78	2.18	0.019
	nIndig_ID	472	0.38	1.69	
	Indig_nID	37	0.46	2.01	
	nIndig_nID	95	1.02	2.77	
	Total	676	0.52	1.96	
Violent offences	Indig_ID	72	1.85	2.37	0.087
	nIndig_ID	472	1.66	1.93	
	Indig_nID	37	1.30	1.49	
	nIndig_nID	95	2.15	2.25	
	Total	676	1.73	2.01	
Property offences	Indig_ID	24	3.92	4.28	0.129
	nIndig_ID	115	2.59	2.61	
	Indig_nID	13	3.77	3.52	
	nIndig_nID	26	3.46	3.13	
	Total	178	2.98	3.05	
Traffic offences	Indig_ID	24	1.17	1.69	0.481
	nIndig_ID	116	0.89	1.57	
	Indig_nID	13	0.31	0.85	
	nIndig_nID	26	0.96	1.93	
	Total	179	0.89	1.60	

Those with an IQ<70 had more recorded offences

There were no differences between ID and nonID offenders in court outcome

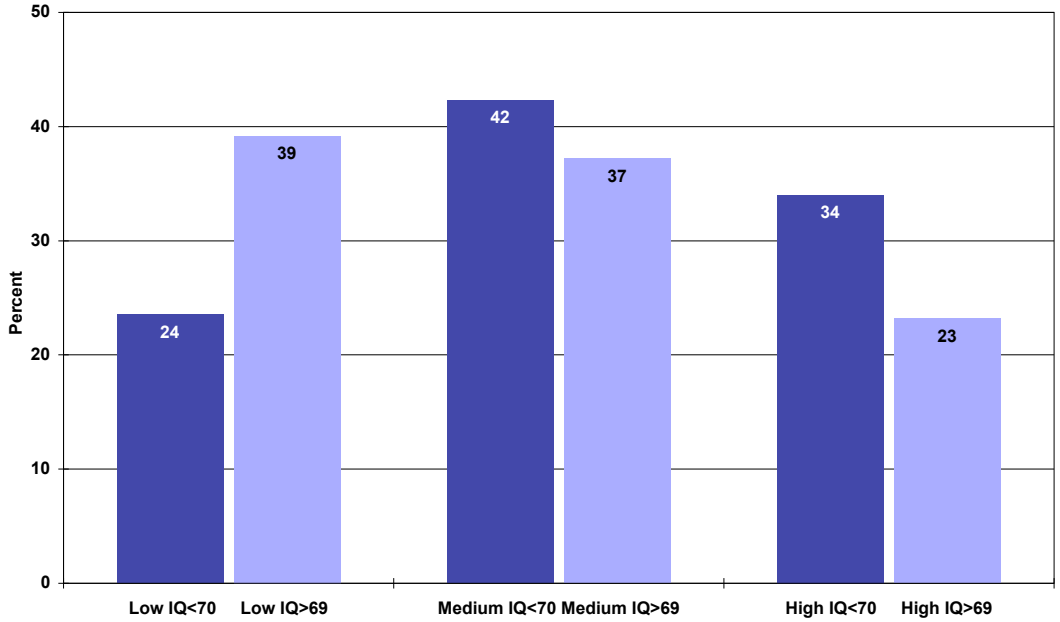
Non-Aboriginal ID young offenders had fewer court dates and fewer recorded offences than Aboriginal ID young offenders

ID young offenders were rated 'medium risk' on the YLSI-AA and non ID young offenders were rated 'low risk'

6.4.3 Relationship between Youth Level of Service/Case Management Inventory: Australian Adaptation, (YLS/CMI:AA) and intellectual disability

On average, those with an IQ<70 scored in the 'Medium Risk' category and those with an IQ>69 scored in the 'Low Risk' category on the YLS/CMI:AA. Those with an IQ <70 scored higher on: 'Prior and current offences'; 'Peer Relations'; 'Education and Employment'; 'Leisure and Recreation'; and 'Attitudes and Orientation', but lower than IQ>69 on the 'Substance Use' domain (Figure 6.11 overleaf).

Figure 6.11 Relationship between YLSI risk level and IQ (%)



Aboriginal offenders may be at higher risk of recidivism

ID young offenders have more needs relating to peers, leisure, education, employment and attitudes

Social skills deficits are an important criminogenic need for ID young offenders

A further assessment of the relationships between YLSI, age and number of court appearances by Aboriginal and ID status was conducted. Table 6.6 shows the domain scores on the YLSI:AA for Aboriginal and non-Aboriginal young offenders.

Table 6.6 Age, YLS/CMI:AA and number of court dates by IQ and Indigenous status (%)

	IQ range (<70 and >69)	N	Indigenous	Mean	SD
AGE	<70	73	No	16y 11m	1.2
		39	Yes	16y 2m	1.3
		112	Total	16y 8m	1.3
	>69	510	No	17y 1m	1.2
		102	Yes	16y 9m	1.3
		612	Total	17y 1m	1.3
	Total	583	No	17y 1m	1.2
		141	Yes	16y 7m	1.3
		724	Total	17y 0m	1.3
YLS/CMI:AA: Total risk & needs score	<70	73	No	18.47	8.5
		39	Yes	21.08	8.6
		112	Total	19.38	8.6
	>69	510	No	15.97	9.3
		102	Yes	19.55	8.8
		612	Total	16.57	9.3
	Total	583	No	16.28	9.3
		141	Yes	19.97	8.8
		724	Total	17.00	9.3
Number of court dates (excluding court dates for abuse)	<70	73	No	4.77	4.1
		39	Yes	4.92	3.6
		112	Total	4.82	3.9
	>69	510	No	3.22	2.8
		102	Yes	5.20	4.0
		612	Total	3.55	3.1
	Total	583	No	3.41	3.0
		141	Yes	5.12	3.9
		724	Total	3.74	3.3

The MANOVA (multivariate analysis of variance) shows significant differences for both ID [Wilks lambda=0.981; F (3,718)=4.7, p=.003] and Aboriginal [Wilks lambda=0.961; F (3,718)=9.68, p < .001] groups but no interaction between Aboriginality and ID. Significant differences between those with an IQ>69 and IQ<70 were found for age (ID were younger) (p=.003) and YLS/CMI: AA total scores (ID had higher scores) (p=.05). Significant differences between those identified as Aboriginal and non-Aboriginal were found for age (Aboriginal were younger) (p=.000), YLS/CMI: AA total scores (Aboriginal had higher scores) (p=.003) and number of court dates (Aboriginal had more court appearances) (p=.003). Analysis of the interaction revealed only one significant effect, for number of court dates (Aboriginal non-ID had more court dates than non-Aboriginal non-ID (p=.011) but number of court dates for Aboriginal and non-Aboriginal ID were the same).

Figures 6.12 to 6.14 present these findings graphically for ease of interpretation.

Figure 6.13 YLSI by IQ for Indigenous and non Indigenous offenders (%)

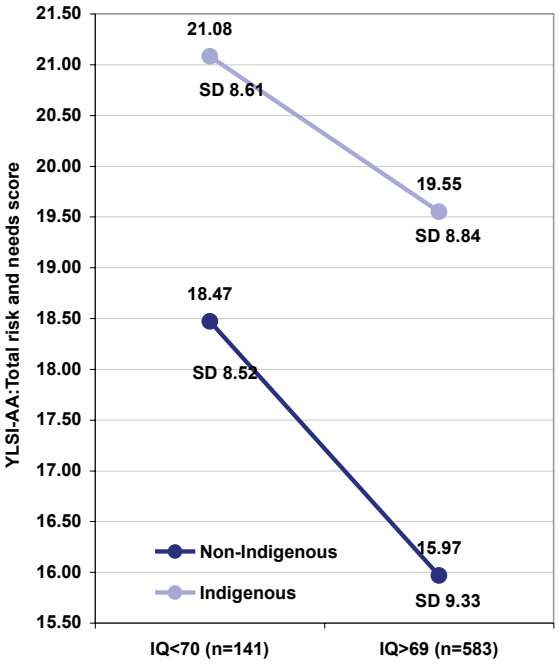


Figure 6.12 Age by IQ for Indigenous and non Indigenous offenders (%)

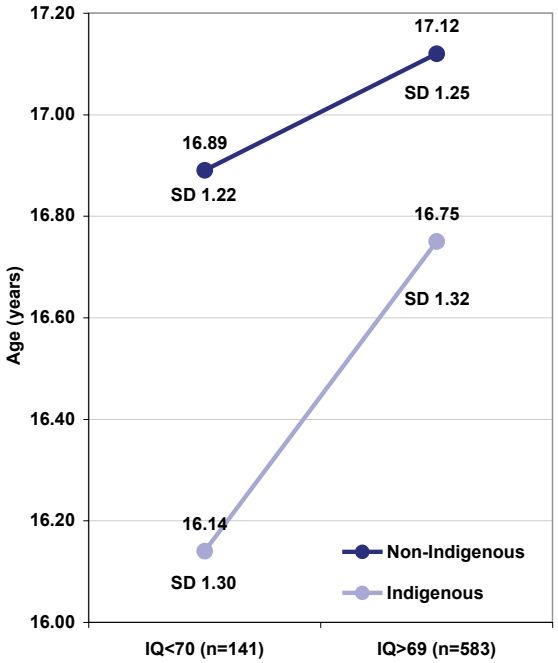
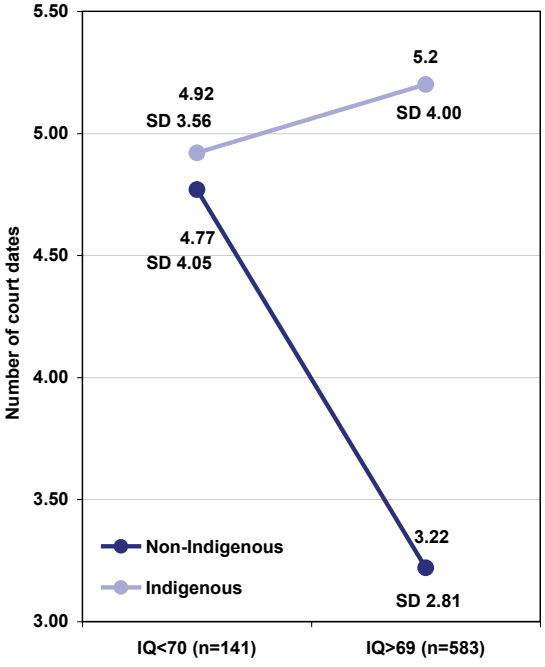


Figure 6.14 Court dates by IQ for Indigenous and non Indigenous offenders (%)



Young offenders with ID (IQ<70) had a greater risk of re-offending

Aboriginal offenders were younger and had more court appearances than non-Aboriginal offenders

Aboriginal non-ID offenders had more court dates than non-Aboriginal non-ID offenders

6.5 Summary and conclusions

The mean Full Scale IQ score of 83 fell within the low average range. The mean Verbal IQ score of 73 fell within the borderline range; the mean Performance IQ of 91 fell within the average range. Fifteen percent (15%) young offenders had Full Scale IQ (WASI) <70, placing them in the category of intellectual disability; 23% had Verbal IQ<70 compared with 8% who had Performance IQ<70. An additional 27% had Full Scale IQs in the range 70-79 (Borderline). Therefore, 42% young offenders on community orders were functioning in the borderline range of intellectual functioning or lower. The pattern of scores was similar for the custody sample, although there were more young offenders in custody who scored in the range of intellectual disability. Twelve percent (12%) had a culture fair IQ that fell in the range of intellectual disability. Eight percent (8%) had scores on both WASI and WIAT tests that fell within this range.

42% young offenders' intellectual functioning fell within the borderline range or lower

Young offenders indicated a very high level of disengagement with the school environment from an early age. Most had left school without achieving a minimal educational qualification (Year 10 School Certificate). Most had been suspended from school. Educational testing using the WIAT-II-A showed that the average overall academic performance fell within the borderline range (average WIAT CSS=77); 30% scored <70 on WIAT CSS. Many young offenders had not achieved a basic standard of literacy or numeracy; 64% scored in the range of intellectual disability for numerical operations and 21% for each of word reading and spelling scored in this range. Aboriginal young offenders were more likely to score in the intellectually disabled range.

ID young offenders need to be identified early and receive targeted interventions to ensure maximum rehabilitative benefit from their supervision

Participants with an IQ <70 had higher scores (ie higher criminogenic needs) on the YLS/CMI:AA than those with an IQ >69 and were placed in a higher category of risk on the YLS/CMI:AA (Medium v Low). According to the principles of RNR (risk, needs and responsivity) these findings suggest that those with an IQ <70 have a greater risk of re-offending. Recent meta-analytic studies indicate that ID is a risk factor for recidivism in juveniles.[29,30] These results have implications for juvenile justice services. The Department of Juvenile Justice in NSW determines frequency of contact of those on community orders according to risk, with high risk young offenders receiving more contact. As those with an ID are more likely to be in higher risk categories, juvenile justice officers are likely to spend a large amount of time engaging with juvenile offenders with an ID. Juvenile Justice Officers should therefore be trained to recognise possible ID in young offenders, refer for assessment and to interact appropriately with this group of young offenders to ensure maximum rehabilitative benefit of their supervision.

There may be an interaction between offence type, ID status and risk categorisation on YLSI that requires further exploration

The finding that those with an ID had higher YLS/CMI:AA scores must be considered with caution. The percentage of those with and without an ID in categories of 'Low', 'Medium' and 'High' risk appeared different for different offences, including 'Break and Enter' and 'AVO'. This suggests a possible interaction between offence type, ID status and risk categorisation that requires further exploration. The significance of the relationship between higher YLS/CMI:AA risk category and ID was also affected by Aboriginal status. Aboriginal young offenders were more likely to be in a higher risk category on the YLS/CMI:AA than non-Aboriginal young offenders. This finding supports previous research in Australia that indicates that Aboriginal offenders are at particularly high risk of recidivism.[31,32] Whilst no interaction effect was found between ID and Aboriginal status for YLS/CMI:AA score, when separate analyses were conducted for Aboriginal and non-Aboriginal offenders with respect to ID status and YLS/CMI:AA risk classification, those with an ID were only found to be at higher risk of being allocated to a higher risk category when participants were not Aboriginal. This is consistent with previous research suggesting that although ID is a significant risk factor for recidivism, the relationship may be indirect due to ID's relationship with other factors that have been found to be more proximal with offending.

Social skills deficits are an important criminogenic need for those with an ID

Those with an ID had a different profile of needs compared with those without an ID. Higher needs for the ID group included domains relating to peers, leisure, education, employment and attitudes. This domain profile

strongly reflects the heightened social needs of those with an ID compared with young offenders without an ID. These findings are also consistent with the hypothesis that social skills deficits are an important criminogenic need for those with an ID.[25,26]

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