Changes in heterosexual university undergraduates' HIV-related knowledge, attitudes and behaviour: Melbourne, 1989-1994

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Objective: To examine differences in the AIDS-related knowledge, attitudes and behaviours of first year university undergraduates in 1989 and 1994.

Design: Comparisons were made between cross-sectional surveys, conducted in 1989 and 1994, of first year undergraduates at three Melbourne universities.

Results: The 1994 cohort reported more positive attitudes toward, and better knowledge of, safe sex practices and less discrimination against perceived risk groups than did the 1989 cohort; however, this was due primarily to improvement among female undergraduates. Male undergraduates either demonstrated no improvement or a decline in pro-safe sex attitudes. A general increase was found in the proportion of respondents always using condoms for vaginal sex with casual and regular partners and for oral sex with casual and regular partners.

Conclusions: While the extent of sexual behaviour among these young people has remained essentially unchanged over the past five years, the extent of self-reported condom use has increased markedly. The general decline in attitudinal measures among young men contrasts with a marked improvement among young women and suggests the need for education programs targeted specifically at this group.

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Introduction

Sequential surveys of HIV/AIDS-related knowledge, attitudes and behaviour can be an effective method for monitoring the impact of HIV/AIDS education campaigns on specific populations. Such studies can be used to monitor not only the general patterns of change over time, but can provide critical insights into the differential uptake of educational messages and allow fine-tuning of educational strategies or offer evidence of the need for new or different approaches. The value of such studies is in part demonstrated through the significant role they played in the recent evaluation of the Australian National HIV/AIDS Strategy.¹

Condom use has been the focus of a number of these studies, one of which found that condom use among college students in the United States increased from 18% in 1974 to 28% in 1991.² Over a shorter time frame, reported condom use in most recent intercourse rose from 15% in 1982 to 39% in 1992 in a similar sample³ and mirrors the increased prevalence of more positive attitudes towards condoms.⁴ In a more detailed, longitudinal study of 15 to 19 year old adolescent males over the period 1988-1991, condom use was found to decline as the cohort aged, but condom use was unchanged among same-aged males at different time points.⁵ A study of 18-25 year olds in Scotland over the period 1988-1993 found that condom use among males increased from 36% to 57% and among females from 22% to 41%.⁶

In Australia the ongoing survey of undergraduates at one Sydney university have shown little change between 1988 and 1993 in

reported levels of oral, anal, and vaginal sexual practice among young people.⁷ However, condom use for vaginal sex with regular (but not casual) partners increased significantly over that period. McCamish⁸ also found little change in the levels of sexual activity between 1989 and 1992, although the male first-year university students in that sample showed a steady decrease in the levels of activity. Condom use was not examined. Level of knowledge about HIV was high in 1989 and did not vary over time or across the sexes.

In the present study we extend previous work by including an examination of changes in discriminatory attitudes and attitudes to HIV precautions. We report the HIV-related knowledge, attitudes and behaviours of two samples of first year university undergraduates—one sample from 1989 and the second from 1994. Findings from the 1989 sample have been reported previously⁹⁻¹¹ and demonstrate relatively high levels of knowledge, moderately positive attitudes to condoms and discriminatory attitudes to groups perceived to be at risk of HIV, and high levels of sexual activity but inconsistent condom use. The objective of the present study was to identify changes over the intervening five years in the accuracy of HIV-related knowledge, positive attitudes to the adoption of personal strategies for the prevention of infection, the extent and safety of sexual practices with both regular and casual partners, and discriminatory attitudes towards particular groups in society which may be perceived as vulnerable to HIV infection.

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Methods

Recruitment In 1989, first year undergraduates at 14 Victorian higher education campuses were approached during class to complete an extensive questionnaire which dealt in part with HIV/AIDS-related knowledge, attitudes and behaviours. In 1994, students were approached in public places on five Melbourne metropolitan campuses that had been surveyed in 1989 and were invited to complete a 15-minute questionnaire. These campuses are now part of three universities.

Questionnaire The questionnaire used in 1989 was longer than the 1994 version and only the common elements subject to analysis will be described here. Additional to demographic information (table 1), the questionnaire included a 24-item scale of attitudes to AIDS precautions of established reliability and validity.⁹ This scale consists of four subscales, each of six items, which dealt with antiprecautions (such as *AIDS precautions are a nuisance—I couldn't be bothered taking any precautions*), the denial of risk of HIV infection (such as *I might get around to taking AIDS precautions one day but I haven't yet*), abrogation of responsibility for safe behaviour (for example *A person's sexual partner should be responsible for initiating the use of condoms*), and fatalism (such as *Life is full of risks and AIDS is just one example: if you don't*

take risks you don't have fun). Respondents marked each item on a four-point scale (1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree) and for analysis the average was computed for each of the four subscales where the respondent had completed at least five of the six items (table 2).

A 16-item AIDS knowledge scale^{10 11} included items such as *Someone could pass on AIDS while appearing very healthy* and *Women can't get AIDS through sexual intercourse*. Items were rated as "true", "false" or "don't know". For the purpose of analysis the percentage correct and the percentage marked "don't know" were calculated where the respondent had completed at least 12 of the 16 items.

A social avoidance scale asked the respondents whether they avoided social contact with members of particular groups which may be perceived to be particularly vulnerable to HIV infection (table 3), for example gay men and haemophiliacs, and the number of groups avoided by each individual was also computed.

Respondents were asked if they had ever engaged in any of the following with a regular or casual partner: vaginal sex, anal sex, oral sex and withdrawal (table 4). The definition of a casual partner was stated as someone with whom the respondent had had sex with once or infrequently and a regular partner was someone with whom the respondent had an exclusive sexual relationship. For each behaviour that they had engaged in, respondents were asked if they used condoms always, sometimes or never. For the purposes of analysis, their responses were coded as always and not always (table 5).

Analysis Data from the five campuses surveyed in both 1989 and 1994 and respondents who reported engaging only in heterosexual practices were subject to analysis. Comparison of the demographic characteristics of the samples was by contingency table analysis. Knowledge and attitude scales were subjected to analysis of variance. Logistic regression was used for the analysis of each of social avoidance items and for sexual behaviour. Logistic regression modelling was used to examine differences between cohorts in condom use for particular behaviours. Explanatory variables for all analyses were sex, age, living arrangements, cohort, institution and course of study. Alpha was set to 0.01 for all analyses.

Ethics Ethical clearance was obtained from

Table 1 Demographic characteristics of the samples by cohort

	1989 N = 804	1994 N = 894
Sex‡		
Female	76.7	68.7
Male	23.3	31.3
Age (years)†		
17	12.6	7.6
18	64.7	65.4
19	18.8	20.6
20	4.0	6.4
Living arrangements‡		
With parents	72.3	79.9
Hostel/college	17.4	5.7
Alone/shared/other/not specified	10.1	14.4
Course of study‡		
Arts/Education/Commerce/ Business/other	48.5	62.3
Science/Engineering	20.8	26.4
Medicine/Nursing/Paramedical	30.7	11.9
Institution‡		
A	9.8	42.2
B	51.6	34.8
C	38.6	23.0

*0.05 > p > 0.01; † 0.01 > p > 0.001; ‡ 0.001 > p.

Table 2 Mean responses on the attitudes to AIDS precaution scales and the percent of correct and don't know responses on the AIDS knowledge scale

	1989		1994		Main Effects		Interaction
	Females N = 601 Mean (SD)	Males N = 186 Mean (SD)	Females N = 595 Mean (SD)	Males N = 273 Mean (SD)	Sex F _(1 1594)	Cohort F _(1 1594)	Sex × Cohort F _(1 1594)
Attitudes AIDS precautions							
Abrogation of responsibility	5.6 (2.7)	6.1 (2.7)	4.6 (2.8)	6.2 (2.8)	53.5†	8.2*	10.3*
Antiprecautions	4.5 (2.9)	5.8 (3.0)	3.4 (2.4)	5.2 (3.1)	20.9†	13.4*	3.1
Fatalism	6.5 (2.2)	6.8 (2.4)	5.9 (2.1)	6.7 (2.3)	111.6*	39.2*	1.1
Denial	7.5 (3.0)	7.0 (3.1)	6.1 (3.4)	6.9 (3.1)	1.1	22.7*	19.6*
AIDS related knowledge							
Correct (%)	78.1 (11.4)	78.6 (11.2)	79.1 (12.8)	76.6 (14.4)	2.6	0.7	1.3
Don't know (%)	11.9 (10.6)	10.7 (9.5)	9.9 (10.9)	10.1 (12.7)	0.6	10.8*	0.2

*0.05 > p > 0.01; † 0.01 > p > 0.001.

Table 3 Percentage of respondents who would avoid certain groups of people and the average number of groups avoided

Group	1989		1994	
	Females N = 602	Males N = 185	Females N = 545	Males N = 239
Persons from high risk areas	3.3	5.4	2.0	10.9
Gay males	18.3	34.6	9.5	37.8
Male bisexuals	16.1	29.7	8.4	33.2
Prostitutes	27.4	37.3	16.9	35.3
Haemophiliacs	8.0	11.9	3.9	16.8
Injection drug users	26.4	34.6	15.6	37.8
Number of groups avoided				
Mean (SD)	1.0 (1.6)	1.5 (1.8)	0.6 (1.2)	1.7 (2.0)

Table 4 Percentage of respondents engaging in sexual behaviour

Behaviour	1989		1994	
	Females N = 603	Males N = 182	Females N = 545	Males N = 242
Vaginal sex with casual partner	15.4	34.1	20.2	50.0
Vaginal sex with regular partner	38.6	46.2	44.0	54.5
Anal sex with casual partner	1.2	2.2	3.1	6.6
Anal sex with regular partner	4.8	6.6	4.6	9.9
Oral sex with casual partner	18.9	40.7	20.6	43.8
Oral sex with regular partner	43.4	49.5	42.6	50.8
Withdrawal with casual partner	8.8	17.6	10.5	25.2
Withdrawal with regular partner	26.7	25.8	27.3	29.8

Table 5 Percentage of respondents reporting condom use

	1989		1994	
	Females	Males	Females	Males
Vaginal sex with casual partner	N = 94	N = 63	N = 134	N = 136
Condom use always	29.8	33.3	55.2	72.1
Vaginal sex with regular partner	N = 239	N = 85	N = 246	N = 146
Condom use always	15.9	25.9	43.1	51.4
Anal sex with casual partner	N = 5	N = 4	N = 40	N = 45
Condom use always	0.0	50.0	42.5	64.4
Anal sex with regular partner	N = 27	N = 11	N = 50	N = 49
Condom use always	11.1	36.4	42.0	53.1
Oral sex with casual partner	N = 108	N = 71	N = 137	N = 113
Condom use always	0.9	2.8	10.9	23.0
Oral sex with regular partner	N = 251	N = 86	N = 225	N = 123
Condom use always	0.8	1.2	9.3	19.5

Numbers reported here cannot necessarily be inferred from Table 4 as some respondents who reported engaging in a particular practice did not report their condom use for that practice.

each of the institutions involved and participating students provided informed consent.

Results

Sample Data were available for 885 and 1139 respondents in 1989 and 1994 respectively. Responses from 145 individuals were excluded either because they acknowledged homosexual activity or failed to indicate their sexual identity. Of the remaining 1879 respondents, 190 (10.1%) failed to complete all demographic items, 225 (11.9%) failed to complete the demographic items and the sections related to knowledge and attitudes, 307 (16.3%) failed to complete the demographic items and the section dealing with sexual behaviour, and 309 (16.4%) failed to complete the demographic items and the section dealing with social avoidance.

The samples differed significantly on all the demographic characteristics available (table 1). However, in both samples the females out-

numbered males, and the majority were aged 18 or 19 years and living with their parents. More marked differences were noted with respect to institution, living arrangements and course of study and these variables were also included in all analyses. The differences raise the possibility that the sample may not be strictly comparable, possibly due to the different recruitment strategies. The analyses that follow included all available demographic variables so that the possibility of sampling differences could be examined. However, the focus of this study was change over time and whether such changes were the same for males and females. Therefore, significant effects relating to factors other than sex and cohort will not be reported unless they significantly interact with either sex or cohort.

Attitudes to precautions

Abrogation of responsibility There was a significant main effect of sex with males reporting more abrogation of responsibility than females (table 2). There was also a significant decline in abrogation of responsibility between 1989 and 1994. A significant interaction between cohort and sex indicated that although there had been a decline in abrogation of responsibility of more than 15% among females, the situation remained unchanged among males.

Fatalism Males were more fatalistic than females and the 1989 cohort was more fatalistic than the 1994 cohort (table 2). No interactions proved significant.

Antiprecautions Males were more antiprecautionary than females and the 1989 cohort was more antiprecautionary than the 1994 cohort (table 2). No interactions proved significant.

Denial of risk The 1994 cohort displayed less denial of risk than the 1989 cohort (table 2). There was a significant interaction between sex and cohort even though sex itself was not significant. Females demonstrated a decline in denial of risk whereas males did not (table 2).

Knowledge A one way analysis of variance revealed a significant main effect of cohort on the percentage of "don't know" responses on the HIV-related knowledge scale (table 2), whereby the 1989 cohort had a greater percentage of "don't know" responses than the 1994 cohort. There was a significant interaction between cohort and institution ($F_{(2, 1594)} = 8.5$, $p < 0.001$) with respect to respondents offering a "don't know" response whereby there was a more marked decline in "don't know" responses at University A than at either B or C.

There were no significant main effects in the analysis of the percentage of correct responses.

Social avoidance For each of the named groups, logistic regression was used to predict those who reported avoiding that groups from those who did not report avoiding that group. Significant effects of sex were observed on all social avoidance items (table 3). Males were always more likely to be avoidant and odd ratios varied between 2.05 (1.61–2.62, 95% CI; $p < 0.001$) for prostitutes and 3.62 (2.79–4.71; $p < 0.001$) for gay males. Cohort effects were observed on items relating to gay

males, prostitutes, haemophiliacs, and injecting drug users. All effects indicated a decreased likelihood of avoidance from 1989 to 1994 and odds ratios varied between 0.59 (0.39–0.88; $p < 0.05$) for haemophiliacs and 0.69 (0.53–0.89; $p < 0.01$) for gay males. Significant sex by cohort interactions were observed for the social avoidance of gay males, haemophiliacs, and injecting drug users with females demonstrating less avoidance over time and males showing no change or more avoidance (table 3). A significant main effect of institution was found in relation to avoiding haemophiliacs and there was also a significant interaction between institution and cohort for this item. These effects indicated that students at University A were generally more likely to avoid haemophiliacs but this difference had largely disappeared by 1994.

Analysis of variance of the number of groups avoided indicated a significant main effect of sex ($F_{(1\ 1509)} = 92.9$, $p < 0.001$) with males avoiding more groups than females and a significant main effect of cohort ($F_{(1\ 1509)} = 17.2$, $p < 0.001$). There was a sex by cohort interaction ($F_{(1\ 1509)} = 12.1$, $p = 0.001$) indicating that females had become less avoidant whereas males were more so. There was also a significant interaction between cohort and institution ($F_{(2\ 1509)} = 16.7$, $p < 0.001$) indicating that while there had been modest reductions in avoidance at Universities B and C, there had been a very marked decline at University A.

Sexual behaviour For each named behaviour, logistic regression was used to predict those who engaged in that behaviour from those who did not. Significant differences between males and females were identified for engaging in vaginal sex with casual and regular partners, oral sex with casual partners, and withdrawal with casual partners (table 4). Males were consistently more likely to report the behaviours and odds ratios varied between 1.52 (1.20–1.91; $p < 0.001$) for vaginal sex with regular partners and 3.86 (2.99–4.98; $p < 0.001$) for vaginal sex with casual partners. The only cohort effect was for anal sex with casual partners. This was more common in 1994 than 1989 (3.08, 1.54–6.14; $p < 0.001$).

Condom use Logistic regression analysis indicated significant variation in condom use with respect to cohort (table 5) with the exception of always using condoms for anal sex where no main effects were significant.

Moderate effects of cohort on always using condoms were observed for vaginal sex with both casual partners (OR = 3.77 (2.44–5.83); $p < 0.001$) and with regular partners (3.83 (2.65–5.59); $p < 0.001$). More striking effects of cohort were observed for always using condoms for oral sex with casual partners (9.25 (2.76–30.97); $p < 0.001$) and always using condoms for oral sex with regular partners (13.74 (4.19–45.07); $p < 0.001$).

Discussion

The samples from 1989 and 1994 differed on relevant demographic characteristics, raising

the possibility that the samples may not be strictly comparable. However, when taking into account those characteristics, a range of differences between the cohorts remained.

This study demonstrated that there have been significant changes in sexual practices, knowledge and attitudes among first-year university undergraduates between 1989 and 1994. The changes in attitudes largely relate to improvement among young women. At best, young men's attitudes to AIDS precautions have not declined but in some cases have become more negative. For example, the 1994 males reported greater readiness than their female counterparts to shift responsibility for HIV/AIDS precautions to others, together with no improvement in fatalistic attitudes to HIV/AIDS over their 1989 peers. As well, these males were more likely to avoid groups perceived to be vulnerable to infection.

Young men remained more sexually active than young women. However, there was only one significant change in the rates of sexual behaviour between the cohorts, that for anal sex with casual partners. The lack of a general change in the rate of sexual activity in this age group has been noted elsewhere.^{6,7} For both sexes, condom use for vaginal sex with casual partners and regular partners and for oral sex with casual and regular partners has increased. This latter finding is consistent with studies of other undergraduates.¹²

The majority of the young women in this study will mix socially and sexually with these young men and it may have been hoped that the changes in young men would mirror those in the young women. The increase in condom use by both sexes is encouraging; however, the disparity in attitudes gives cause for concern. The apparent failure of HIV/AIDS education for the young men in this study in respect of attitudes may relate to three factors. Firstly, education messages may not have been targeted appropriately, although the mixed results for young men suggest that at least some elements of campaigns may have been successful. Secondly, there may have been too much emphasis on reaching young women. Finally, these findings may reflect uncertainties and concerns of young men as they attempt to deal with feminism and new meanings of masculinity, in the context of redefining male sexuality.

The gap between males and females in attitudes suggests that there may be a different basis for condom use by the sexes and highlights the complexity of the links between knowledge, attitudes, and behaviours. While there is no simple relationship between these three in relation to HIV/AIDS,¹² the data presented here suggest the possibility of an inverse relationship for males, namely a decline in appropriate attitudes being coupled with a marked increase in appropriate behaviour. For females, the pattern of relationships is as may be expected, with increased condom use associated with more positive attitudes.

Regardless of this additional complexity, and in spite of the improvements in the extent of condom use among these cohorts, the rates

of condom use still fall below those which may be desirable for the prevention of transmission of HIV and other sexually transmissible diseases among these sexually active young adults. Furthermore, given that HIV/AIDS education campaigns aim to change behaviour and promote more positive attitudes towards people affected by the virus, the Australian experience demonstrates only partial success. The general decline in attitudinal measures among young men contrasts with a marked improvement among young men contrasts with a marked improvement among young women and suggests the need for education programs targeted specifically at this group.

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