

Reproductive health: Contraception, conception and change of life - Findings from the Australian Longitudinal Study on Women's Health

Report prepared for the Australian Government Department of Health

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5. TRENDS IN WOMEN'S USE OF LARC METHODS

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For this chapter, long acting reversible contraception (LARC) has been defined as use of the:

- Progestogen-only (hormonal) IUD;
- Progestogen (hormonal) subdermal implant; and
- Copper IUD

A smaller, lower dose hormonal IUD was listed on the PBS in March 2020 however it is outside the period of observation.

PBS subsidies are not available for all LARCs, with the copper IUD not PBS listed. MBS covers insertions of all three LARCs however MBS data do not include procedures carried out at facilities which do not bill through Medicare (e.g., public hospitals).

*Note: This definition is in line with current approaches to contraceptive research (Harris et al., 2020) and differs to the definition used in the previous chapters. While medium acting contraceptives (e.g., contraceptive injection) have previously been included with long acting methods, these contraceptives have similar failure rates to short acting hormonal methods such as the OCP during the first year of typical use and as such it is no longer consider appropriate to combine these (Trussell, 2011).

5.1 Key points

- The lifetime prevalence of copper IUDs (27.5%) was higher than for implants (15.3%) in the 1973-78 cohort. However, in the 1989-95 cohort, this trend was reversed, with implants having a greater lifetime prevalence (32.0%) compared to IUDs (19.9%).
- The median age of first implant insertion was 31 years for the 1973-78 cohort, and 20 years for the 1989-95 cohort. This age was considerably younger than the median age of first IUD insertion, which was 37 years for the 1973-78 cohort, and 24 years for the 1989-95 cohort.

- The factor most strongly associated with LARC use was the number of children women had, with higher odds of LARC use with increasing numbers of children. Similar effects were seen for history of pregnancy (both cohorts) and history of termination (1989-95 cohort).
- Women in the 1989-95 cohort were less likely to use LARC when they had a history of miscarriage.
- Women in the 1989-95 cohort with a history of being in a violent relationship were more likely to use LARC than women who had not been in a violent relationship.

In the 1989-95 cohort:

- The older women were less likely to use LARC, particularly implants.
- Women born in non-English speaking countries were less likely to use IUDs, compared to those born in Australia or other English-speaking countries.
- LARC use increased with higher levels of education.
- Unpartnered women were more likely to use LARC than partnered women.
- Women in regional areas were more likely to use implants, compared with women in major cities.
- Women with a BMI in the underweight range were less likely to use LARC, and women with a BMI in the obese range were more likely to use LARC, compared with women with a BMI in the healthy weight range.
- Current smokers were more likely to use LARC than non-smokers.
- Non-drinkers and those who drank rarely were less likely to use LARC, compared to low-risk drinkers.

In the 1973-78 cohort:

- Country of birth was associated with use of implants, but not IUDs, with women born outside Australia less likely to use implants.
- Non-partnered women were more likely to use implants than partnered women.
- Women in regional and remote areas were more likely to use implants, compared with women in major cities.
- Smokers were less likely to use IUDs, compared to non-smokers.
- Non-drinkers were less likely to use IUDs than low-risk drinkers.

5.2 Introduction

This chapter examines trends in the use of LARC over time for women in the 1973-78 and 1989-95 cohorts. LARC methods include progestogen subdermal implants, copper IUDs, and progestogen-only (hormonal) IUDs. Subdermal implants, hormonal IUDs and copper IUDs are considered more efficacious than other contraceptive methods in preventing unintended pregnancy since they require a single procedure that can provide contraception for at least three years (Temple-Smith & Sancu, 2017). LARC can also provide other benefits for women's health, including reduced menstrual pain and bleeding (Bahomondes et al., 2020). However, despite their efficacy and safety, the uptake of implants and IUDs among women in Australia remains low, particularly in comparison with European countries (Harris et al., 2020).

An earlier assessment of LARC use by women in the 1973-78 cohort examined the uptake of LARC from when women were aged 25–30 (2003) when around 4% of the cohort were using LARC, to when women were aged 31–36 (2009) with 9% using LARC at that time (Lucke & Herbert, 2014). The current analyses will provide further information on the increase of LARC use among women in the 1973-78 cohort as they age, as changes in their family planning needs occur, and against the context of changing awareness and attitudes towards LARC use. We are also able to compare LARC use among women in their late thirties and early forties with that of women in

the cohort born 1989-95, who are younger and at an earlier life stage, and who commenced using contraception when LARC was more widely available and accepted.

This chapter also extends on the analyses presented in [Chapter 2](#) which showed how the use of LARC methods more than doubled as women age (from 10% when women were 28 to 33 years, to 24% when they were aged 40 to 45 years). However, the data presented in this chapter differs in that 1) LARC use is ascertained from MBS and PBS data, and 2) the analysis only includes women who were eligible for linkage to MBS and PBS data and who completed surveys between 2002 and 2020. We compare the agreement or discrepancy between self-reported contraceptive use (as presented in [Chapter 2](#)) and contraceptive use as ascertained from MBS/PBS as used in this chapter. The information presented in this chapter, therefore, should be viewed as pertaining to women born 1973-78 and 1989-95 who have used LARC via the PBS and MBS, from 2002-2020.

5.3 Summary of previous published work with a focus on LARC use

Previous studies using ALSWH data have revealed patterns in LARC and OCP use among women from the 1946-51, 1973-78, and 1989-95 cohorts. These studies show that LARC is used more by the younger cohorts compared to the 1946 cohort, and that the use of LARC has increased over time. A sub-study of the 1946-51 cohort gathered detailed information about the reproductive histories of the 812 women who had experienced at least one pregnancy by 2003, when women were in their mid-50s. For these women, the OCP was the most commonly reported contraceptive method ever used (94%), while less than 40% had ever used an IUD (Read et al., 2009).

Most of the published ALSWH research on contraceptive trends reports on samples of women from the 1973-78 cohort. Lucke et al. (2009) examined contraceptive use patterns among 6,708 women from this cohort from 1996 to 2006, as they aged from their late teens to their early 30s. The OCP was the most common single contraceptive method at all four time points, however, use decreased over the study period from 39% to 27%, and use of LARC increased.

A later study of the same cohort identified patterns of contraceptive use in relation to reproductive events including births, miscarriages, and terminations (Lucke et al., 2011). Contraception method was broadly defined as any method of non-permanent contraception, including LARC and the OCP. Data from 5,631 women showed that contraception use increased after the birth of a child, and decreased after a miscarriage, suggesting intentions for family formation and spacing between children (Lucke et al., 2011)

Another analysis distinguished between use of LARC and OCP among women from the 1973-78 cohort (Lucke et al., 2014). In this analysis, LARC use among 5,849 women remained relatively low over time, despite increasing from 4% in 2003 to 9% in 2009. The proportion of those using the OCP as a sole method decreased from 33% to 22% over the study period, as did the proportion of those using the OCP in combination with condoms (13% in 2003 and 5% in 2009). The study found a higher uptake of LARC methods among women living in rural and remote areas, compared to those in major cities (Lucke et al., 2014).

Recently, data from the 1989-95 cohort have been used to examine the contraceptive trends of young women from their late teens to their mid-twenties (Rowlands et al., 2020). Among a sample of 4,952 women, the proportion of OCP users decreased from 60% in 2013 to 41% in 2017. Conversely, the percentage of LARC users increased from 13% to 21%. A range of health factors were also linked to different contraceptive methods. Women who used LARC were more likely to: have a BMI in the overweight and obese range; be current smokers; report fair or poor general health; and report very high levels of psychological distress, compared to those using the OCP (Rowlands et al., 2020).

5.4 Identification of LARC use

Data from the ALSWH 1973-78 and 1989-95 cohorts were deterministically linked to the MBS and PBS data by the AIHW using Medicare Personal Identification Numbers. MBS data were available from 01 January 1996 to 30 June 2020, and PBS data were available from 01 May 2002 to 30 June 2020. For consistency with the PBS dataset, we analysed MBS data from 01 May 2002 to 30 June 2020. During this period, women

in the 1973-78 cohort were aged from 24-29 years in 2002 to 42-47 years in 2020. Women in the 1989-95 cohort were aged from 18-23 years in 2013 to 25-30 years in 2020.

MBS and PBS data records were used to identify item codes for IUDs and implants as listed in Table 5-1. Where multiple MBS or PBS items were recorded within 7 days, only the first item was counted in order to avoid double counting of different but related items.

Table 5-1 MBS and PBS item codes for LARC

Source	Contraceptive	Item Code	Description
MBS	Hormonal and Copper IUD	35503	Intra uterine contraceptive device, introduction of, if the service is not associated with a service to which another item in this Group applies (other than a service mentioned in item 30062)
MBS	Implant	14206	Hormone or living tissue implantation by cannula
PBS	Implant	8487Q	Etonogestrel (Implanon NXT)
PBS	Hormonal IUD	8633J	Levonorgestrel (Mirena)

Note: the PBS IUD item only includes the hormonal IUD (Mirena), whereas the MBS IUD item includes both the hormonal IUD and the copper IUD.

It was not possible to accurately determine IUD removal as this service is billed under item code 36 (attendance by a GP). There was a specific code for the removal of an etonogestrel subcutaneous implant (item codes 30062), but this code was not analysed as equivalent removal codes were not available for the other three item codes. It was not possible to distinguish between hormonal IUDs and copper IUDs in the MBS data as they share the same removal item codes.

5.5 Use of LARC by women in the 1973-78 and 1989-95 cohorts

Table 5-2 shows the percentage of women who had ever used a form of LARC during the period 2002-2020, for the 1973-78 and 1989-95 cohorts. Women in the 1973-78 cohort were less likely to have used LARC (37.6%) than the 1989-95 cohort (43.8%). The lifetime prevalence of IUDs (27.5%) was higher than implants (15.3%) in the 1973-78 cohort. However, in the 1989-95 cohort, this trend was reversed, with implants having a greater prevalence (32.0%) compared to IUDs (19.9%).

The median age of first implant insertion was 31 years for the 1973-78 cohort and 20 years for the 1989-95 cohort. This age was considerably younger than the median age of first IUD insertion, which was 37 or 24 years, for the 1973-78 and the 1989-95 cohorts respectively.

Across both cohorts, approximately half of LARC users had only one MBS or PBS record indicating LARC use. One in four had two records, and one in four had three or more records. Furthermore, despite women in the 1989-95 cohort being much younger than those in the 1973-78 cohort, they have had a similar number of LARC uses compared with their older counterparts. This comparison is further evidence of increased uptake of these contraceptives among the younger cohort. The data showed that few women have ever used both an IUD and an implant (14% and 19% of women in the 1973-78 and 1989-95 cohorts, respectively), with most women choosing to use only one type of LARC. Women may still switch between types of IUDs (e.g., from hormonal to copper), but this was not explored in the current analysis.

Table 5-2 Number and percentage of women born 1973-78 and 1989-95 who have used LARC (2002-2020)

		1973-78 cohort N (%)	1989-95 Cohort N (%)
Number of women		13,503	16,993
Ever used LARC	Yes	5,075 (37.6%)	7,447 (43.8%)
Ever used IUD	Yes	3,707 (27.5%)	3,379 (19.9%)

		1973-78 cohort N (%)	1989-95 Cohort N (%)
Ever used implant	Yes	2,071 (15.3%)	5,446 (32.0%)
No. of LARC between 01 May 2002 - 30 June 2020	1	2,280 (44.9%)	3,377 (45.3%)
	2	1,303 (25.7%)	2,086 (28.0%)
	3+	1,492 (29.4%)	1,984 (26.6%)
No. of IUDs between 01 May 2002 - 30 June 2020	1	1,960 (52.9%)	2,258 (66.8%)
	2	996 (26.9%)	836 (24.7%)
	3+	751 (20.3%)	285 (8.4%)
No. of implants between 01 May 2002 - 30 June 2020	1	1,139 (55.0%)	2,862 (52.6%)
	2	421 (20.3%)	1,398 (25.7%)
	3+	511 (24.7%)	1,186 (21.8%)
Age of first LARC, median (IQR)		35 (30, 39)	22 (19, 24)
Age of first IUD, median (IQR)		37 (33, 41)	24 (22, 26)
Age of first implant, median (IQR)		31 (28, 36)	20 (18, 23)

Figure 5-1 shows the percentage of women with MBS or PBS items for LARC for each year between 2002 and 2020, and demonstrates an increase in the use of LARC over time for both cohorts. However, this increase has been primarily driven by more women using IUDs rather than an increase in the use of implants. Overall, the use of LARC was much higher in the 1989-95 cohort compared to the 1973-78 cohort.

It is important to note that Figure 5-1 is not an estimate of the prevalence of LARC use, since a LARC could be inserted in a particular year and remain active for a further three to five years (if not discontinued early) without any subsequent MBS or PBS records. Prevalence of the use of different forms of contraception has been presented in [Chapter 2](#).

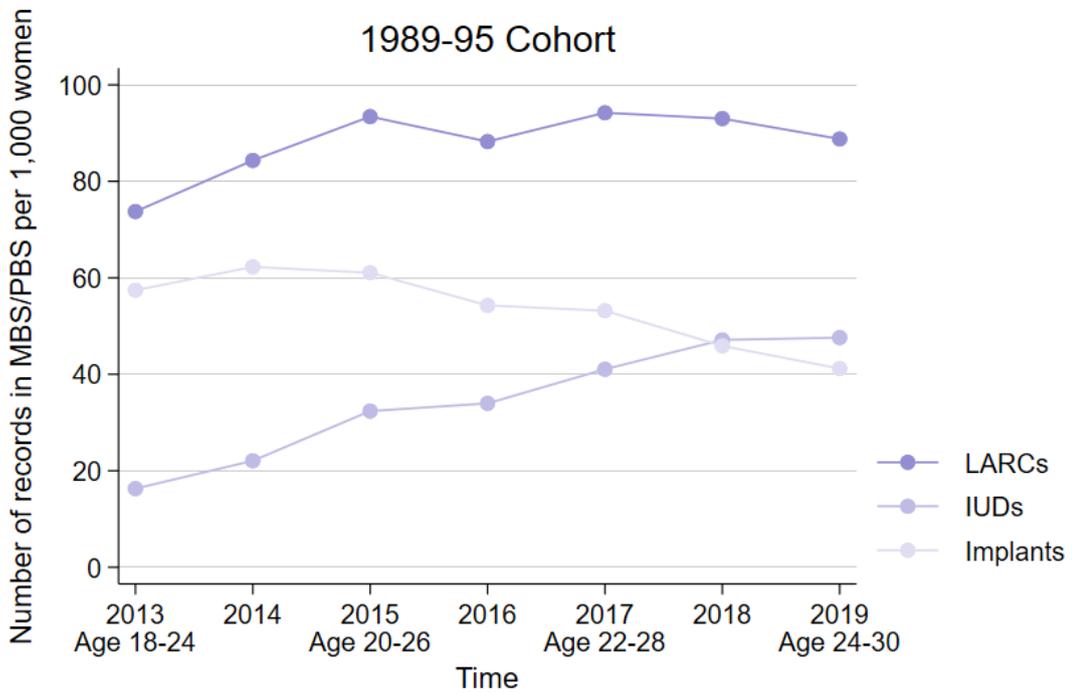
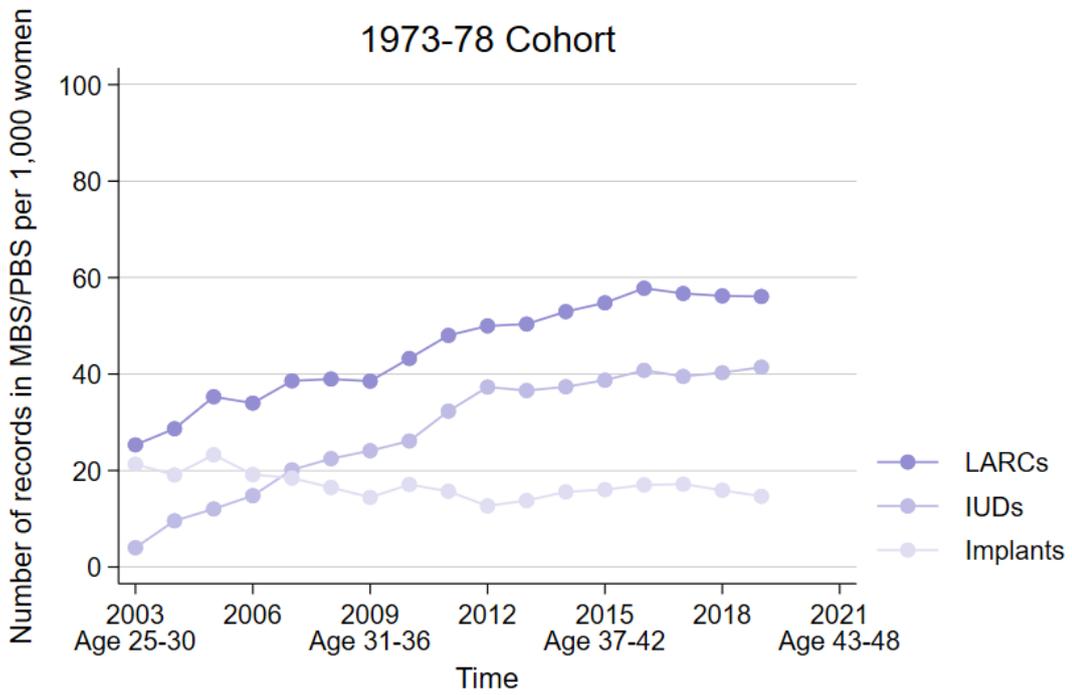


Figure 5-1 Trends in MBS or PBS items for LARCs over time, expressed as the number of items per 1000 women for each year.

5.6 Agreement between MBS and PBS data and self-report survey data

The surveys issued in 2009, 2012, 2015, and 2018 to the 1973-78 cohort included questions on the use of progestogen IUDs, copper IUDs and implants. The surveys issued to the 1989-95 cohort in 2013, 2014, 2015, and 2017 included questions on the use of progestogen IUDs and implants. Women in the 1989-95 cohort could also have indicated use of copper IUDs at Survey 1 via a free-text response option. These survey responses provide an opportunity to compare the information provided by the women with information that can be derived from administrative data. The overall percentage agreement between MBS/PBS and survey responses was 60.3% and 89.1% in the 1973-78 and 1989-95 cohorts, respectively. The percentage agreements decreased over time in both cohorts (see Table 5-3).

The low percentage of agreements may be partially explained by women who have obtained LARC but the practitioners billed the consultation to another billing item. The low agreement might also be explained by women who received LARC services in facilities that do not bill through Medicare (e.g., public hospitals). Perhaps to a lesser extent, the low agreement might also be explained by women using non-PBS and non-MBS listed LARC. Further investigation into the reasons for lack of agreement between self-report survey data and MBS and PBS data, particularly in the 1973-78 cohort, is required.

Table 5-3 Percentage agreement between self-reported LARC use and MBS and PBS records

Cohort	Survey	Year	Women who self-reported a LARC via an ALSWH survey	Women who self-reported LARC, and had a LARC record in MBS or PBS in the last three years	
			N	N	%
1973-78	5	2009	625	491	78.6
	6	2012	855	626	73.2
	7	2015	983	665	67.7

Cohort	Survey	Year	Women who self-reported a LARC via an ALSWH survey	Women who self-reported LARC, and had a LARC record in MBS or PBS in the last three years	
	8	2018	1,179	777	65.9
1989-95	1	2013	1,802	1,646	93.3
	2	2014	1,356	1,256	92.6
	3	2015	1,306	1,212	92.8
	5	2017	1,558	1,378	88.5

5.7 Factors associated with use of LARC

This section of the report provides information on socioeconomic and personal factors associated with LARC use generally, and IUD or implant use more specifically. The associations were tested in longitudinal models (GEEs) which include the use of LARC determined from MBS/PBS for each three year period preceding the return date for each ALSWH survey, and associated with factors derived from the corresponding survey responses. The associations are shown in Figure 5-2, Figure 5-3, Figure 5-4, Figure 5-5, Figure 5-6 and Figure 5-7 for each outcome (LARC, IUD, implants) and cohort and are summarised in Table 5-4 (1973-78 cohort) and Table 5-5 (1989-95 cohort) at the conclusion of this chapter.

Figure 5-2 and Figure 5-3 show the factors associated with LARC use, considering both IUDs and implants together. The factor most strongly associated with LARC use was the number of children, with higher odds of LARC use with increasing numbers of children. Similar effects were seen for history of pregnancy (both cohorts) and history of termination (1989-95 cohort). Women with a history of miscarriage in the 1989-95 cohort were less likely than those without such a history to use LARC. Women in the

1989-95 cohort with a history of being in a violent relationship were also more likely to use LARC than women who had not been in a violent relationship.

Non-partnered compared to partnered women had higher odds of LARC use in both cohorts. Women with post-school qualifications had higher odds of LARC use in the 1989-95 cohort, but there was no evidence for an effect of education in the 1973-78 cohort. Women living in regional areas had higher odds of LARC in both cohorts. Higher use of alcohol was associated with LARC in the 1973-78 cohort, and obesity was associated with higher use of LARC in both cohorts (with underweight having a negative relationship). Current smokers in the 1989-95 cohort had increased odds of LARC use compared to non-smokers.

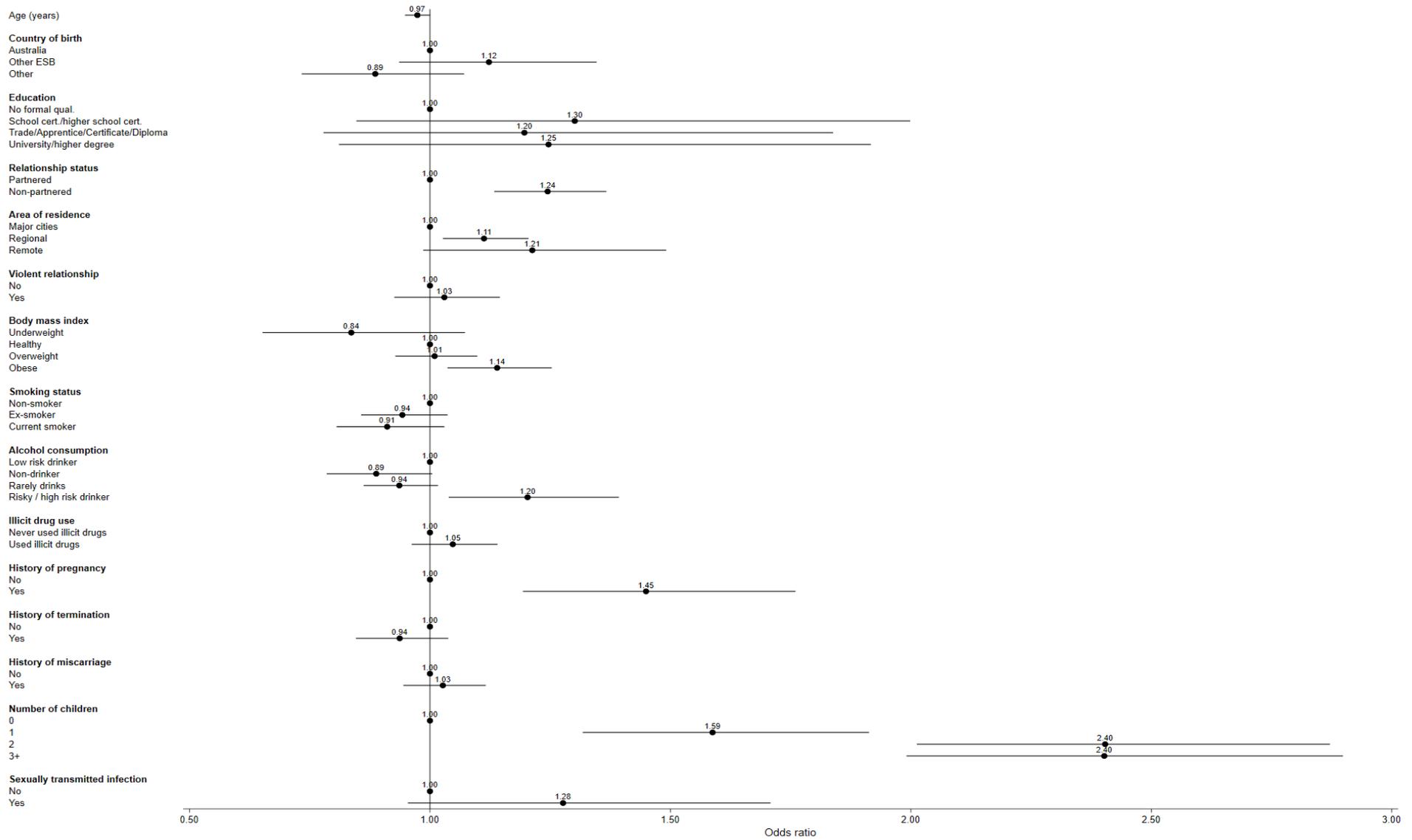


Figure 5-2 GEE estimates and 95% CIs for LARC insertions (both IUDs and implants) among the 1973-78 cohort.

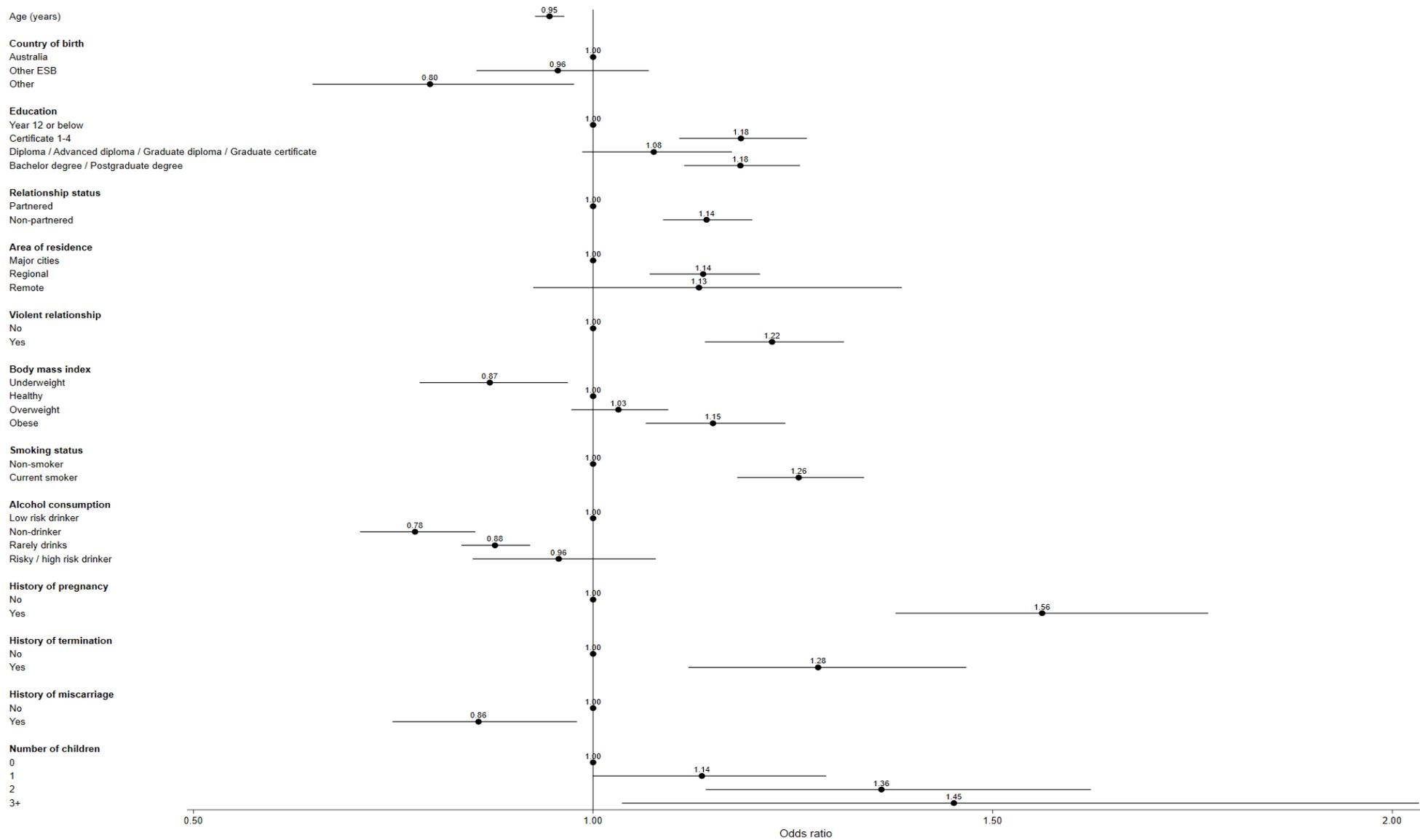


Figure 5-3 GEE estimates and 95% CIs for LARC insertions (both IUDs and implants) among the 1989-95 cohort.

Figure 5-4 and Figure 5-5 below show factors associated with IUD use. In the 1973-78 cohort, the odds of IUD use were higher for women who were non-partnered (compared to partnered), lived in regional areas (compared to major cities), were in the obese category (compared to a healthy weight), and who were risky/high risk drinkers (compared to non-drinkers). Women who had history of pregnancy and those who had more children also had higher odds of IUD use.

Similar effects for being non-partnered and living in regional areas were seen for the 1989-95 cohort. However, in this cohort, women also had higher odds of IUD use if they had a higher level of education, ever lived with a violent partner, and if they were smokers. Women had lower odds of IUD use if they were born in a non-English speaking country (compared to Australia or another English speaking country) and if they were non- or rare drinkers (compared to low risk drinkers). Again, women were more likely to use an IUD if they had been pregnant and if they had more children. History of termination was also associated with higher odds of IUD use.

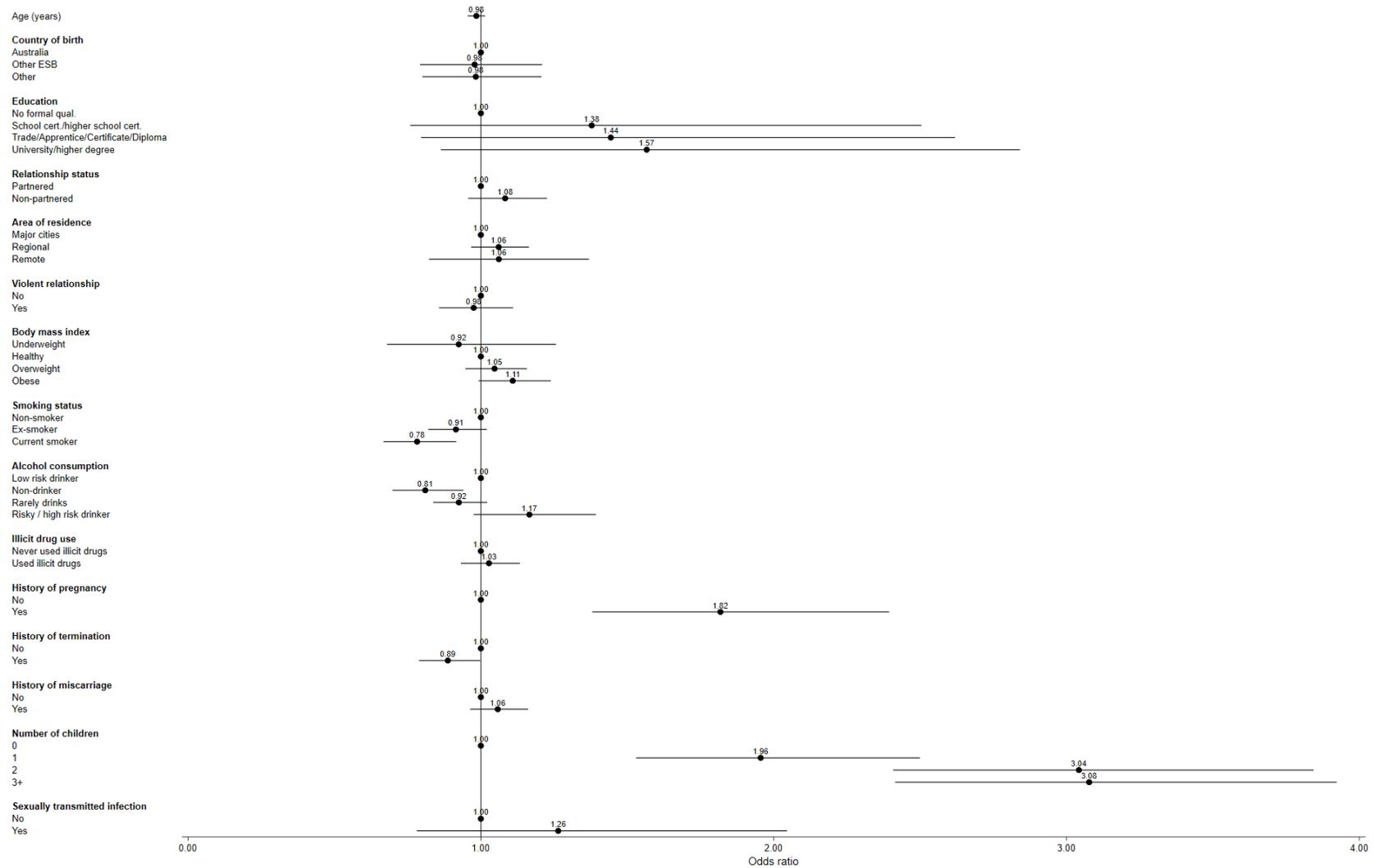


Figure 5-4 GEE estimates and 95% CIs for IUD insertions among the 1973-78 cohort.

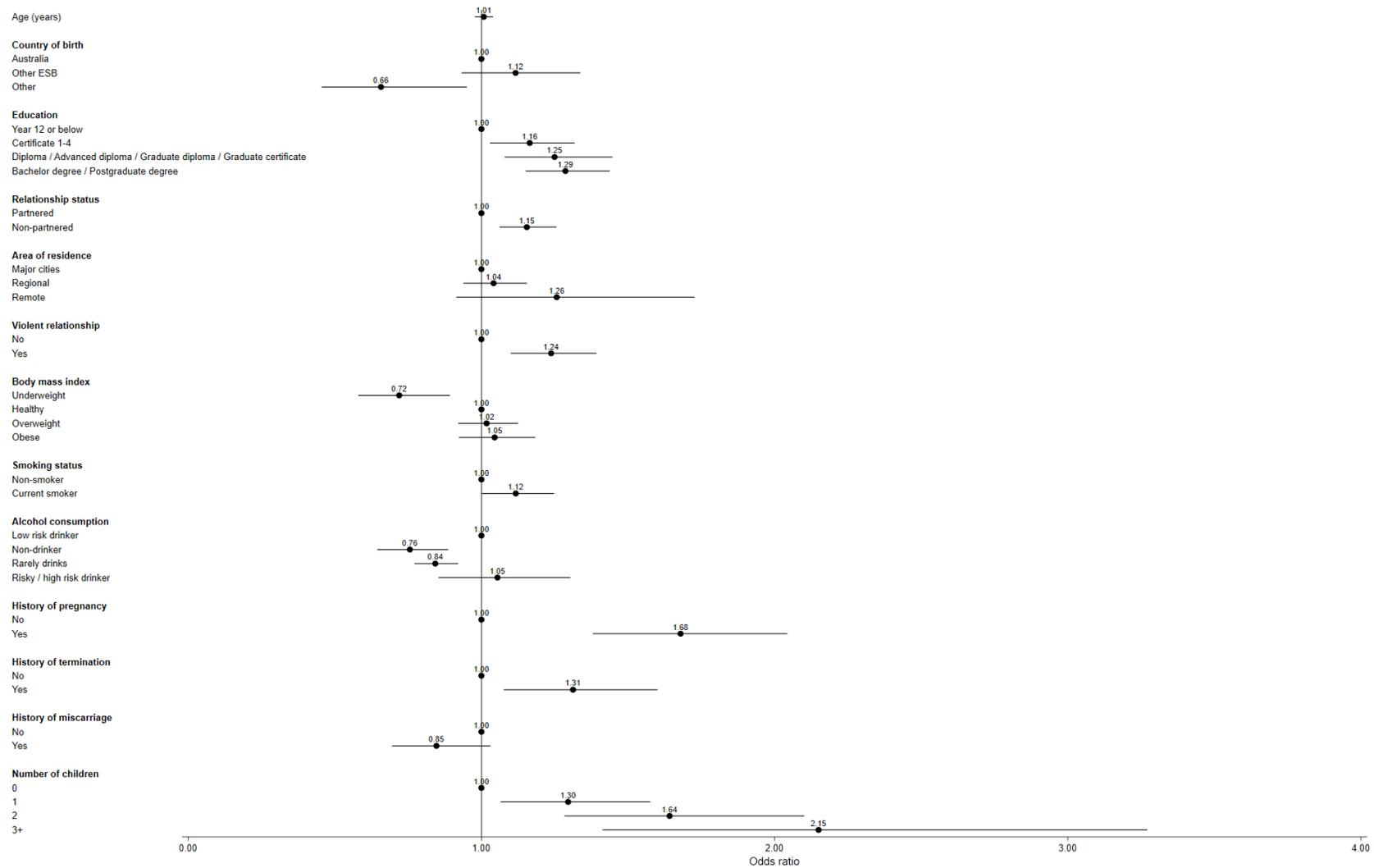


Figure 5-5 GEE estimates and 95% CIs for IUD insertions among the 1989-95 cohort.

Figure 5-6 and Figure 5-7 show factors associated with implants. In the 1973-78 cohort, the odds of implant use, relative to women born in Australia, were higher for women who were born in another English-speaking country and were lower for women born in a non-English speaking country. Odds of implant use were higher for women who were non-partnered (compared to partnered), and for those in regional and remote areas (compared to major cities). Women who had history of pregnancy and those who had more children also had higher odds of implant use.

In the 1989-95 cohort, the odds of implant use were higher for women with higher levels of education, who were non-partnered, and living in regional areas. Women with a BMI in the obese range, and women who had been in a violent relationship also had higher odds of implant use. Women who never or rarely drank had lower odds of implant use (compared to low-risk drinkers). Women who had a history of pregnancy had higher odds of implant use, but there was no significant association with the number of children. There was also an association between women's age and the use of implants, with lower odds of implant use with increasing age of the women.

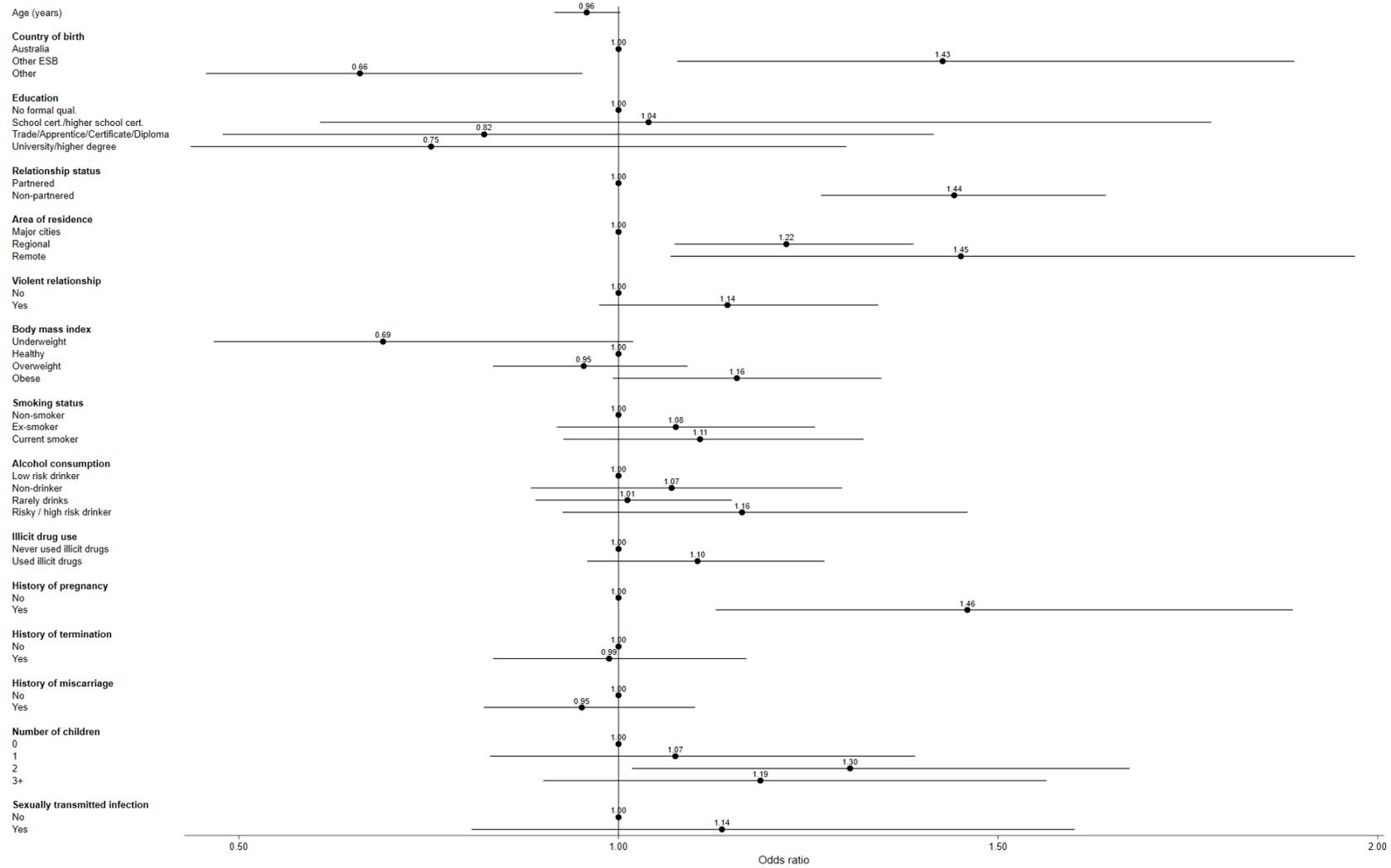


Figure 5-6 GEE estimates and 95% CIs for implant insertions among the 1973-78 cohort.

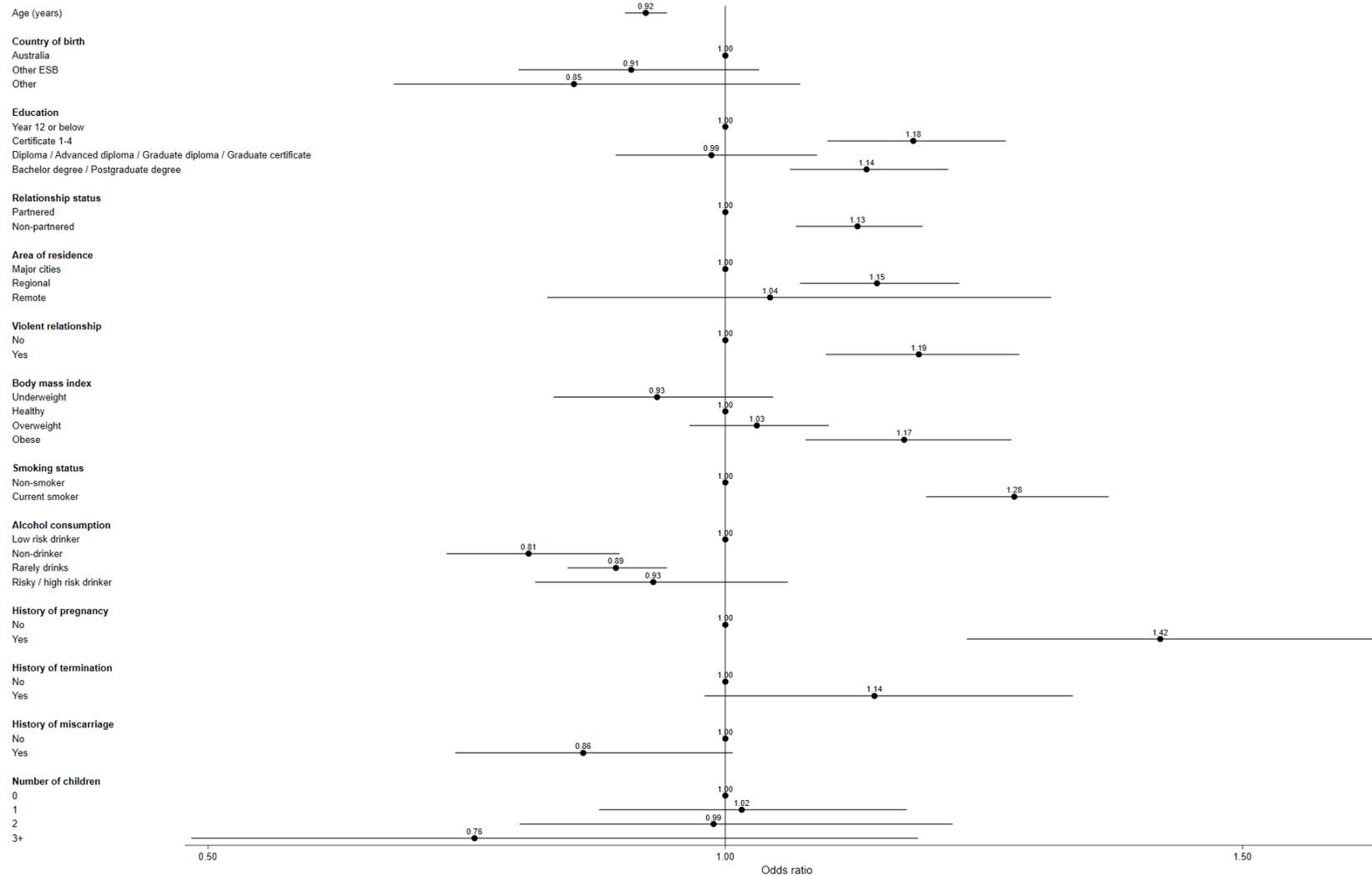


Figure 5-7 GEE estimates and 95% CIs for implant insertions among the 1989-95 cohort.

Table 5-4 Summary of directions of associations between covariates and LARC, IUD or implant in the 1973-78 cohort

Characteristic	LARC	IUD	Implant
DEMOGRAPHICS			
Age	-	-	-
Country of birth			
Australia	Ref.	Ref.	Ref.
Other English Speaking Country	-	-	↑
Other	-	-	↓
Highest qualification			
No formal qualifications	Ref.	Ref.	Ref.
School/higher school cert.	-	-	-
Trade/apprentice/cert./diploma	-	-	-
University/higher degree	-	-	-
Current relationship status			
Partnered	Ref.	Ref.	Ref.
Non-partnered	↑	-	↑
Area of residence			
Major cities	Ref.	Ref.	Ref.
Regional	↑	-	↑
Remote	-	-	↑
HEALTH BEHAVIOURS			
BMI range			
Healthy	Ref.	Ref.	Ref.
Underweight	-	-	-
Overweight	-	-	-
Obese	↑	-	-
Smoking status			
Non-smoker	Ref.	Ref.	Ref.
Ex-smoker	-	-	-
Current smoker	-	↓	-
Alcohol consumption			
Low risk drinker	Ref.	Ref.	Ref.
Non-drinker	-	↓	-
Rarely drinks	-	-	-
Risky/high risk drinker	-	-	-
Illicit drug use			
Never used	Ref.	Ref.	Ref.
Ever used	-	-	-

Characteristic	LARC	IUD	Implant
REPRODUCTIVE BEHAVIOURS			
History of pregnancy			
No	Ref.	Ref.	Ref.
Yes	↑	↑	↑
History of termination			
No	Ref.	Ref.	Ref.
Yes	-	-	-
History of miscarriage			
No	Ref.	Ref.	Ref.
Yes	-	-	-
Number of children			
0	Ref.	Ref.	Ref.
1	↑	↑	-
2	↑↑	↑↑	↑
3+	↑↑	↑↑	-
Sexually transmitted infection			
No	Ref.	Ref.	Ref.
Yes	-	-	-
OTHER			
Violent relationship			
No	Ref.	Ref.	Ref.
Yes	-	-	-

Single upward arrow indicates positive association at $p < 0.05$; downward arrow indicates negative association at $p < 0.05$; two upward arrows indicate a positive association at $p < 0.05$ and large effect size ($OR > 2.00$).

Table 5-5 Summary of directions of associations between covariates and LARC, IUD or implant in the 1989-95 cohort

Characteristic	LARC	IUD	Implant
DEMOGRAPHICS			
Age			
	↓	-	↓
Country of birth			
Australia	Ref.	Ref.	Ref.
Other English Speaking Country	-	-	-
Other	↓	↓	-
Highest qualification			
Year 12 or below	Ref.	Ref.	Ref.

Characteristic	LARC	IUD	Implant
Certificate 1-4	↑	↑	↑
Diploma/grad. certificate	-	↑	-
Bachelor/postgraduate degree	↑	↑	↑
Current relationship status			
Partnered	Ref.	Ref.	Ref.
Non-partnered	↑	↑	↑
Area of residence			
Major cities	Ref.	Ref.	Ref.
Regional	↑	-	↑
Remote	-	-	-
HEALTH BEHAVIOURS			
BMI range			
Healthy	Ref.	Ref.	Ref.
Underweight	↓	↓	-
Overweight	-	-	-
Obese	↑	-	↑
Smoking status			
Non-smoker	Ref.	Ref.	Ref.
Current smoker	↑	↑	↑
Alcohol consumption			
Low risk drinker	Ref.	Ref.	Ref.
Non-drinker	↓	↓	↓
Rarely drinks	↓	↓	↓
Risky/high risk drinker	-	-	-
REPRODUCTIVE BEHAVIOURS			
History of pregnancy			
No	Ref.	Ref.	Ref.
Yes	↑	↑	↑
History of termination			
No	Ref.	Ref.	Ref.
Yes	↑	↑	-
History of miscarriage			
No	Ref.	Ref.	Ref.
Yes	↓	-	-
Number of children			
0	Ref.	Ref.	Ref.
1	-	↑	-
2	↑	↑	-

Characteristic	LARC	IUD	Implant
3+	↑	↑↑	-
OTHER			
Violent relationship			
No	Ref.	Ref.	Ref.
Yes	↑	↑	↑

Single upward arrow indicates positive association at $p < 0.05$; downward arrow indicates negative association at $p < 0.05$; two upward arrows indicate a positive association at $p < 0.05$ and large effect size ($OR > 2.00$)

5.8 Conclusion

LARC use is more common among women in the 1989-95 cohort than among the 1973-78 cohort, potentially reflecting a tendency for more recent cohorts to be more likely to use these forms of contraception. However, the trends in LARC use over time are different in these two cohorts, reflecting their different life stages and family formation. Among the 1989-95 cohort, LARC use decreased with age, potentially as women moved into the stage where they were intending to become pregnant and to start their families. This cohort also showed a trend to be less likely to use implants as they aged, and more likely to use IUDs.

In contrast, use of LARC increased over time in the 1973-78 cohort, potentially reflecting that these women had finished having children, or wished to delay further pregnancies. Among these women, the use of IUDs was more common than the use of implants. Across both cohorts, the factor most strongly associated with LARC use was the number of children, with higher odds of LARC use occurring with increasing numbers of children.

5.9 References

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