

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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LIST OF ABBREVIATIONS AND ACRONYMS

AIHW	Australian Institute of Health and Welfare
ALSWH	Australian Longitudinal Study on Women’s Health
ART	Assisted Reproductive Technology
BMI	Body Mass Index
CI	Confidence Interval
COVID-19	Corona Virus Disease 2019
CVD	Cardiovascular Disease
EMAS	European Menopause and Andropause Society
GEE	Generalised Estimating Equation
GP	General Practitioner
HR	Hazard Ratio
ICSI	Intracytoplasmic Sperm Injection
InterLACE	Life course Approach to reproductive health and Chronic disease Events
IUD	Intra-Uterine Device
IUI	Intra-Uterine Insemination
IVF	In-Vitro Fertilization
LARC	Long Acting Reversible Contraceptive
MatCH	Mothers and their Children’s Health Study
MBS	Medicare Benefit Schedule
MHT	Menopausal Hormone Therapy
NHMRC	National Health and Medical Research Council
OCP	Oral Contraceptive Pill
OR	Odds Ratio
Pap test/smear	Papanicolaou Test/Smear
PBS	Pharmaceutical Benefits Scheme
PCOS	Polycystic Ovary Syndrome
VMS	Vasomotor Menopausal Symptoms

EXECUTIVE SUMMARY

PREVALENCE OF CONTRACEPTIVE USE ACROSS THE LIFESPAN

- The OCP (including the combined OCP and mini-pill) and condoms are the most common forms of contraception used among women born 1989-95.
- Use of the OCP and condoms is highest when women are in their late teens and early twenties, then declines as they enter their mid- to late twenties.
- Use of the LARC implant, is reported by around 10% of young women, while use of the hormonal IUD increases as women enter their mid- to late twenties.
- There was a reduction in use of contraception as women entered their mid- to late twenties, most likely reflecting the desire to have children.
- Simple prevalence figures on contraception use by women born 1989-95 do not reflect the highly transitional nature of contraception use. Knowing what contraception a woman may be using at a certain age does not mean it is easy to predict which method of contraception she may be using one, two or three years later. Ensuring choices are available for women is essential.
- In the generation of women born 1973-78, the OCP and condoms were the most prevalent contraception used.
- Use of LARC methods (which for the 1973-78 cohort analyses combined the hormonal IUD, copper IUD, implant, injection and vaginal ring) more than doubles as women age, increasing from 10% when first asked (when women were 28 to 33 years) to 24% (when they were 40 to 45 years).

SOCIOECONOMIC AND HEALTH BEHAVIOUR VARIATIONS IN THE USE OF CONTRACEPTIVES

Use of contraception by women in the 1989-95 cohort by socioeconomic factors

- Women with higher levels of education were more likely to use the OCP and the hormonal IUD, and were less likely to use other contraceptives, and no contraception, compared with women with lower levels of education.
- Women who managed on their available income were more likely to use the OCP, and were less likely to use no contraception, compared with women who found it difficult to manage on their income.

- Women who had never married or were in a de facto relationship were more likely to use the OCP, condoms, the hormonal IUD, and the implant, and were less likely to use no contraception, compared with women who were married.
- Women living in urban areas were more likely to use the OCP, and were less likely to use the implant, hormonal IUD and no contraception compared with women living in remote areas.
- The OCP and the implant were used in higher proportions by women who spoke English. Of interest, use of the OCP was highest in women who spoke an Asian language when they were 40 to 45 years. Women who spoke an Asian or other non-English language were more likely to use condoms, and the implant was also used in higher proportions by women who spoke an Asian language (especially when they were 40 to 45 years). Women who spoke a language other than English were more likely to use no contraception, compared to women who spoke English or an Asian language.

Use of contraception by women in the 1989-95 cohort by health behaviour factors

- Women who consumed high levels of alcohol were more likely to use the hormonal IUD and less likely to use no contraception than women who consumed alcohol at a lower level. Women who were low risk drinkers when they were 18 to 23 years had higher use of the OCP. Women who did not drink has less use of the implant and hormonal IUD when they were 40 to 45 years.
- Women who were physically inactive were more likely to use no contraception and less likely to use the OCP than women who were physically active, even at a low level.
- Women with BMI in the overweight or obese categories reported higher rates of implant use, other contraception, or no contraception (at Survey 1), and were less likely to use the OCP, compared with women who were a healthy weight.
- Women who smoked were more likely to use no contraception and were less likely to use the OCP and condoms (used alone or in combination), compared with women who did not currently smoke.
- Women who used marijuana or illicit drugs were more likely to use no contraception and less likely to use the OCP and condoms (used alone or in

combination), compared with women who reported that they did not use marijuana or illicit drugs.

Use of contraception by women in the 1973-78 cohort by socioeconomic factors

- Women who were married or in a de facto relationship were more likely to use the OCP and condoms (used alone or in combination). Use of LARCs was highest in women who were married or separated/divorced/widowed. Women who had never married or were separated/divorced/widowed were more likely to use condoms or no contraception.
- Women living in urban areas were more likely to use no contraception and less likely to use the OCP and LARCs (at Survey 8), compared with women living in remote areas.
- The OCP was used in higher proportions by women who spoke English, whereas condom use, the withdrawal method, and no contraception were reported in higher proportions by women who spoke a European language. Women who spoke an Asian language had lower use of LARCs.

Use of contraception by women in the 1973-78 cohort by health behaviour factors

- Women who consumed high levels of alcohol were less likely to use the OCP and no contraception, and were more likely to use condoms, compared with women who consumed lower levels of alcohol.
- Women who were physically inactive reported lower rates of OCP and condom use than women who were active.
- Women with BMI in the overweight or obese categories were more likely to report no use of contraception but were less likely to use the OCP than with women who were a healthy weight. Underweight women at Survey 8 (40 to 45 years) had less use of LARCs.
- Women who smoked were less likely to use no contraception and the OCP than women who reported they did not currently smoke.
- Women who used illicit drugs were less likely to use the withdrawal method and more likely to use no contraception, compared with women who reported they did not use illicit drugs.

THE USE OF CONTRACEPTIVES FOLLOWING REPRODUCTIVE EVENTS

Women in the 1989-95 cohort

- Women who had no children or other reproductive events were more likely to primarily use the OCP and condoms during their twenties.
- Women with one child were more likely to use no contraception than the OCP or condoms when they were aged 19 to 30 years.
- Women with two children were generally equally likely to use the OCP, condoms, or no contraception when they were aged 19 to 30 years.
- Women who had experienced a miscarriage were generally equally likely to use the OCP, condoms, or no contraception between the ages of 18 and 25 years, but were more likely to use no contraception after that.
- Women who had experienced a termination when aged 18-23 years were more likely to report using LARC when they were aged 19-24 years. They had generally higher use of the OCP until they were 25 years, and higher use of condoms across all the surveys. Around 30% of women reported using no contraception when they were 24 to 30 years.

Women in the 1973-78 cohort

- Women who had no children were more likely to primarily use the OCP and condoms until in their mid-thirties when they were then more likely to use no contraception.
- Women with one child were most likely to use the OCP until they were aged 28 to 33 years. After this time, rates of no contraception use increased.
- Women with two children were more likely to use the OCP and condoms until they were 34 to 39 years, after which time, their use of LARC increased. Women in this category were most likely to use no contraception when they were 25 to 30 years.
- Women with three or more children were more likely to not use any contraception until they were 28 to 33 years. After this time, rates of OCP and condom remained the same and use of LARC increased.
- Women who had experienced a miscarriage were generally equally likely to use the OCP, condoms, or no contraception between the ages of 18 and 36 years, and were more likely to use no contraception after this time.

- Women's use of OCP following termination (compared with use following live birth or miscarriage) was higher in all surveys from age 18-23 to 28-33, use of LARC was higher from age 31-36 to 34-39, and use of fertility awareness methods was lower from age 31 onwards.

TRENDS IN WOMEN'S USE OF LARC

- 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 (defined as the hormonal IUD, copper IUD or implant) 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.

Women in the 1989-95 cohort

- The older women were, the less likely they were 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 in the underweight BMI category were less likely to use LARC, and women in the obese category were more likely to use LARC, compared with women in healthy weight categories.
- 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.

Women 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.

SHORT AND LONG TERM USE OF THE OCP

- For women born 1989-95 and 1973-78, around 50% of OCP use periods involved a single script. Women may have switched to another OCP not listed on the PBS, or may have transitioned to another form of contraception (e.g., LARC), or ceased using contraception.
- One third (35%) of women born 1989-95 only used OCPs for short periods of time (150 days or less).
- Women born 1989-95 who used an OCP in the short-term were more likely to have a certificate/diploma (although similar numbers had a university degree), to be partnered, and to have previously been in a violent relationship than women who used an OCP in the long-term (>150 days).
- Compared to women born 1989-95 who used an OCP in the long-term (>150 days), those who used an OCP in the short-term were more likely to be

psychologically distressed, to have poor to fair general health, to report a chronic condition, and to have had a previous miscarriage or termination.

- Women born 1989-95 who used an OCP for a short period of time were more likely to smoke tobacco, be non-drinkers, and have a slightly higher BMI than women who used OCP for a long period of time (>150 days).
- In the 1973-78 cohort, 38% of women only used OCPs in the short-term (150 days or less).
- Where women used the OCP for longer than 150 days (long-term use), the median length of OCP use was 503 days for women in the 1989-95 cohort, and 575 days for women in the 1973-78 cohort.
- Among women in the 1989-95 cohort who used an OCP in the long-term, duration of OCP use was shorter for women who were older, had a higher BMI, or who smoked or used illicit drugs.
- Among women in the 1973-78 cohort who used an OCP in the long-term, duration of use of OCP was shorter for women who had poorer mental health, did not live in outer regional or remote areas, had been in a violent relationship, or had endometriosis or PCOS.
- PBS data may underestimate OCP use, since not all OCPs are covered by the PBS. However, the difference in OCP users identified through the PBS and those who report OCP use in the ALSWH surveys with no PBS records for OCP use are small. The main differences appear to be that the PBS OCP data may slightly over-represent women who have more children and more socio-economic disadvantage.

PATTERNS OF PREGNANCY AND ART

Reproductive outcomes

- Among women born 1989-95 (aged up to 30 years) who completed one of the two most recent surveys (N = 10,103), 14% have reported giving birth, 7% have reported a miscarriage, and the average birth rate was 1.5.
- Among women born 1973-78 (aged up to 45 years) who completed one of the two most recent surveys (N = 8,149), 81% have reported giving birth, 36% have reported a miscarriage, and the average birth rate was 2.3.

Reproductive health problems

- Among women in the 1989-95 cohort who had completed one of the two most recent surveys, 10% reported endometriosis and 15% reported PCOS.
- Among women in the 1973-78 cohort who had completed one of the two most recent surveys, 12% reported endometriosis and 9% reported PCOS.

Pregnancy intentions

- At the most recent survey when aged 24-30 years, one in ten women from the 1989-95 cohort reported that they were pregnant or trying to conceive.
- Among women from the 1973-78 cohort, one in five women reported that they were pregnant or trying to conceive when aged 28-33 years (Survey 4), compared to 4% when aged 40-45 years at Survey 8 (2018)
- Women who were pregnant reported better health behaviours (higher fruit consumption, less likely to be in the obese BMI category, smoked less) than those who were not pregnant. However, there was no difference in health behaviours between women who were trying to conceive and those who were not trying to conceive.
- Women who were trying to conceive had the highest prevalence of reproductive health problems including endometriosis (1973-78 cohort) and PCOS (1989-95 and 1973-78 cohorts), compared to those who were pregnant or not trying to conceive.

Fertility issues

- At age 24-30, 6% of women born 1989-95 reported fertility issues.
- For women born 1973-78, the percentage ever reporting fertility issues increased from 4% at 22-27 years to 24% at 40-45 years. One in three women who completed one of the two most recent surveys reported fertility issues at some point, and 76% of these had sought help for fertility issues.
- The prevalence of fertility issues was similar at equivalent ages for women born 1989-95 and 1973-78, however, seeking help was more common in the 1973-78 cohort.

ART

- MBS data indicated 7,137 treatment cycles for 1,537 women (215 from the 1989-95 cohort and 1,322 from the 1973-78 cohort).
- For those women who have accessed ART so far, the number of cycles ranged from 1 to 36 cycles, with an average of 4.6 cycles per woman. Most women (72%) had accessed IVF only, rather than IUI.
- Women born 1989-95 who engaged with ART services early in their reproductive life (aged 17-24) were less likely to have a partner compared to women who engaged ART services later in life.
- Women born 1973-78 who engaged with ART services late in their reproductive life (aged 40-45) were less likely to have a partner than women who engaged ART services earlier in life.
- Women who engaged with ART services late in their reproductive life (aged 40-45; 1973-78 cohort) tended to report that they had not given birth by 40-45 years.
- Overall, the 1989-95 cohort started ART sooner and used it at higher rates when compared to the 1973-78 cohort.
- The prevalence of reproductive health problems was high among women accessing ART services, with 25% of women born 1989-95 and 1973-78 reporting endometriosis, 20% of women born 1973-78 reporting PCOS, and 42% of women born 1989-95 reporting PCOS. Slightly more women with endometriosis used both IVF and IUI, and more women with PCOS used IUI.
- Women who undertook a higher number of ART cycles tended to have endometriosis, had not given birth prior to starting ART treatment, and reported one rather than two or more births across all surveys (note that births cannot be tied to ART).

PERINATAL MENTAL HEALTH

- Rates of screening for perinatal mental health have increased, with 85% of women born 1973-78 reporting being screened in 2009, compared to 91% of women in 2018.
- Women born 1989-95 with no formal qualifications were less likely to report being screened for perinatal mental health issues than those women with higher qualifications.
- Women born 1989-95 have higher rates of perinatal depression and anxiety than women born 1973-78.
- For women born 1989-95 and 1973-78, postnatal diagnoses for depression and anxiety were more common than antenatal diagnoses.
- Among first births, 46% of women born 1989-95 and 37% of women born 1973-78 experienced a traumatic birth (emergency caesarean, labour lasting more than 36 hours, emotional distress during labour, or stillbirth).
- For women born 1989-95 and 1973-78, traumatic birth experiences were associated with an increase in the risk of perinatal depression or anxiety, even after controlling for selected sociodemographic factors and history of mental health issues (OR = 1.74 (95%CI = 1.30, 2.33) and OR = 1.63 (95%CI = 1.40, 1.88), respectively).

MENOPAUSE

Natural menopause

- In the 1946-51 cohort, 90% of women reached natural menopause by age 55, with an average age at 50.9 years. However, 1.3% experienced premature menopause (<40 years), and 5.8% experienced early menopause (40-44 years).
- Women who were less educated, separated/ divorced/ single, reported finding income management difficult all the time and were more likely to have menopause at an earlier age.
- In the 1973-78 cohort, almost 10% of women had reached menopause by age 40-45 years, and 20% had entered perimenopause.

- Cigarette smoking, being underweight, early age at menarche (≤ 11 years), and nulliparity/low parity were associated with an increased risk of premature and early menopause. Smokers who quit smoking for more than ten years prior to the menopause can minimise this risk.
- Women with premature menopause or a very short reproductive lifespan (< 30 years) had an increased risk of non-fatal CVD, especially early onset CVD events before age 60.

Hysterectomy and oophorectomy

- In the 1946-51 cohort, 37.9% of women had a hysterectomy and/or oophorectomy by age 68-73 years – 12.6% reported a hysterectomy with bilateral oophorectomy (surgical menopause). The average age at hysterectomy was 46.3 years, with one third occurring before age 45.
- In the 1973-78 cohort, 5.7% of women had undergone a hysterectomy and/or oophorectomy by age 40-45 years – 0.8% reported a hysterectomy with bilateral oophorectomy.
- Earlier surgical menopause before age 45 poses an additional risk of CVD, compared with natural menopause at the same age.
- Women with hysterectomy/oophorectomy were at a higher risk of type 2 diabetes in both normal weight and overweight/obese groups.
- Hysterectomy with ovarian conservation before age 50 did not increase the risk of all-cause mortality, compared with the no hysterectomy group. However, hysterectomy with bilateral oophorectomy before age 50 and no use of hormone therapy led to an increased risk of premature mortality.

VMS

- In the 1946-51 cohort, almost 25% of women experienced hot flushes often at age 50-58 years, and 5.8% experienced hot flushes often at age 68-73.
- Five symptom profiles of hot flushes were identified throughout the course of over 20 years (45-73 years): minimal (62.2%), later onset, resolved (17.4%), early onset (10.8%), later onset, not resolved (5.9%), and persistent (3.3%). The 'persistent' and 'later onset, not resolved' groups still experienced hot flushes at age 68-73 years. Similar results were found for night sweats.

- Three in four women who experienced hot flushes often sought help at age 45-50, with help seeking decreasing over time to 25% at age 59-64. Of these women, 20-25% reported they were not satisfied with the help given.
- In the 1973-78 cohort, less than 3% of women reported that they experienced hot flushes often at age 37-45 years. However, help-seeking among those women rose from 30.7% at age 37-42 to 41.3% at age 40-45.
- Cigarette smoking, being in overweight/obese BMI categories, and high fat-sugar diet were associated with a higher risk of VMS, while high intakes of soy products, fruit, and Mediterranean diet were associated with a lower risk of VMS. Women who quit smoking before age 40 had a similar level of risk as never smokers.
- Both hot flushes and night sweats were associated with increased risk of CVD, especially those experiencing both symptoms often.

MHT

- In the 1946-51 cohort, the use of MHT peaked at age 50-55 years (32.6%), with 7.3% still taking MHT at age 68-73 years. Among women taking MHT at age 45-50, 52.4% reported a hysterectomy and/or bilateral oophorectomy.
- In the 1973-78 cohort, 1.4% reported currently taking MHT at age 40-45 years. Of these, 40.2% reported a hysterectomy and/or bilateral oophorectomy.

FAMILY PLANNING AND USE OF CONTRACEPTIVES DURING THE COVID-19 PANDEMIC

Quantitative findings

- 10% of women aged 25-31 years changed their pregnancy plans during the pandemic, compared to less than 1% of women aged 42-47 years.
- 11% of women aged 25-31 years were either pregnant or trying to fall pregnant, compared to 2% of women aged 42-47 years.
- 14% of women aged 25-31 years and 3% of women aged 42-47 years indicated that their contraception use had changed since the pandemic began.
- Very few women reported difficulties in accessing contraception during the pandemic.

Qualitative findings

- The pandemic introduced challenges in accessing reproductive health services and adhering to regular contraceptive methods.
- Women described changes to sexual activity during the pandemic, such as having limited opportunities for sexual activity, or a reduced interest in sex.
- Women wrote of limited maternal health service use, economic instability, additional stress, and uncertainty as reasons contributing to their change of mind on pregnancy and having children.

1. INTRODUCTION

ALSWH is an ongoing, nation-wide cohort study, investigating factors influencing the health and wellbeing of Australian women. The study began in 1996 and now includes data from more than 57,000 women across four age cohorts (born 1921-26, 1946-51, 1973-78, and 1989-95). ALSWH collects data on women's physical and mental health, as well as demographics, health behaviours, lifestyle factors, social circumstances, and use of health services. In addition, ALSWH data are linked with national and state-based administrative health datasets, such as the MBS, PBS, hospital admission, perinatal, and cancer registry datasets.

In 1996, the 1973-78, 1946-51, and 1921-26 cohorts were randomly selected from the Medicare database and recruited via mailed surveys (Brown et al., 1996; Brown et al., 1998). The three original cohorts were selected in order to follow women through life stages which are critical to women's health and well-being. Sampling from the population was random within each age group, except that women from rural and remote areas were sampled at twice the rate of women in urban areas. This was done so that numbers of women living outside major urban areas were sufficient for statistical comparisons based on location. In 2013, a new cohort of women aged 18-23 (born 1989-95) was recruited using traditional methods (e.g. referral, print and commercial media), social media, and social marketing campaigns (Loxton et al., 2015). More than 17,000 women enrolled in the 1989-95 cohort.

The ALSWH cohorts have been compared with Australian Census data for women of the same age and have been found to be broadly representative of Australian women of the same age, with some over-representation of tertiary educated women and some under-representation of women from non-English speaking backgrounds (Dobson et al., 2015; Mishra et al., 2014; Loxton et al., 2018). For information on retention of the 1946-51, 1973-78, and 1989-95 ALSWH cohorts, see [Appendix 11.1](#).

1.1 Report aims

This aims of this report are to:

- Describe the uptake, and factors that are related to the uptake, of different methods of contraception, including in-depth examinations of LARC and OCP use.
- Determine patterns of pregnancy and examine issues related to pregnancy including fertility problems, ART, and perinatal mental health.
- Consolidate and update findings concerning the menopause transition and describe the impact of age at menopause and menopausal symptoms on health outcomes.
- Describe the impact of COVID-19 on family planning and contraceptive choices during 2020.

This report has been prepared in consultation with the Australian Government Department of Health and other stakeholders to focus on key research topics about women's reproductive health.

1.2 Women's reproductive history: A snapshot

At the first ALSWH survey in 1996, the majority (91.8%) of women in the 1946-51 cohort (then aged 45-50) reported that they had given birth. Of the women who had reported giving birth (N = 11,953), 9.6% reported one birth only, 41.7% reported two births, 30.8% reported three births, and 17.9% reported giving birth four times or more. For women from the 1946-51 cohort, the average age of menopause was 50.9 years, with 90% of women reporting that menopause occurred when they were 43 to 57 years old. Menopause due to surgery (removal of both ovaries) was indicated by 12% of women.

Of the 14,247 women in the 1973-78 cohort, a total of 19,309 births (including 128 stillbirths) have been reported by 8,627 women to date, giving a birth rate of 2.24 per woman. The average age of women when they first gave birth was 28.7 years (IQR = 25.0 – 32.4). Across all births, the average maternal age was 30.2 years (IQR = 26.7 – 34.1). At Survey 8 in 2018 (when aged 40-45), four out of five women (80.5%) from the 1973-78 cohort had reported giving birth. Half of these women (50.8%) reported

two births, one quarter (24.1%) reported three births, with 16.8% reporting one birth only and 8.3% reporting four or more births. Also at this survey (when aged 40-45), around 15% of women indicated that they had not had a period or any menstrual bleeding for at least 12 months.

Of the 17,010 women in the 1989-95 cohort, a total of 2,776 births (including 31 stillbirths) have been reported by 1,819 women to date, giving a birth rate of 1.5 per woman. The average age of women when they first gave birth was 22.7 (IQR = 20.0 – 26.0). Across all births reported so far, the average maternal age was 23.2 years (IQR = 21.0 – 26.0). At Survey 6 in 2019, 15% of women from the 1989-95 cohort (aged 24-30) had reported giving birth. Just over half of these women (58.4%) reported one birth, nearly a third (31.6%) reported two births, 8.2% reported three births, and 1.8% reported four or more births.

1.3 Report outline

This report examines both cross-sectional and longitudinal data, and reports general trends observed across the 1989-95, 1973-78, and 1946-51 ALSWH cohorts, using both survey data and linked administrative datasets (MBS, PBS, and the state-based perinatal data collections), where appropriate. An outline of each chapter is provided below.

[Chapter 2](#) reports on the prevalence of different contraceptive methods across the reproductive life for women in the 1989-95 and 1973-78 cohorts using survey data. This chapter also explores transitions in use of contraceptive methods for women in the 1989-95 cohort. The sociodemographic and health behaviour variations in contraceptive use are described in [Chapter 3](#), using survey data from the 1989-95 and 1973-78 cohorts.

Reproductive events in relation to contraceptive use are described in [Chapter 4](#), using survey data from the 1989-95 and 1973-78 cohorts. [Chapter 5](#) outlines trends in the use of LARCs (defined as the hormonal IUD, copper IUD and implant). This chapter includes survey data from the 1989-95 and 1973-78 cohorts linked with MBS and PBS data. [Chapter 6](#) examines the long-term use of oral contraceptives, and includes a comparison of trends in use over time and across women born 1973-78 and 1989-95.

This chapter includes analyses of survey data from the 1989-95 and 1973-78 cohorts linked with PBS data.

Patterns of reproductive outcomes, reproductive health problems, pregnancy intentions, fertility problems, and use of ART are described in [Chapter 7](#). This chapter includes survey and linked MBS data from the 1989-95 and 1973-78 cohorts. [Chapter 8](#) describes the prevalence of anxiety and depression in the perinatal period in the 1989-95 and 1973-78 cohorts. This chapter also reports on perinatal mental health screening rates in these two cohorts over time, and experiences of traumatic births.

[Chapter 9](#) reports on experiences of menopause using survey data from the 1973-78 and 1946-51 cohorts. This chapter describes findings on natural menopause, hysterectomy and oophorectomy, VMS, and the use of menopausal hormonal therapy.

Family planning and contraceptive use during the COVID-19 pandemic are explored in [Chapter 10](#) using COVID-19 survey data from the 1989-95 and 1973-78 cohorts. This chapter also includes qualitative analysis of free text comments on reproductive health experiences during the COVID-19 crisis, and the impacts of the pandemic on reproductive health.

This report can be read from beginning to end but you can also dip into each chapter as a stand-alone document.

For information about the prevalence of different types of contraception women have used at different times and ages, see [Chapter 2](#).

If you would like to know more about use of contraception, such as the socioeconomic status or health behaviour of women using different types of contraception, see [Chapter 3](#).

To find out more about the impact of reproductive health events on the uptake of different contraceptives, see [Chapter 4](#).

For an in-depth examination of LARC use, including details of socioeconomic and health behaviour characteristics that are related to LARC use as reported in MBS and PBS data, see [Chapter 5](#).

For a detailed analysis of OCP use as captured by PBS data, and the factors that are related to long-term OCP use, see [Chapter 6](#).

To find information about pregnancy patterns, fertility issues and use of ART, see [Chapter 7](#).

To find out about perinatal mental health, including screening, prevalence and risk factors for ante- and postnatal depression and anxiety, see [Chapter 8](#).

If you would like to know more about menopause, hysterectomy, and menopausal symptoms and their relationship with health outcomes, see [Chapter 9](#).

For information about the impact of the COVID-19 pandemic on women's family planning and contraceptive choices during 2020, including a qualitative analysis of their lived experience, see [Chapter 10](#).

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2. PREVALENCE OF CONTRACEPTIVE USE ACROSS THE REPRODUCTIVE LIFESPAN

Authors: Leigh Tooth, Richard Hockey

2.1 Key points

- The OCP (including the combined OCP and mini-pill) and condoms are the most common forms of contraception used among women born 1989-95.
- Use of the OCP and condoms is highest when women are in their late teens and early twenties, then declines as they enter their mid- to late twenties.
- Use of the LARC implant, is reported by around 10% of young women, while use of the hormonal IUD increases as women enter their mid- to late twenties.
- There was a reduction in use of contraception as women entered their mid- to late twenties, most likely reflecting the desire to have children.
- Simple prevalence figures on contraception use by women born 1989-95 do not reflect the highly transitional nature of contraception use. Knowing what contraception a woman may be using at a certain age does not mean it is easy to predict which method of contraception she may be using one, two or three years later. Ensuring choices are available for women is essential.
- In the generation of women born 1973-78, the OCP and condoms were the most prevalent contraception used.
- Use of LARC methods (defined as non-daily methods such as the hormonal IUD, copper IUD, implant, injection and vaginal ring) more than doubles as women age, increasing from 10% when first asked (when women were 28 to 33 years) to 24% (when they were 40 to 45 years).

2.2 Introduction

This chapter reports on the prevalence of each contraceptive method across the reproductive life by women in the 1989-95 and 1973-78 cohorts. It further shows transitions in use of contraceptive methods by women in the 1989-95 cohort. The chapter concludes with a summary of relevant previously published research that used ALSWH data.

Table 2-1 summarises the contraceptive methods captured in the ALSWH surveys for the two cohorts. Details of the questions used and their measurement are included in [Appendix 11.2.1](#). In this chapter, a LARC is defined as any non-daily method of contraception (i.e., the hormonal IUD, copper IUD, implant, injection and vaginal ring) for the 1973-78 cohort and as the implant and hormonal IUD for the 1989-95 cohort.

Table 2-1 Contraceptive methods asked in surveys of the 1989-95 and 1973-78 cohorts.

1989-95 cohort	1973-78 cohort
The pill	OCP (OCP and mini pill)
Condoms	Condoms
Implant (e.g. Implanon)	Withdrawal
Hormonal IUD (e.g. Mirena)	LARCs:
Other contraceptive	<ul style="list-style-type: none"> • Injection • Hormonal and copper IUDs • Vaginal ring • Implant
None	Safe (fertility awareness) period method
	Emergency contraception
	None

2.3 Use of contraceptive methods by women in the 1989-95 cohort

As described above and in [Appendix 11.2.1](#), the questions asked of the 1989-95 cohort at each survey are in relation to the contraception method used the last time the women had vaginal sex (defined as penis in vagina sex). Figure 2-1 shows the prevalence of use of different contraceptive methods across surveys. The graph

excludes data where women had a tubal sterilisation, were unable to get pregnant, were currently pregnant, had a hysterectomy, or their partner had a vasectomy (see [Appendix 11.2.1](#) for more information). The most common methods of contraception used by women aged from 18 to 30 years were the OCP and condoms. Use of the OCP decreased from 60% to 34%, and use of condoms decreased from 45% to 31% of women, over the five surveys. It is important to note that condoms can be used for either pregnancy prevention, STI protection, or both. The prevalence of use of the implant across the surveys was constant at around 10%, while use of the hormonal IUD increased from 2% of women at Survey 1 to 13% at Survey 6. When the women were aged between 18 to 23 years, 9% reported they did not use contraception. This percentage rose to around 21% by the time the women were aged 24 to 30 years. Prevalence of use of other contraceptives remained steady at between 3% to 5% across surveys.

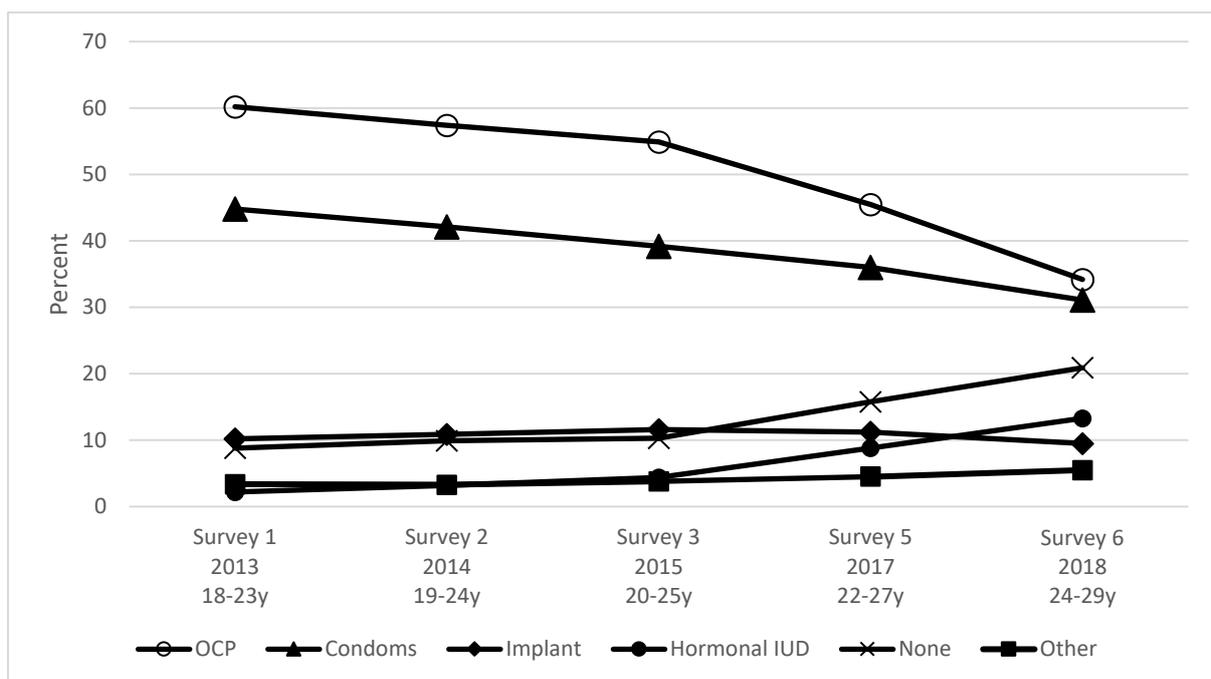


Figure 2-1 Prevalence of contraception methods used by women in the 1989-95 cohort from Survey 1 to Survey 6.

The transition plot in Figure 2-2 shows the changeable nature of contraceptive method use by women early in their reproductive lifespan (between the ages of 18 and 30).

This first column shows the percentage of women using each of the different types of contraception at Survey 1. For example, women using no contraception are represented by the band at the very bottom. The subsequent bands further up the column represent women using the OCP, condoms, long acting methods, and other forms of contraception. The column percentages do not exactly equal those presented in Figure 2-1 because the transition plot uses a discreet category at each time point (if the women reported using more than one type of contraception, only one was selected at each time point). By Survey 2 changes in the type of contraception used are evident. For example, some women who were using the OCP at Survey 1 had changed to condoms or long acting methods at Survey 2. Over the next three surveys, many more transitions occurred. It is apparent from this data that women frequently change the type of contraception they use over time, and that a range of contraception options need to be available.

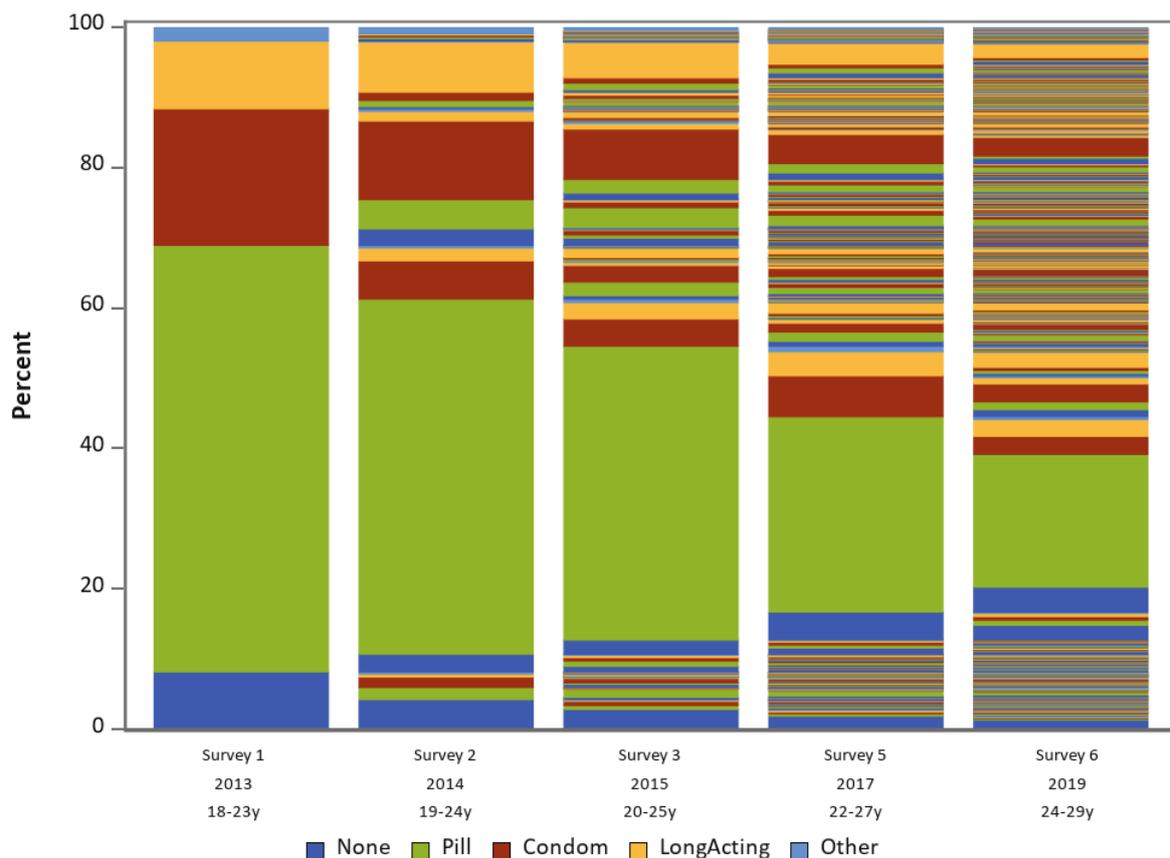


Figure 2-2 Transition plot of use of contraception used by women in the 1989-95 cohort between Survey 1 and 6.

2.4 Use of contraceptive methods by women in the 1973-78 cohort

Figure 2-3 shows the prevalence of the use of different contraceptive methods across surveys for women in the 1973-78 cohort (see [Appendix 11.2.1](#) for more information). The graph excludes data where women had a tubal sterilisation, were unable to get pregnant, were currently pregnant, had a hysterectomy, or where their partner had a vasectomy. In the 1973-78 cohort, the OCP and condoms were the most prevalent types of contraception used when women were aged from their late teens to mid-thirties. Use of OCP peaked when women were in their mid- to late twenties, when this method was used by around 55% of women, which was more than double the prevalence of condom use. As women aged, prevalence of OCP use dropped more sharply than the use of condoms, with the prevalence of both reaching around 20% as women reached their late thirties to mid-forties. The percentage of women reporting no contraception use was around 30% when women were in their late teens and early twenties, but this prevalence decreased to around 20% until women were in their early thirties, and then increased to around 27% when they were aged 40 to 45 years. Use of LARCs was 11% at Survey 5, when the women were aged 31 to 36 years. This was the first time this cohort was asked about LARC use. Over the next three surveys (covering a period of approximately 10 years), LARC use doubled to 24%. Use of the withdrawal method remained steady between the ages of 28 to 33 and 40 to 45, at around 11% (this method was not asked about in earlier surveys). Use of the emergency OCP (<1.4%) and fertility awareness period method (<6%) were the least reported methods of contraception at all ages where this was included in survey items.

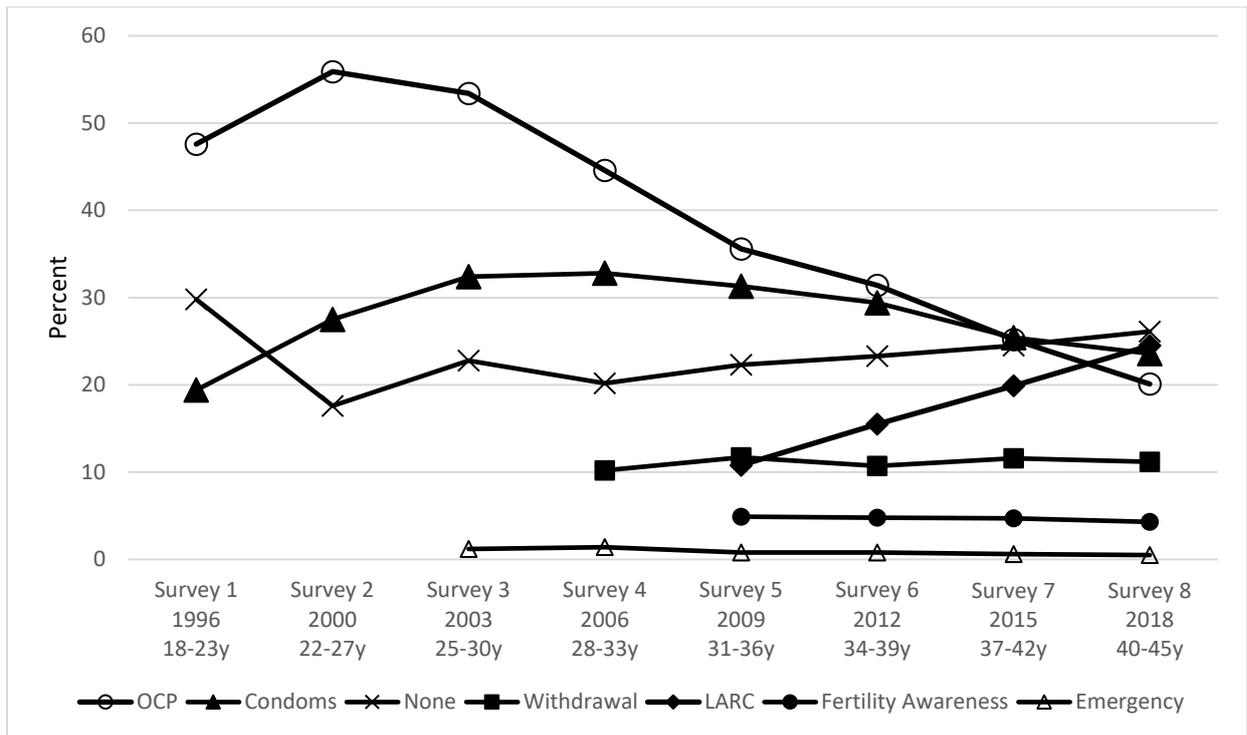


Figure 2-3 Prevalence of contraception methods used by women in the 1973-78 cohort from Survey 1 to Survey 8.

2.5 An overview of previously published ALSWH research examining prevalence of contraception use

Several authors have examined contraceptive use by women in the ALSWH 1973-78 cohort. A brief summary of the key findings from studies over the past 10 years and their implications for policy is presented here.

In a 2018 paper, Steel et al. examined whether women’s use of complementary medicine interventions or consultations with complementary medicine practitioners were associated with their choice of contraceptive method. The study used survey data from 7,299 women in the 1973-78 cohort, when they were aged between 34 and 39 years. The authors found no consistent pattern between use of complementary medicine and contraceptive use. Women who consulted a naturopath or herbalist were less likely to use implant contraceptives (OR 0.56; 95%CI 0.33; 0.95), and women consulting a chiropractor (OR 1.54; 95%CI 1.05; 2.25) or an osteopath (OR 2.16; 95% CI 1.32; 3.54) were more likely to use natural contraception. The authors concluded

that there is a need for policy makers to better understand the approach of complementary medicine practitioners, and to ensure the family planning advice they provide is evidence-based.

2.6 Women's experiences in obtaining and using contraception

Free text comments written by women in the 1973-78 cohort about their experiences in obtaining and using contraception over five surveys were analysed by Dixon and colleagues (2014). The 289 women in this analysis were aged between 18 and 36. Five major themes were identified as relating to the women's experiences of barriers to access and optimal contraceptive use. The first and most commonly reported theme was side effects (either experienced or perceived), affecting both physical (e.g., weight gain and heavy periods) and mental health (e.g., depression and mood swings). Women reported being upset they were not warned about these potential side effects and that experiencing them influenced their willingness to continue using hormonal contraception. The second theme, predominantly expressed by younger women, was lack of information about contraception. Examples included women not being told use of the OCP could lead to depression, or the amount of time it might take for the effects of hormonal implants to wear off after removal. The third theme encompassed negative experiences with health services, for example women feeling they were being judged and not offered access to their preferred contraceptive. Another common issue was women feeling uncomfortable dealing with male health providers regarding contraception and gynaecological issues. The fourth theme concerned women's lack of confidence that the contraceptive method would work and actual contraceptive failure (leading to unintended pregnancy and termination). The final theme was difficulty with access to contraception, which was a consistent theme across all ages. Women wrote about not being given a contraceptive script unless they agreed to have a pap smear, of difficulty finding bulk billing doctors and the cost. The authors recommended that health practitioners inform women about side effects, monitor women more effectively, routinely provide information packs, and be aware of how their professional manner may affect women and their choices.

A number of researchers have used ALSWH data to examine contraceptive use associated with other reproductive events or health issues.

Joham et al. (2014) found that women from the 1973-78 cohort aged 28-33 with PCOS were less likely to be using contraception (61% versus 79%) and more likely to be trying to conceive (56% versus 45%), compared with women not reporting PCOS. The authors suggested that women reporting PCOS may be aware that PCOS can impact fertility, hence their low use of contraception. However, they also argued that for women with PCOS who do not intend to conceive yet and who are not using contraception - perhaps because of a belief that they have low fertility - that education informing them of their chances of conception is required.

Research by Tu and colleagues (2014) examined whether prior oral contraceptive use was associated with future diagnosis of endometriosis. The study used data from 9,585 women aged 18 to 23 at baseline who were followed up for nine years. The association between oral contraceptive use and endometriosis was found to be influenced by parity – the number of times a woman has given birth.

- Of women who had never had a child, those who used oral contraceptives had almost twice the risk of being diagnosed with endometriosis compared with women who had never used oral contraceptives, with the risk slightly higher the longer they had used the oral contraceptives. One explanation may be that OCP is frequently prescribed for the management of symptoms of endometriosis (Donnez & Dolmans, 2021).
- In contrast, for women who had had at least one child and used oral contraceptives, the risk of being diagnosed with endometriosis was reduced by over 50% (compared with the risk in women who had never used oral contraceptives). This may reflect that women experiencing difficulty in falling pregnant may undergo fertility investigations and hence increase their chance of being diagnosed with endometriosis.

Lucke and colleagues (2011) examined changes in contraception use after reproductive events such as birth, miscarriage or termination, among 5,631 Australian women aged between 18 and 36, of the 1973-78 cohort. The aim was to identify potential opportunities to increase the effectiveness of contraceptive information and service provision. The analyses assessed the associations between reproductive events (birth only, birth and miscarriage, miscarriage only, termination only, other

multiple events, and no new event) and subsequent changes in contraceptive use (start using, stop using, switch method), compared with women who continued to use the same method of contraception. Lucke et al. found women were more likely to start using contraception only after experiencing a birth, or a birth and a miscarriage, whereas, women who experienced miscarriages were more likely to stop using contraception. Women who experienced terminations were more likely to switch contraception methods. There was a significant interaction between reproductive events and time, indicating more changes in contraceptive use as women reach their mid-thirties. The authors concluded that contraceptive use increasing after the birth of a child, but decreasing after miscarriage indicates the intention for family formation and spacing between children. Switching contraceptive methods after termination suggests these pregnancies were unintended and possibly due to contraceptive failure. Women's contact with health professionals around the time of reproductive events provides an opportunity for health care providers to provide best practice contraceptive services, review contraceptive needs, and discuss new or emerging contraceptive technologies.

2.7 Summary

This chapter presented the prevalence of different types of contraception by women in Australia. Data came from two cohorts: those born 1989-95, who were surveyed annually from 2013 to 2019, and who were aged between 18 and 30 years over the course of the surveys; and those born 1973-78, who were surveyed eight times between 1996 and 2018, and who were aged from 18 to 45 years across the surveys. In young women of both generations, OCP and condoms were the most prevalent type of contraception used until women entered their mid- to late twenties, where the proportion of women reporting they were not using contraception started to increase, likely reflecting pregnancy and pregnancy planning. The data showed that the use of LARC is more prevalent in women from the most recent generation (1989-95 cohort), but that LARC use in women increases rapidly as women enter their late thirties and forties. LARC use is examined in detail in [Chapter 5](#) which includes an analysis of LARC use among women born 1989-95 and 1973-78 using linked PBS data.

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3. SOCIOECONOMIC AND HEALTH BEHAVIOUR VARIATIONS IN THE USE OF CONTRACEPTIVES

Authors: Leigh Tooth, Richard Hockey

3.1 Key points

Use of contraception by women in the 1989-95 cohort by socioeconomic factors

- Women with higher levels of education were more likely to use the OCP (including the combined OCP and mini-pill) and hormonal IUD, and were less likely to use other contraceptives, and no contraception, compared with women with lower levels of education.
- Women who managed on their available income were more likely to use the OCP, and were less likely to use no contraception, compared with women who found it difficult to manage on their income.
- Women who had never married or were in a de facto relationship were more likely to use the OCP, condoms, hormonal IUD, and the implant, and were less likely to use no contraception, compared with women who were married.
- Women living in urban areas were more likely to use the OCP, and were less likely to use the implant, hormonal IUD and no contraception compared with women living in remote areas.
- The OCP and the implant were used in higher proportions by women who spoke English. Of interest use of the OCP was highest in women who spoke an Asian language when they were 40 to 45 years. Women who spoke an Asian or other non-English language were more likely to use condoms, and the implant was also used in higher proportions by women who spoke an Asian language (especially when they were 40 to 45 years). Women who spoke a language other than English were more likely to use no contraception, compared to women who spoke English or an Asian language.

Use of contraception by women in the 1989-95 cohort by health behaviour factors

- Women who consumed high levels of alcohol were more likely to use the hormonal IUD and less likely to use no contraception than women who consumed alcohol at a lower level. Women who were low risk drinkers when they were 18 to 23 years had higher use of the OCP. Women who did not drink has lower use of the implant and hormonal IUD when they were 40 to 45 years.
- Women who were physically inactive were more likely to use no contraception and less likely to use the OCP than women who were physically active, even at a low level.
- Women who were in the BMI overweight or obese ranges reported higher rates of implant use, other contraception, or no contraception (at Survey 1), and were less likely to use the OCP, compared with women who were in the healthy weight range.
- Women who smoked were more likely to use no contraception and were less likely to use the OCP and condoms, compared with women who did not currently smoke.
- Women who used marijuana or illicit drugs were more likely to use no contraception and less likely to use the OCP and condoms, compared with women who reported that they did not use marijuana or illicit drugs.

Use of contraception by women in the 1973-78 cohort by socioeconomic factors

- Women who were married or in a de facto relationship were more likely to use the OCP and condoms. Use of LARCs (defined as any non-daily method such as the hormonal IUD, copper IUD, implant, injection or vaginal ring) was highest in women who were married or separated/divorced/widowed. Women who had never married or were separated/divorced/widowed were more likely to use condoms or no contraception.

- Women living in urban areas were more likely to use no contraception and less likely to use the OCP and LARCs (at Survey 8), compared with women living in remote areas.
- The OCP was used in higher proportions by women who spoke English, whereas condom use, the withdrawal method, and no contraception were reported in higher proportions by women who spoke a European language. Women who spoke an Asian language had less use of LARCs.

Use of contraception by women in the 1973-78 cohort by health behaviour factors

- Women who consumed high levels of alcohol were less likely to use the OCP and no contraception, and were more likely to use condoms, compared with women who consumed lower levels of alcohol.
- Women who were physically inactive reported lower rates of OCP and condom use than women who were active.
- Women with a BMI in the overweight or obese categories were more likely to report no use of contraception but were less likely to use the OCP than women who were in the healthy weight category. Women in the underweight group at Survey 8 (40 to 45 years) had less use of LARCs.
- Women who smoked were less likely to use no contraception and the OCP than women who reported they did not currently smoke.
- Women who used illicit drugs were less likely to use the withdrawal method and more likely to use no contraception, compared with women who reported they did not use illicit drugs.

3.2 Introduction

This chapter describes the socioeconomic and health behaviour characteristics of women who use different types of contraceptives or no contraceptive methods. Data from women born 1989-95 and 1973-78 were used to examine contraceptive use by area of residence, education, marital status, ability to manage on income, workforce participation, country of birth, and language spoken at home. Additionally, contraceptive use by substance use, physical activity, and body weight was examined. This chapter concludes with a summary of relevant previously published research that has used ALSWH data.

3.3 Use of contraception methods by women in the 1989-95 cohort by socioeconomic and health behaviour characteristics

3.3.1 Use of the OCP

[Chapter 2](#) showed how overall prevalence of use of the OCP (including the combined OCP or mini-pill) decreased over time, from 60% in Survey 1 when the women were aged 18 to 23, to 34% in Survey 6, when aged 24 to 30. This section describes how use of the OCP at Survey 1 and Survey 6 differed by socioeconomic characteristics and health risk behaviours. The percentages of women using each type of contraceptive method according to socioeconomic factors and health risk behaviours are shown in Table 3-1 to 3-Table 3-20. Detailed descriptions of these associations at the baseline and most recent surveys can be found in [Appendix 11.3](#).

Table 3-1 Prevalence of OCP use according to socioeconomic factors among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Area of residence		
Major city	60.5	36.1
Inner regional	58.9	30.8
Outer regional	61.8	25.4
Remote/very remote	50.0	30.4

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Highest qualification		
Less than year 12	43.2	24.7
Year 12	62.7	27.6
Certificate/diploma/trade	50.8	28.3
University degree	66.4	37.0
Marital status		
Married	47.7	22.4
Defacto	59.8	37.5
Separated/divorced/widowed	66.7	27.3
Never married	60.9	38.5
Manage on income		
It is easy	59.4	36.0
It is not too bad	64.3	35.4
It is difficult some of the time	59.0	31.8
It is difficult all of the time	57.0	34.9
It is impossible	55.9	21.1
Country of birth		
Australia	60.5	34.3
Other English-speaking country	58.6	33.5
Other	50.5	29.9
Language spoken at home		
English	60.3	34.0
European language	53.8	18.8
Asian language	29.2	39.4
Other language	52.5	27.7

In summary, Table 3-1 shows that use of the OCP was highest at Survey 1 and Survey 6 among women born 1989-95 who lived in urban areas, had a higher level of education, were born in Australia or other English speaking country (only at Survey 1), were either not married, were in a de facto relationship or separated/widowed/divorced,

managed on their available income (at Survey 1) and spoke an Asian language (only at Survey 6) or English at home (only at Survey 1).

Table 3-2 Prevalence of OCP use according to health risk behaviours among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Alcohol consumption		
Low risk drinker	63.2	37.4
Non-drinker	51.0	20.4
Rarely drinks	56.6	31.5
Risky drinker	50.0	37.2
Smoking		
Never smoked	64.0	36.3
Ex-smoker	57.2	24.9
Current smoker	45.9	29.5
Physical activity		
Inactive	51.3	29.2
Low	59.6	30.9
Moderate	61.0	34.9
High	61.0	36.8
BMI Category (kg/m²)		
Underweight (<18.50)	64.0	39.1
Healthy (18.59 - 24.99)	64.1	37.0
Overweight (25.09 - 29.99)	55.0	32.4
Obese (30.00 or more)	44.4	29.3
Use of marijuana^a		
Every day	-	24.0
Once a week or more	-	22.9
About once a month	-	23.6
Every few months	-	33.9
Once or twice a year	-	31.6
Never	-	35.8

^a Use of marijuana only asked at Survey 6

The data in Table 3-2 shows use of the OCP was highest at Survey 1 and Survey 6 among women born 1989-95 who did not currently smoke, were low risk drinkers (at Survey 1) were more physically active, had a lower BMI, and did not use, or had low levels of use, of marijuana or other illicit drugs (Survey 6 only).

3.3.2 Use of condoms

Overall prevalence of condom use decreased over time, from 45% in Survey 1 to 31% in Survey 6. It is important to note that condoms can be used for contraception, STI prevention, or both. The following tables show the associations between condom use at the baseline and most recent surveys according to socioeconomic factors and health risk behaviours (Table 3-3 and Table 3-4). Detailed descriptions of these associations at the baseline and most recent surveys can be found in [Appendix 11.3](#).

Table 3-3 Prevalence of condom use according to socioeconomic factors among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Area of residence		
Major city	44.4	32.1
Inner regional	45.6	29.1
Outer regional	46.3	26.1
Remote/very remote	42.3	31.6
Highest qualification		
Less than year 12	38.5	31.5
Year 12	48.4	27.3
Certificate/diploma/trade	40.1	26.1
University degree	44.2	33.2
Marital status		
Married	29.7	22.5
Defacto	31.2	25.6
Separated/divorced/widowed	33.3	30.9
Never married	49.6	39.8
Manage on income		
It is easy	46.1	32.4

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
It is not too bad	46.5	29.9
It is difficult some of the time	43.4	32.6
It is difficult all of the time	44.6	30.7
It is impossible	42.0	30.0
Country of birth		
Australia	44.8	31.0
Other English-speaking country	44.0	29.5
Other	48.5	41.3
Language spoken at home		
English	44.6	30.8
European language	30.8	31.3
Asian language	62.5	48.5
Other language	57.5	27.7

In summary, Table 3-3 shows that use of condoms was highest at Survey 1 and Survey 6 among women born 1989-95 who were born in a non-English speaking country (mainly at Survey 6), were not married and spoke an Asian or other non-English language at home.

Table 3-4 Prevalence of condom use according to health risk behaviours among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Alcohol consumption		
Low risk drinker	44.9	32.5
Non-drinker	44.4	26.2
Rarely drinks	44.1	30.2
Risky drinker	49.2	27.3
Smoking		
Never smoked	46.5	32.3
Ex-smoker	42.6	27.6
Current smoker	39.5	27.2

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Physical activity		
Inactive	45.3	31.7
Low	42.8	28.2
Moderate	46.3	30.5
High	45.1	33.3
BMI category (kg/m²)		
Underweight (<18.50)	47.9	27.8
Healthy (18.59 - 24.99)	43.6	31.6
Overweight (25.09 - 29.99)	46.0	31.4
Obese (30.00 or more)	47.2	30.6
Use of marijuana^a		
Every day	-	24.0
Once a week or more	-	22.9
About once a month	-	31.5
Every few months	-	27.9
Once or twice a year	-	34.1
Never	-	31.1

^a Use of marijuana only asked at Survey 6

In summary, Table 3-4 shows that use of condoms was highest at Survey 1 and Survey 6 among women born 1989-95 who did not currently smoke, and did not use, or had low levels of use, of marijuana or other illicit drugs.

3.3.3 Use of the implant

Chapter 2 showed how overall prevalence of implant use was largely consistent across the surveys at 10% to 12%. The following tables show the associations between implant use at the baseline and most recent surveys according to socioeconomic factors and health risk behaviours (Table 3-5 and Table 3-6). Detailed descriptions of these associations at the baseline and most recent surveys can be found in [Appendix 11.3](#).

Table 3-5 Prevalence of implant use according to socioeconomic factors among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Area of residence		
Major city	9.3	9.0
Inner regional	12.7	11.4
Outer regional	13.4	9.9
Remote/very remote	11.5	8.9
Highest qualification		
Less than year 12	8.9	9.0
Year 12	10.3	7.9
Certificate/diploma/trade	12.5	9.5
University degree	8.4	9.8
Marital status		
Married	5.8	5.8
Defacto	12.4	10.7
Separated/divorced/widowed	22.2	16.4
Never married	9.7	10.7
Manage on income		
It is easy	11.1	10.1
It is not too bad	8.7	8.9
It is difficult some of the time	10.9	9.5
It is difficult all of the time	10.2	10.4
It is impossible	12.6	13.3
Country of birth		
Australia	10.4	9.9
Other English-speaking country	6.0	6.0
Other	9.7	2.5
Language spoken at home		
English	10.4	9.8
European language	0.0	0.0
Asian language	8.3	15.2
Other language	5.0	10.6

Table 3-5 shows that use of the implant was slightly higher at Survey 1 among women born 1989-95 who lived in regional and remote areas and were born in Australia. Use of the implant was highest at both Survey 1 and Survey 6 among women born 1989-95 who were separated/divorced/widowed and highest at Survey 6 by women who spoke an Asian language.

Table 3-6 Prevalence of implant use according to health risk behaviours among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Alcohol consumption		
Low risk drinker	9.6	10.1
Non-drinker	7.8	4.9
Rarely drinks	11.9	9.9
Risky drinker	9.2	8.3
Smoking		
Never smoked	9.5	9.9
Ex-smoker	10.9	9.0
Current smoker	12.5	8.0
Physical activity		
Inactive	13.2	8.0
Low	11.0	10.2
Moderate	9.3	8.5
High	9.9	9.9
BMI category (kg/m²)		
Underweight (<18.50)	5.3	6.8
Healthy (18.59 - 24.99)	8.7	8.5
Overweight (25.09 - 29.99)	13.1	11.0
Obese (30.00 or more)	16.4	10.9
Use of marijuana^a		
Every day	-	10.7
Once a week or more	-	8.5
About once a month	-	9.5
Every few months	-	9.7
Once or twice a year	-	11.7
Never	-	9.0

^a Use of marijuana only asked at Survey 6

In summary, use of the implant was higher at Survey 1 among women born 1989-95 who were smokers and had a higher BMI (as well as Survey 6).

3.3.4 Use of the hormonal IUD

[Chapter 2](#) showed the overall prevalence of use of the hormonal IUD increased from 2% at Survey 1 to 13% at Survey 6. The following tables show the associations between the hormonal IUD use at the baseline and most recent surveys according to socioeconomic factors and health risk behaviours (Table 3-7 and Table 3-8). Detailed descriptions of how use of the hormonal IUD at Survey 6 differed by socioeconomic and health risk behaviours can be found in [Appendix 11.3](#).

Table 3-7 Prevalence of the hormonal IUD use according to socioeconomic factors among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Area of residence		
Major city	2.3	13.2
Inner regional	1.7	11.1
Outer regional	2.8	16.5
Remote/very remote	3.8	17.7
Highest qualification		
Less than year 12	2.6	6.7
Year 12	1.2	11.5
Certificate/diploma/trade	3.2	12.0
University degree	2.9	14.1
Marital status		
Married	2.3	9.6
Defacto	3.1	15.1
Separated/divorced/widowed	11.1	14.5
Never married	1.9	13.9
Manage on income		
It is easy	1.6	16.3
It is not too bad	1.9	12.4

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
It is difficult some of the time	2.4	11.8
It is difficult all of the time	3.2	13.3
It is impossible	0.7	17.8
Country of birth		
Australia	2.2	13.0
Other English-speaking country	3.9	16.3
Other	0.0	14.9
Language spoken at home		
English	2.3	13.6
European language	0.0	12.5
Asian language	0.0	6.1
Other language	0.0	10.6

The table shows that use of the hormonal IUD was highest at Survey 6 among women born 1989-95 who lived in more remote areas, had higher levels of education, and were either not married or were in a de facto relationship.

Table 3-8 Prevalence of the hormonal IUD use according to health risk behaviours among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Alcohol consumption		
Low risk drinker	2.4	15.4
Non-drinker	0.8	6.0
Rarely drinks	2.1	10.7
Risky drinker	1.5	16.5

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Smoking		
Never smoked	2.0	13.2
Ex-smoker	2.8	13.5
Current smoker	2.6	13.2
Physical activity		
Inactive	2.6	11.4
Low	2.0	12.3
Moderate	2.0	12.8
High	2.4	14.3
BMI category (kg/m²)		
Underweight (<18.50)	2.3	9.8
Healthy (18.59 - 24.99)	1.9	14.0
Overweight (25.09 - 29.99)	2.6	12.1
Obese (30.00 or more)	3.5	13.5
Use of marijuana^a		
Every day	-	10.7
Once a week or more	-	20.3
About once a month	-	18.9
Every few months	-	17.2
Once or twice a year	-	15.1
Never	-	12.2

^a Use of marijuana only asked at Survey 6

In summary, use of the hormonal IUD was highest at Survey 6 among women born 1989-95 who used marijuana weekly or monthly and were low risk or risky drinkers.

3.3.5 Use of no contraception

[Chapter 2](#) explored how the overall prevalence of use of no contraception more than doubled, increasing from 9% when the women were aged between 18 to 23 years to around 21% by the time they were 24 to 30 years, likely reflecting these women becoming pregnant and planning for pregnancy. The following tables show the associations between use of no contraception at the baseline and most recent surveys

according to socioeconomic factors and health risk behaviours (Table 3-9 and Table 3-10). Detailed descriptions of these associations at the baseline and most recent surveys can be found in [Appendix 11.3](#).

Table 3-9 Prevalence of use of no contraception according to socioeconomic factors among women born 1989-95 at their baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Area of residence		
Major city	8.9	19.3
Inner regional	8.3	25.9
Outer regional	8.8	27.4
Remote/very remote	11.5	29.1
Highest qualification		
Less than year 12	20.3	34.8
Year 12	6.9	29.2
Certificate/diploma/trade	13.9	29.8
University degree	5.9	16.8
Marital status		
Married	26.2	41.2
Defacto	9.6	15.8
Separated/divorced/widowed	0.0	21.8
Never married	7.7	13.3
Manage on income		
It is easy	7.8	15.9
It is not too bad	7.5	22.1
It is difficult some of the time	8.8	22.3
It is difficult all of the time	10.6	20.1
It is impossible	13.3	34.4
Country of birth		
Australia	8.8	20.7
Other English-speaking country	8.6	23.9
Other	9.7	24.8

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Language spoken at home		
English	8.9	20.6
European language	15.4	50.0
Asian language	12.5	6.1
Other language	10.0	34.0

The table shows use of no contraception was highest at Survey 1 and Survey 6 among women born 1989-95 who lived in more remote areas, had a lower level of education, were married, had more income stress and spoke a European or other language at home (only at S6).

Table 3-10 Prevalence of use of no contraception according to health risk behaviours among women born 1989-95 at baseline and most recent surveys

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Alcohol consumption		
Low risk drinker	6.6	15.5
Non-drinker	18.5	44.5
Rarely drinks	11.1	25.0
Risky drinker	13.8	19.8
Smoking		
Never smoked	7.0	18.7
Ex-smoker	10.2	29.1
Current smoker	15.8	27.1
Physical activity		
Inactive	13.7	27.7
Low	10.4	26.3
Moderate	7.3	22.5
High	8.1	15.7
BMI category (kg/m²)		
Underweight (<18.50)	6.9	26.3

	Survey 1 (2012/13) Aged 18-23 %	Survey 6 (2019/20) Aged 24-30 %
Healthy (18.59 - 24.99)	8.2	18.7
Overweight (25.09 - 29.99)	9.1	21.7
Obese (30.00 or more)	12.7	23.6
Use of marijuana^a		
Every day	-	32.0
Once a week or more	-	25.4
About once a month	-	23.6
Every few months	-	17.7
Once or twice a year	-	16.2
Never	-	21.6

^a Use of marijuana only asked at Survey 6

Overall, use of no contraception was highest at Survey 1 and Survey 6 among women born 1989-95 who did not drink alcohol, currently or no longer smoked, used illicit drugs, had more frequent use of marijuana, were less physically active and had a BMI in the obese category (only at Survey 1).

3.3.6 Use of other contraception

[Chapter 2](#) showed the use of other contraceptives remained steady at between 3 to 5% between Surveys 1 to 6. Descriptive information about how use of other contraception may have differed by demographic characteristics or health risk behaviours can be found in [Appendix 11.3](#).

3.4 Use of contraception by women in the 1973-78 cohort by socioeconomic and health behaviour characteristics

3.4.1 Use of the OCP

[Chapter 2](#) showed the overall prevalence of OCP use was approximately 47% when women were aged 18 to 23, then peaked at 55% three years later, and then gradually declined to 20% by the time the women were 40 to 45 years.

This next section describes how use of the OCP between Survey 1 and Survey 8 (when the women were aged 40 to 45) differed by socioeconomic characteristics and

health risk behaviours. The following tables show the associations between OCP use at the baseline and most recent surveys by these factors (Table 3-11 and Table 3-12). Detailed descriptions of these associations at the baseline and most recent surveys, as well as descriptions of notable trends between the surveys are also included.

Table 3-11 Prevalence of OCP use according to socioeconomic factors among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Area of residence		
Major city	43.3	18.9
Inner regional	47.1	20.9
Outer regional	56.3	19.8
Remote/very remote	58.3	20.4
Highest qualification		
Less than year 12	49.9	23.9
Year 12	45.0	23.4
Certificate/diploma/trade	52.0	19.7
University degree	46.3	18.6
Marital status		
Married	63.1	19.1
Defacto	74.7	19.1
Separated/divorced/widowed	50.0	22.9
Never married	41.6	19.0
Manage on income		
It is easy	43.0	20.7
It is not too bad	47.3	18.4
It is difficult some of the time	49.7	20.7
It is difficult all of the time	44.5	20.3
It is impossible	38.3	11.8
Labour force participation^a		
Part-time	47.0	18.9
Full-time	57.8	20.7
Unemployed/not in labour force	36.1	15.4

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Country of birth		
Australia	47.4	19.9
Other English-speaking country	46.9	12.2
Europe	38.5	17.9
Asia	18.3	11.1
Other	35.0	25.0
Language spoken at home		
English, born in Australia	48.6	20.3
English, born outside Australia	45.2	12.6
European language	26.8	14.3
Asian language	8.5	18.2
Other language	12.5	12.5

^a Asked at Survey 3

Socioeconomic factors

At Survey 1, OCP use was highest in women living in outer regional and remote areas (about 57%) compared with 47% and 43% in women living in inner regional and major cities, respectively. For women living in outer regional and remote areas, use remained as high at the next survey when women were aged 22 to 27 years, then dropped to around 20% by Survey 8. For women living in inner regional and major cities use increased between Survey 1 and 2 by around 10%, before gradually declining to about 20% at Survey 8.

At Survey 1, OCP use was between 45% and 52% in women regardless of how much education they had attained. At Survey 2, use of the OCP had increased by about 10% in women with a year 12 or university level education (each to 55%). By Survey 8 when the women were aged 40 to 45, use was between 19% and 24% in all women.

Regarding marital status, OCP use at Survey 1 was highest in women who were in a defacto relationship (75%) or married (63%) compared with women who were separated (47%) or had never married (42%). Due to low numbers, data on women who were divorced could only be used from Survey 4 onwards, when they were 28 to

33 years (OCP was used by 46%). At Survey 8, use of the OCP was 27% in women who were divorced and about 20% in women who had never married, were in a de facto relationship, separated or were married. ¹

Use of the OCP at Survey 1 was highest in women who found it not too bad or difficult some of the time to manage on their income (about 48%), around 44% in women who found it easy or difficult all of the time, and 38% in women who found it impossible. For women who found it easy to manage on their income this percent rose to 58% at Survey 3 when they were 50 to 55 years, and rose to 54% in women who found it not too bad. By Survey 8, OCP use was around 20% in women who found it easy, not too bad, difficult some of the time or difficult all of the time, and 12% in women who found it impossible to manage on their income.

Use of the OCP at Survey 2 was 60% in women who worked full-time and 50% in women who worked part-time. Data for those who were not in the labour force was first available from Survey 3 (36% used the OCP). By Survey 8 use of the OCP was similar for the women regardless of whether or how much they participated in the labour force, at around 17%.

Use of the OCP at Survey 1 was around 47% in women who were born in Australia or another English speaking country, about 38% in women born in Europe, and was lowest, at 18% for women born in Asia. Use for all women peaked at Survey 2 or 3: at around 55% for women born in Australia, another English speaking country or Europe and 33% for Asian born women. At Survey 8, use was around 19% for women born in Australia or Europe and about 12% for women born in Asia or another ESB country. ²

Women who spoke English at home had higher rates of using the OCP at Survey 1 (46%), compared to women who spoke a European language (27%). For English speaking women, use peaked at Survey 2 or 3 (at around 55%), while use peaked at 45% for women who spoke a European language. At Survey 8, use was highest in women who spoke English (and were born in Australia) (20%) compared with women

¹ *There were too few women who were widowed to make meaningful interpretations.*

² *There were too few women born in another non-ESB country to make meaningful conclusions.*

who spoke English but were not born in Australia or who spoke a European language (14%).³

Table 3-12 Prevalence of OCP use according to health risk behaviours among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Alcohol consumption		
Low risk drinker	50.7	19.4
Non-drinker	25.0	18.1
Rarely drinks	45.1	20.0
Risky drinker	42.5	20.9
Smoking		
Never smoked	42.3	20.0
Ex-smoker	54.6	17.5
Current smoker	52.0	21.2
Physical activity^a		
Inactive	53.2	16.6
Low	52.5	20.5
Moderate	59.1	23.1
High	55.6	17.6
BMI category (kg/m²)		
Underweight (<18.50)	45.0	20.6
Healthy (18.59 - 24.99)	48.7	19.0
Overweight (25.09 - 29.99)	43.4	19.9
Obese (30.00 or more)	36.4	20.1
Use of illicit drugs^a		
Never	51.4	22.5
Only ever used Marijuana - not in last 12 mths	62.4	18.4
Only ever used Marijuana – used in last 12mths	60.4	18.2

³ There were too few women who spoke an Asian or other non-ESB language to make meaningful interpretations.

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Used multiple/single drug other than Marijuana – not last 12 mths	56.1	16.4
Used multiple/single drug other than Marijuana ≥ once last 12 mths	51.9	13.1

^a Asked at Survey 2

Health risk behaviours

At Survey 1, OCP use was highest in women who were low risk drinkers (50%) followed by those who drank alcohol rarely or at risky levels (about 43%). Use was much lower in women who were non-drinkers (at 25%). By Survey 2, use of the OCP was higher by in all groups by around 9%, except for the women who drank at risky levels where the prevalence was around 20% higher. By Survey 8, use was around 20% for women regardless of their alcohol consumption.⁴

OCP use at Survey 1 was higher in women who were smokers and ex-smokers (around 53%) and about 10% less for women who were non-smokers. In women who were non-smokers, use of the OCP was higher at Survey 2 (at 56%) and had declined to 20% at Survey 8. For women who were smokers and ex-smokers, use gradually declined to about 19% at Survey 8.

A comparable physical activity question was first asked at Survey 2 when the women were aged 22 to 27. At this survey, use of the OCP was highest in women who participated in high and moderate levels of physical activity (around 57%) and was about 6% lower in women who participated in low levels of physical activity or who were inactive. By survey 8, use of the OCP was between 17% and 23% in women regardless of how much physical activity they did.

OCP use at Survey 1 was higher in women who were of a healthy weight (49%), followed by underweight or overweight (44%). Women who were in the obese BMI

⁴ There were too few women who were high risk drinkers to make meaningful interpretations about their use of the OCP.

category used the OCP the least (36%). Women in all BMI groupings showed higher OCP use at Survey 2 or 3 (increase of around 9%). By Survey 8, use was about 20% in women regardless of their weight.

Unlike in the 1989-95 cohort surveys, a single question about drug use for non-medicinal purposes was used in the 1973-78 cohort, starting from Survey 2 (when the women were aged 22 to 27). The question asked the women to separately indicate if they had used marijuana and any other illicit drugs, using the response options of 'never', 'in the last 12 months' or 'more than 12 months ago'. Use of OCP at Survey 1 was highest in women who had used marijuana recently or more than 12 months ago (about 60%) compared with around 54% in women who either never used illicit drugs or had ever used other illicit drugs. At Survey 8, use of the OCP was 22% in women who had never used illicit drugs, and between 13% and around 17% in women who had used ever marijuana or an illicit drug.

3.4.2 Use of condoms

[Chapter 2](#) showed overall prevalence of condom use was about 19% when women were aged 18 to 23, then peaked at 33% 10 years later, and then gradually declined to 23% by the time the women were 40 to 45 years.

The following tables show how use of condoms between Survey 1 and Survey 8 (when the women were aged 40 to 45) differed by demographic characteristics and health risk behaviours (Table 3-13 and Table 3-14). Detailed descriptions of these associations at the baseline and most recent surveys, as well as descriptions of noteworthy trends between the surveys are also included.

Table 3-13 Prevalence of condom use according to socioeconomic factors among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Area of residence		
Major city	20.7	25.2
Inner regional	19.1	18.9
Outer regional	14.9	20.5
Remote/very remote	20.7	25.2
Highest qualification		
Less than year 12	17.0	23.9
Year 12	18.8	17.1
Certificate/diploma/trade	20.9	22.2
University degree	21.4	24.5
Marital status		
Married	16.6	24.6
De facto	12.3	17.6
Separated/divorced/widowed	0.0	19.9
Never married	20.7	25.5
Manage on income		
It is easy	18.8	25.4
It is not too bad	18.5	23.3
It is difficult some of the time	19.4	23.0
It is difficult all of the time	23.0	19.9
It is impossible	18.1	21.6
Labour force participation^a		
Part-time	30.2	26.5
Full-time	33.3	20.5
Unemployed/not in labour force	30.2	26.7
Country of birth		
Australia	19.4	23.3
Other English-speaking country	21.4	22.2
Europe	17.9	32.1
Asia	11.7	17.8

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Other	30.0	41.7
Language spoken at home		
English, born in Australia	19.3	22.8
English, born outside Australia	20.8	23.6
European language	20.2	32.8
Asian language	17.0	24.2
Other language	16.7	18.8

^a Asked at Survey 3

Socioeconomic factors

At Survey 1, condom use was around 15% to 20% for women regardless of where they lived. Use increased by Survey 4, when the women were aged 28 to 33 years to around 30%. By Survey 8, use was slightly higher in women living in major cities or remote areas (26%) compared to women living in all other areas (around 20%).

At Survey 1, condom use was between 17% and 21% in women regardless of how much education they had attained. At Survey 4, use of the condom had increased by about 10% in all women, and by Survey 8 when the women were aged 40 to 45, use was around 17% in women with a year 12 level of education and only slightly higher in women with all other levels of education (22%).

Regarding marital status, condom use at Survey 1 was around 18% in married women and those who had never married, and was lower, at 12%, in women who were in a de facto relationship. Due to low numbers, data on women who were divorced and separated could only be used from Survey 4 onwards, when they were 28 to 33 years (about 40% of women in each group used condoms). At Survey 8, use of condoms was about 17% in women who were divorced, were in a de facto relationship or were

separated. Use in women who were never married or were married at Survey 8 was 25%.⁵

Use of condoms ranged between 18% and 23% in women at Survey 1, was around 32% at Survey 3 and 4, and 22% at Survey 8 regardless of how well the women reported managing on their income.

Use of condoms at Survey 2 or 3 was around 28% in women regardless of whether or how much they participated in the labour force. By Survey 8 use of condoms ranged from 20% to 26% for all women.

Use of condoms at Survey 1 was around 20% in women who were born in Australia, another English speaking country or Europe, and 12% in women born in Asia. Regardless of where women were born use peaked between Surveys 3 and 5. Women who spoke a European language had the highest peak in condom use at around 40%, compared with about 33% in women born in other countries. At Survey 8 condoms were used by 20% of women born in Australia, another English-speaking country or Asia, and 32% in women born in Europe.⁶

There was no difference in use of condoms in women at Survey 1 by the language they spoke at home (around 19%). Between Survey 3 and 5, use peaked at about 40% in women who spoke English (but were not born in Australia), a European or Asian language at home, compared to 31% in those who spoke English (and were born in Australia). At Survey 8, condom use was higher in women who spoke a European (33%) language at home, compared with women who spoke English or an Asian language (23%).⁷

⁵ *There were too few women who were widowed to make meaningful interpretations.*

⁶ *There were too few women born in another non-ESB country and who used condoms to make meaningful interpretations.*

⁷ *There were too few women who spoke another non-ESB language to make meaningful interpretations.*

Table 3-14 Prevalence of condom use according to health risk behaviours among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Alcohol consumption		
Low risk drinker	21.2	24.2
Non-drinker	11.5	18.5
Rarely drinks	15.8	24.4
Risky drinker	33.5	17.1
Smoking		
Never smoked	17.7	23.1
Ex-smoker	19.1	25.1
Current smoker	23.4	19.3
Physical activity^a		
Inactive	21.7	21.0
Low	24.9	21.0
Moderate	27.9	25.2
High	29.5	25.9
BMI category (kg/m²)		
Underweight (<18.50)	19.3	26.5
Healthy (18.59 - 24.99)	19.3	24.8
Overweight (25.09 - 29.99)	20.0	23.8
Obese (30.00 or more)	18.4	20.1
Use of illicit drugs^a		
Never	26.3	22.1
Only ever used Marijuana - not in last 12 mths	26.3	24.9
Only ever used Marijuana – used in last 12mths	27.0	25.0
Used multiple/single drug other than Marijuana – not last 12 mths	27.5	23.2
Used multiple/single drug other than Marijuana ≥ once last 12 mths	30.7	24.8

^a Asked at Survey 2

Health risk behaviours

At Survey 1, condom use was highest in women who were risky drinkers (35%) followed by those who drank alcohol at a low risk level or rarely (about 18%) or were non-drinkers (11%). By Surveys 3 and 4, use of condoms remained highest in women who were risky drinkers (38%), and was around 32% in women in the other alcohol consumption categories. By Survey 8, condom use was about 22% in women regardless of how much or whether they drank.⁸

Condoms were used at Survey 1 by around 20% of women regardless of whether they currently or had ever smoked. Use peaked at Surveys 3 to 5 (to around 33%) and then fell to around 21% at Survey 8 in all women.

At Survey 2, use of condoms was highest in women who participated in high and moderate levels of physical activity (around 29%) and was around 23% in women who participated in low levels or were inactive. Use remained highest in women with the most physical activity (high or moderate levels) across the Surveys, peaking at around 33% at Surveys 3 or 4. By Survey 8, use remained highest in the most active women (26%) compared to those who were less active or inactive (around 21%).

Condom use at Survey 1 was about 19% in women regardless of their BMI. Use of condoms rose to around 32% in women of all body weights over the next few Surveys before declining to between 20% and 26% by Survey 8.

Unlike in the 1989-95 cohort Surveys, a single question about drug use for non-medicinal purposes was used in the 1973-78 cohort, starting from Survey 2 (when the women were aged 22 to 27). The question asked the women to separately indicate if they had used marijuana and any other illicit drugs, using the response options of never, in the last 12 or more than 12 months ago. Use of condoms at Survey 2 (by around 28% of women), Survey 4 (around 33%) and Survey 8 (around 24%) was equivalent in women regardless of their drug use.

⁸ *There were too few women who were high risk drinkers to make meaningful interpretations about their use of condoms*

3.4.3 Use of long acting LARC methods

[Chapter 2](#) showed the overall prevalence of LARC use was about 11% when first asked in Survey 5, when women were aged 31 to 36. This gradually increased to 24% by the time the women were 40 to 45 years, at Survey 8. For the purposes of data collected from the 1973-78 cohort, LARCs include the injection, hormonal and copper IUDs, vaginal rings and implants.

The following tables show how use of LARCs between Survey 5 and Survey 8 differed by demographic characteristics and health risk behaviours (Table 3-15 and Table 3-16).

Table 3-15 Prevalence of use of LARCs according to socioeconomic factors among women born 1973-78 at their baseline and most recent surveys

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Area of residence		
Major city	8.7	23.0
Inner regional	13.8	24.9
Outer regional	13.9	28.9
Remote/very remote	12.2	30.6
Highest qualification		
Less than year 12	13.9	16.5
Year 12	14.8	23.4
Certificate/diploma/trade	9.7	23.3
University degree	10.0	25.4
Marital status		
Married	12.0	27.5
Defacto	9.0	19.7
Separated/divorced/widowed	12.0	23.3
Never married	7.6	16.4
Manage on income		
It is easy	8.0	25.0
It is not too bad	10.7	24.8

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
It is difficult some of the time	11.8	23.2
It is difficult all of the time	13.5	22.2
It is impossible	12.0	31.4
Labour force participation		
Part-time	13.4	25.9
Full-time	9.0	24.7
Unemployed/not in labour force	9.6	17.0
Country of birth		
Australia	10.7	24.9
Other English-speaking country	11.1	26.7
Europe	3.2	10.7
Asia	10.6	8.9
Other	15.4	16.7
Language spoken at home		
English, born in Australia	11.0	24.9
English, born outside Australia	11.7	23.6
European language	5.9	21.8
Asian language	5.4	9.1
Other language	0.0	18.8

Table 3-15 shows that there were few consistent differences in use of LARCs by socioeconomic factors. Possible differences were that use of LARC methods was higher at Survey 8 among women born 1973-78 who were married or separated/widowed/divorced and lived in more remote areas and lower in women who spoke an Asian language at home. See [Appendix 11.3.2](#) for more description.

Table 3-16 Prevalence of use of LARCs according to health risk behaviours among women born 1973-78 at their baseline and most recent surveys

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Alcohol consumption		
Low risk drinker	10.7	26.1
Non-drinker	8.4	17.7
Rarely drinks	11.0	22.1
Risky drinker	12.3	27.2
Smoking		
Never smoked	10.5	24.8
Ex-smoker	10.7	24.0
Current smoker	11.0	23.1
Physical activity		
Inactive	11.6	25.1
Low	12.2	22.2
Moderate	8.7	24.9
High	9.8	25.8
BMI category (kg/m²)		
Underweight (<18.50)	9.6	11.8
Healthy (18.59 - 24.99)	8.8	23.5
Overweight (25.09 - 29.99)	12.1	23.0
Obese (30.00 or more)	13.3	28.0
Use of illicit drugs		
Never	11.1	23.8
Only ever used Marijuana (not in last 12 mths)	11.4	27.6
Only ever used Marijuana (used in last 12mths)	14.5	31.8
Used multiple/single drug other than Marijuana (not last 12 mths)	8.6	20.2
Used multiple/single drug other than Marijuana (≥ once last 12 mths)	8.6	27.7

Table 3-16 shows that there were few consistent differences in use of LARCs by health risk behaviours with the exception of lower use of LARCs at Survey 8 in women who were underweight. More descriptions can be found in [Appendix 11.3.2](#).

3.4.4 Use of the withdrawal method

[Chapter 2](#) showed the overall prevalence of the withdrawal method was steady at around 11% between Surveys 5 and 8. The following tables show how use of the withdrawal method between Survey 5 and Survey 8 differed by demographic characteristics and health risk behaviours (Table 3-17 and Table 3-18).

Table 3-17 Prevalence of use of the withdrawal method of contraception according to socioeconomic factors among women born 1973-78 at their baseline and most recent surveys

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Area of residence		
Major city	11.1	12.1
Inner regional	8.8	8.4
Outer regional	9.9	9.4
Remote/very remote	9.4	12.2
Highest qualification		
Less than year 12	7.4	9.2
Year 12	13.3	11.7
Certificate/diploma/trade	11.5	12.0
University degree	9.7	10.4
Marital status		
Married	11.4	11.5
Defacto	13.4	15.0
Separated/divorced/widowed	13.2	8.2
Never married	6.4	6.2
Manage on income		
It is easy	9.3	7.9
It is not too bad	10.9	12.0
It is difficult some of the time	10.6	11.1
It is difficult all of the time	11.7	11.7
It is impossible	10.7	11.8
Labour force participation		
Part-time	10.7	12.7

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Full-time	9.6	9.3
Unemployed/not in labour force	13.4	13.0
Country of birth		
Australia	10.3	10.7
Other English-speaking country	12.3	11.1
Europe	16.7	10.7
Asia	15.8	20.0
Other	0.0	0.0
Language spoken at home		
English, born in Australia	10.0	10.2
English, born outside Australia	10.7	11.8
European language	16.6	18.5
Asian language	18.2	15.2
Other language	13.6	6.3

In summary, use of the withdrawal method was highest at Survey 8 among women born 1973-78 who were in a de facto relationship and spoke a European language at home. See [Appendix 11.3.2](#) for more description.

Table 3-18 Prevalence of use of the withdrawal method of contraception according to health risk behaviours among women born 1973-78 at their baseline and most recent surveys

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Alcohol consumption		
Low risk drinker	10.6	10.9
Non-drinker	9.1	11.5
Rarely drinks	10.7	10.9
Risky drinker	11.1	9.5
Smoking		
Never smoked	9.1	10.3
Ex-smoker	13.9	11.9

	Survey 5 (1996) Aged 31-36 %	Survey 8 (2018) Aged 40-45 %
Current smoker	12.0	12.7
Physical activity		
Inactive	10.5	9.5
Low	11.1	11.1
Moderate	9.2	9.1
High	11.1	12.4
BMI category (kg/m²)		
Underweight (<18.50)	19.7	23.5
Healthy (18.59 - 24.99)	12.0	12.7
Overweight (25.09 - 29.99)	7.6	10.7
Obese (30.00 or more)	7.1	7.8
Use of illicit drugs		
Never	7.3	8.3
Only ever used Marijuana (not in last 12 mths)	10.0	11.5
Only ever used Marijuana (used in last 12mths)	12.0	13.6
Used multiple/single drug other than Marijuana (not last 12 mths)	15.4	14.0
Used multiple/single drug other than Marijuana (≥ once last 12 mths)	15.2	16.8

There were few consistent differences in use of the withdrawal method by health risk behaviours apart from a trend for higher use by women who were underweight or who used illicit drugs. See [Appendix 11.3.2](#) for more description.

3.4.5 Use of the fertility awareness period method or emergency OCP

[Chapter 2](#) showed the overall prevalence of the fertility awareness period method (around 5%) or use of the emergency OCP (1%) between Surveys 5 and 8. Descriptive information about emergency OCP use can be found in [Appendix 11.3.3](#).

3.4.6 Use of no contraception

Chapter 2 showed the overall prevalence of use of no contraception was 30% when women were aged 18 to 23, and dropped slightly over the next few surveys before rising to 27% by the time the women were 40 to 45 years. The following tables show the associations between use of no contraception at the baseline and most recent surveys by these factors (Table 3-19 and Table 3-20). Detailed descriptions of these associations at the baseline and most recent surveys, as well as descriptions of interesting trends between the surveys are also included.

Table 3-19 Prevalence of use of no contraception according to socioeconomic factors among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Area of residence		
Major city	32.8	26.9
Inner regional	29.9	30.3
Outer regional	26.5	25.6
Remote/very remote	19.2	12.2
Highest qualification		
Less than year 12	26.9	31.2
Year 12	33.3	28.3
Certificate/diploma/trade	24.9	28.1
University degree	28.6	26.4
Marital status		
Married	14.1	21.5
Defacto	6.5	32.4
Separated/divorced/widowed	40.0	34.6
Never married	35.2	39.9
Manage on income		
It is easy	35.9	24.8
It is not too bad	31.1	26.7
It is difficult some of the time	27.8	27.9
It is difficult all of the time	27.7	31.6

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
It is impossible	37.2	29.4
Labour force participation^a		
Part-time	26.6	23.8
Full-time	20.7	28.6
Unemployed/not in labour force	31.6	31.2
Country of birth		
Australia	30.0	26.5
Other English-speaking country	25.5	31.1
Europe	41.0	28.6
Asia	68.3	42.2
Other	30.0	33.3
Language spoken at home		
English, born in Australia	29.0	26.7
English, born outside Australia	28.4	31.5
European language	50.0	24.4
Asian language	72.3	36.4
Other language	66.7	43.8

^a Asked at Survey 3

Socioeconomic factors

At Survey 1, use of no contraception was highest in women living in major cities and inner regional areas (about 31%), 26% in those living in outer regional areas and 19% in those in remote areas. Over the next few surveys use by women living in major cities and regional areas then dropped to percentages in the low twenties before rising to about 28% at Survey 8. For women living in remote areas, use rose by about 8% between Survey 3 and Survey 4, before dropping to 12% by Survey 8.

Use of no contraception was around 30% at Survey 1, and about 28% at Survey 8 in women regardless of their level of attained education.

Associations between use of no contraception and marital status were mixed. At Survey 1, no use of contraception was highest, at 35%, in never married women, and much lower, 14% and 7% in women who were married or in a de facto relationship,

respectively. For never married women, percentage use of no contraception dropped to be in the low twenties throughout Surveys 2 to 5 before rising to 40% at Survey 8. Women who were married showed their highest use of no contraception at Survey 3 (27%) before this dropped to 22% by Survey 8. In women in a de facto relationship, use of contraception was less than 20% until Survey 5, when it rose to 32% by Survey 8. Due to low numbers, data on women who were separated or divorced could only be used from Survey 3 and Survey 5 onwards, respectively. For women who were separated, use ranged from 32% at Survey 3, 18% at Survey 4 and then 33% by Survey 8. For divorced women, use of no contraception was 26% at Survey 5 and then rose to 34% by Survey 8.⁹

Use of no contraception at Survey 1 was 36% in women who found it easy to manage on their income, and around 29% in women who found 'not too bad', 'difficult some of the time' or 'difficult all of the time'. At Survey 8, use of no contraception was between 25% and 32% in women regardless of how well they managed on their income.¹⁰

Use of no contraception was about 18% (at Survey 2) in women who worked full-time or part-time and 32% in women who were not in the labour force (at Survey 3). By Survey 8 use of no contraception was around 30% for women who worked full-time or were not in the labour force and 24% for women who worked part-time.

Use of no contraception was around 28% at Survey 1 and 8 in women who were born in Australia or another English-speaking country.¹¹

Women who spoke a European language at home had a higher rate of using no contraception at Survey 1 (50%), compared to women who spoke English (28%). Use of no contraception then ranged between 17% and 26% over the subsequent few surveys for all women. By Survey 8, between 24% and 32% of women who spoke a

⁹ *There were too few women who were widowed to make meaningful interpretations.*

¹⁰ *Note: There were too few women who found it impossible to manage on their income to make meaningful interpretations.*

¹¹ *Note: There were too few women who were born in Europe, Asia or another non-English speaking background country to make meaningful interpretations.*

European language or English (regardless of where they were born) did not use contraception.

Table 3-20 Prevalence of use of no contraception according to health risk behaviours among women born 1973-78 at their baseline and most recent surveys

	Survey 1 (1996) Aged 18-23 %	Survey 8 (2018) Aged 40-45 %
Alcohol consumption		
Low risk drinker	25.4	24.8
Non-drinker	61.1	36.2
Rarely drinks	35.1	28.8
Risky drinker	18.0	27.8
Smoking		
Never smoked	37.7	27.0
Ex-smoker	21.3	27.0
Current smoker	19.9	27.4
Physical activity^a		
Inactive	20.1	29.8
Low	20.1	30.3
Moderate	15.6	23.9
High	17.6	24.5
BMI category (kg/m²)		
Underweight (<18.50)	32.2	23.5
Healthy (18.59 - 24.99)	28.8	24.7
Overweight (25.09 - 29.99)	32.1	27.8
Obese (30.00 or more)	43.8	29.5
Use of illicit drugs^a		
Never	23.6	28.0
Only ever used Marijuana (not in last 12 mths)	12.9	23.6
Only ever used Marijuana (used in last 12mths)	13.7	20.5
Used multiple/single drug other than Marijuana (not last 12 mths)	14.5	30.2
Used multiple/single drug other than Marijuana (≥ once last 12 mths)	14.6	25.5

^a Asked at Survey 2

Health risk behaviours

At Survey 1, use of no contraception was highest in women who were non-drinkers (61%) followed by those who drank alcohol rarely (35%), at low risk levels (25%) or risky levels (17%). By Survey 8, use was around 25% for women who drank alcohol at low risk or risky levels and 30% for those who drank rarely. Use of no contraception was highest at Survey 8 for those who did not drink (36%).¹²

Use of no contraception at Survey 1 was higher in women who were non-smokers (38%) compared with smokers and ex-smokers (around 20%). For all women, use of no contraception at Survey 8 was about 27%.

Use of no contraception was around 18% at Survey 2, and between 24% and 30% at Survey 8 in women regardless of how much physical activity the woman did.

Use of no contraception at Survey 1 was higher in women with a BMI in the obese category (44%), followed by those with a BMI in the underweight, healthy weight or overweight categories (about 30%). Use of no contraception was between 24% and 29% at Survey 8 by all women regardless of their BMI.

Use of no contraception at Survey 2 was highest in women who had never used any illicit drug (24%) and about 14% in women who had used marijuana or illicit drugs, regardless of when. At Survey 8, use of no contraception was between 24% and 30% in women regardless of their drug use.

3.5 Previously published ALSWH research

Several authors have examined contraceptive use by women in the ALSWH 1973-78 cohort. A brief summary of the key findings from studies over the past 10 years and their implications for policy is presented here.

Lucke and Herbert (2014) examined factors associated with the uptake of long-acting reversible (implant, IUD, injection); permanent (tubal sterilisation, vasectomy), and traditional (OCP, condoms, withdrawal, fertility awareness period) contraceptive

¹² *Note: There were too few women who were high risk drinkers to make meaningful interpretations about their use of no contraception.*

methods among 5,849 women in the 1973-78 cohort who responded to Surveys 3, 4 and 5.

Compared to women living in major cities, women in inner regional areas were more likely to use long-acting (OR =1.26, 95%CI 1.03-1.55) or permanent contraceptive methods (OR=1.43, 95%CI 1.17-1.76). Women living in outer regional or remote areas were more likely than women living in cities to use long-acting (OR=1.65, 95%CI 1.31-2.08) or permanent contraceptive methods (OR=1.69, 95%CI 1.43-2.14). Women with a baby were less likely to use LARC (OR=0.37, 95%CI 0.23-0.58) or permanent contraceptive methods (OR=0.16, 95%CI 0.09-0.29), and women with school aged children were more likely to be using LARC (OR=1.83, 95%CI 1.43-2.33) or permanent contraceptive methods (OR=4.39, 95%CI 3.54-5.46) compared with women with pre-school aged children. The likelihood of using LARC and permanent contraceptive methods increased with the number of children a woman reported having. Married women were more likely to use permanent contraceptive methods compared with those who were single or living with a partner. Use of LARC methods (but not permanent methods) was associated with a BMI category of overweight or obese. Women were more likely to use permanent contraceptive methods if they reported poorer access to a GP (OR=1.27, 95%CI 1.07-1.52) compared to those who reported excellent or good access to a GP. The finding of higher use of LARC and permanent contraceptive methods by women living outside major cities had not previously been reported in a non-clinical sample. The authors speculated that increased use may reflect that fertility levels are higher outside of major cities and that LARC methods may be the preference for women who do not have easy regular access to GPs or pharmacies.

3.6 Summary

This chapter has presented the prevalence of use of different types of contraception among women in Australia by socioeconomic and health behaviour characteristics. The analyses are simple unadjusted cross sectional associations. Longitudinal analyses focussed on LARC use are presented in [Chapter 5](#). There were mixed associations between socioeconomic factors and contraception use between cohorts. Of women in the 1989-95 cohort, higher socioeconomic status (reflected by higher

levels of education and less income stress) was associated with greater use of the OCP and condoms, and less use of the implant or no contraception, in contrast to the 1973-78 cohort, where these associations were not found. Women in the 1989-95 cohort living in remote or rural areas had a higher prevalence of implant use or no use of contraception. In comparison, women born in 1973-78 who lived in rural and remote settings had higher use of the OCP. In both cohorts, women who spoke a non-English language at home had higher use of condoms and no use of contraception. A general trend found in both cohorts with respect to health behaviour characteristics was that women who reported engaging in less healthy behaviours (e.g., illicit drug use, smoking, low physical activity) or had a BMI in the overweight or obese categories were more likely to not use contraception.

3.7 References

Lucke J & Herbert D. (2014). Higher uptake of LARC and permanent contraceptive methods by Australian women living in rural and remote areas. *Australian & New Zealand Journal of Public Health*, 38(2): 112-116.

4. THE USE OF CONTRACEPTIVES FOLLOWING REPRODUCTIVE EVENTS

Authors: Leigh Tooth, Richard Hockey

4.1 Key points

Use of contraception by women in the 1989-95 cohort following reproductive events

- Women who had no children or other reproductive events were more likely to primarily use the OCP and condoms during their twenties.
- Women with one child were more likely to use no contraception than the OCP or condoms when they were aged 19 to 30 years.
- Women with two children were generally equally likely to use the OCP, condoms, or no contraception when they were aged 19 to 30 years.
- Women who had experienced a miscarriage were generally equally likely to use the OCP, condoms, or no contraception between the ages of 18 and 25 years, but were more likely to use no contraception after that.
- Women who had experienced a termination when aged 18-23 years were more likely to report using LARCs when aged 19-24 years. They had generally higher use of the OCP at each survey until they were 25 years, and higher use of condoms across all the surveys. Around 30% of women reported using no contraception when they were 24 to 30 years.

Use of contraception by women in the 1973-78 cohort following reproductive events

- Women who had no children were more likely to primarily use the OCP and condoms until in their mid-thirties when they were then more likely to use no contraception.
- Women with one child were most likely to use the OCP until they were aged 28 to 33 years. After this time, rates of no contraception use increased.
- Women with two children were more likely to use the OCP and condoms until they were 34 to 39 years, after which time, their use of LARC increased. Women

in this category were most likely to use no contraception when they were 25 to 30 years.

- Women with three or more children were more likely to not use any contraception until they were 28 to 33 years. After this time, rates of OCP and condom remained the same and use of LARC increased.
- Women who had experienced a miscarriage were generally equally likely to use the OCP, condoms, or no contraception between the ages of 18 and 36 years, and were more likely to use no contraception after this time.
- Women's use of OCP following termination (compared with use following live birth or miscarriage) was higher in all surveys from age 18-23 to 28-33, use of LARC was higher from age 31-36 to 34-39, and use of fertility awareness methods was lower from age 31 onwards.

4.2 Introduction

This chapter describes use of contraception among women following a reproductive event. These reproductive events include having a live child, number of children born, having any reproductive event, having a miscarriage, and having a termination (see [Appendix 11.4.1](#) for details on the survey questions used). Women were asked at each survey whether they had experienced a reproductive event. To estimate a temporal association, the data showed in the graphs represents contraception used by women who reported that they had experienced the reproductive event between the previous survey and the current survey. For example, if a woman had experienced a miscarriage between Survey 1 and 2, that miscarriage (and its possible impact on the women's contraceptive choices) would be counted only for Survey 2. 'Ever having experienced a reproductive event' were not captured in the graphs. As the prevalence of emergency contraception use, only asked of the 1973-78 cohort, is very low (N = 169 total from Survey 3 to 8), detailed analyses of this method following reproductive events was not conducted and a descriptive summary is provided in [Appendix 11.4.2](#).

4.3 Use of contraception by reproductive events by women in the 1989-95 cohort

This section presents data on the use of the different contraceptive methods by reproductive events experienced by women in the 1989-95 cohort. The reproductive events considered include:

1. Number of children born;
2. Any reproductive event (including live births, stillbirths, miscarriages and terminations);
3. A live birth at the previous survey;
4. A miscarriage; and
5. A termination.

4.3.1 Number of children

The following graphs show the prevalence of use of contraceptive methods by the total number of children a woman had prior to a survey, from Survey 1 (when the women were aged 18 to 23) to Survey 6 (when aged 24 to 30). (Note that as women could choose more than one type of contraception at any survey, the percentages do not add up to 100.)

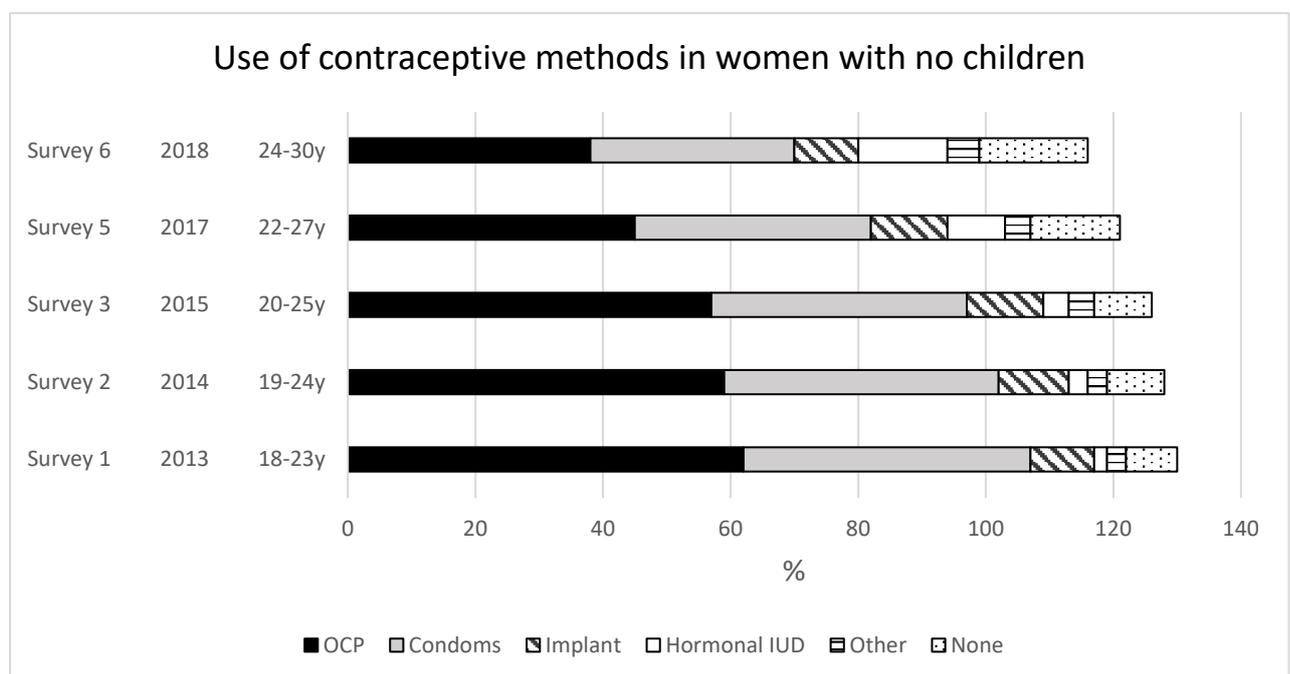


Figure 4-1 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort with no children.

Note: The figure shows contraceptive use according to whether women had not had children by that survey. Thus, if a woman had a child between Survey 1 and Survey 2 they will be in this graph for Survey 1 and the following graph for Survey 2 (and so on).

When women had no children, use of the OCP and condoms were the predominant methods of contraception over the five surveys (Figure 4-1). While use of the implant and other methods remained steady across the surveys, use of the hormonal IUD and no contraception increased as the women entered their mid- to late twenties.

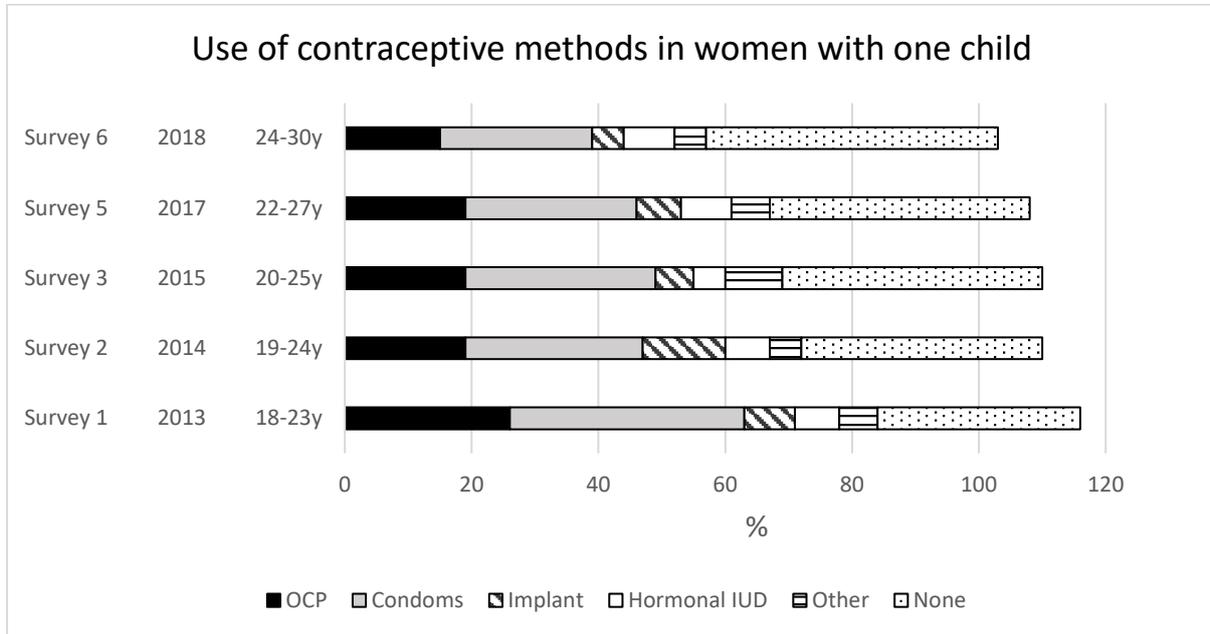


Figure 4-2 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had given birth to one child up to that survey.

Figure 4-2 shows that when women had one child, use of the OCP, condoms, or not using a contraceptive method were the predominant methods at all surveys. Use of no contraception continued to increase as the women aged, becoming the most prevalent method from Survey 2 onwards, while use of the OCP and condoms slowly declined over the five surveys. Use of LARC or other contraceptive methods showed little change in prevalence across the surveys.

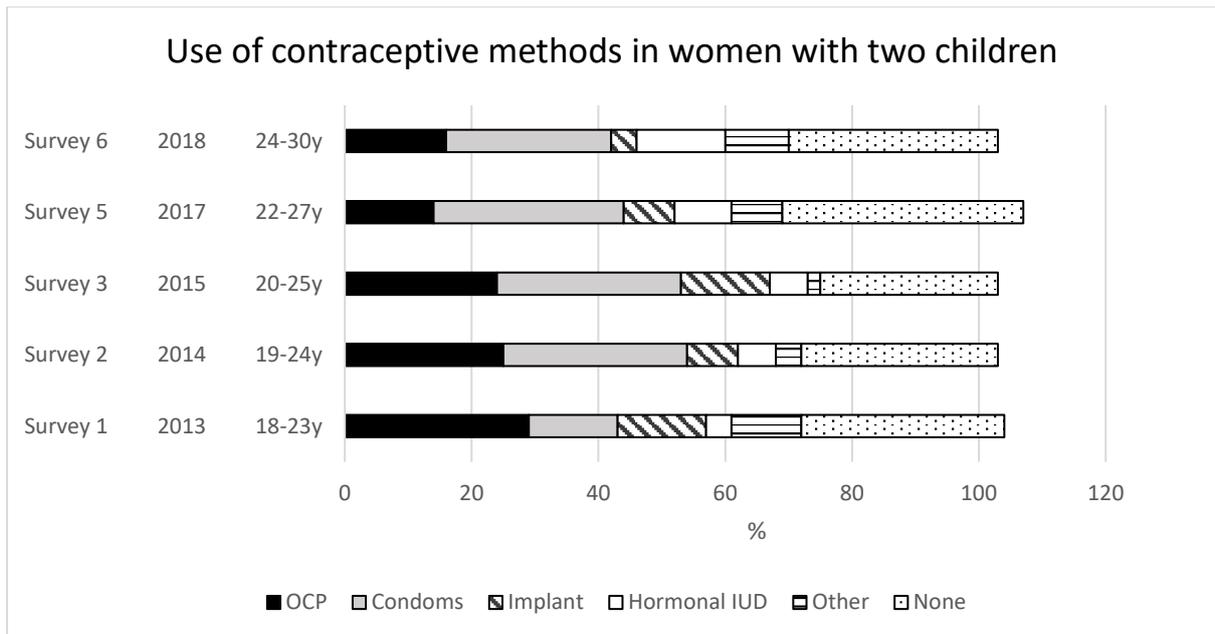


Figure 4-3 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had given birth to two children up to that survey.

Figure 4-3 shows that for women with two children, use of the OCP or no contraceptive method were the predominant methods indicated at Survey 1. Over time, use of condoms and no contraception generally increased while use of the OCP decreased. Use of the implant was greater than the hormonal IUD until around Survey 5, when the women were 22 to 27 years. By Survey 6, use of the hormonal IUD was more than double that of the implant.

The numbers of women who had three or more children were too low to enable a meaningful graph of contraceptive methods to be presented.

4.3.2 Use of contraception after reproductive events

The following graphs show the prevalence of contraceptive methods use at each survey by whether the women had any reproductive events in the previous survey. Firstly, any reproductive event (live birth, stillbirth, miscarriage, termination) is presented, followed by separate graphs for whether they had experienced a live birth, miscarriage, or termination. Stillbirths are not graphed due to the very low number of

women reporting this experience. For comparison purposes, the first graph (Figure 4-4) presents data for women who did not experience any of these reproductive events. The time frame represented in the graphs captures any reproductive event recorded at the previous survey, or prior to the first survey for Survey 1. Note that as women could choose more than one type of contraception at any survey, the percentages do not add up to 100.

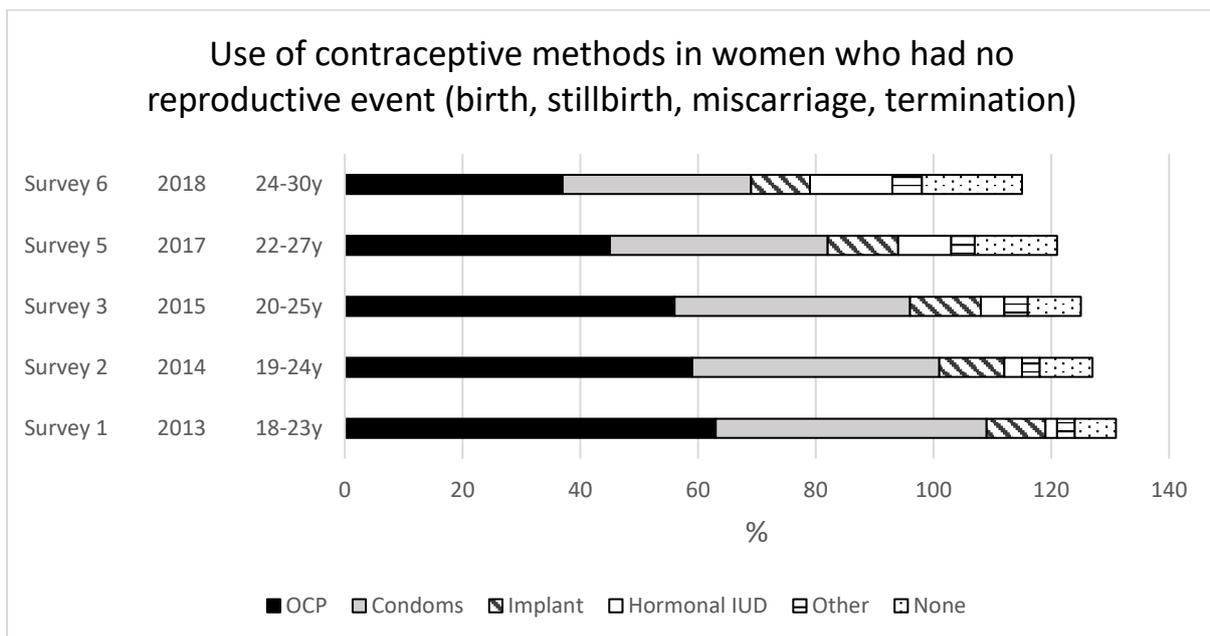


Figure 4-4 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had not experienced a birth, stillbirth, miscarriage, or termination reported at the previous survey.

Figure 4-4 shows that among women who had not experienced any reproductive event, use of the OCP and condoms were the predominant methods of contraception over the five surveys. While use of the implant and other methods remained steady across the surveys, use of the hormonal IUD and no contraception use increased as the women entered their mid- to late twenties. This pattern of contraception use was very similar to that shown by women who had no children (see Figure 4-1).

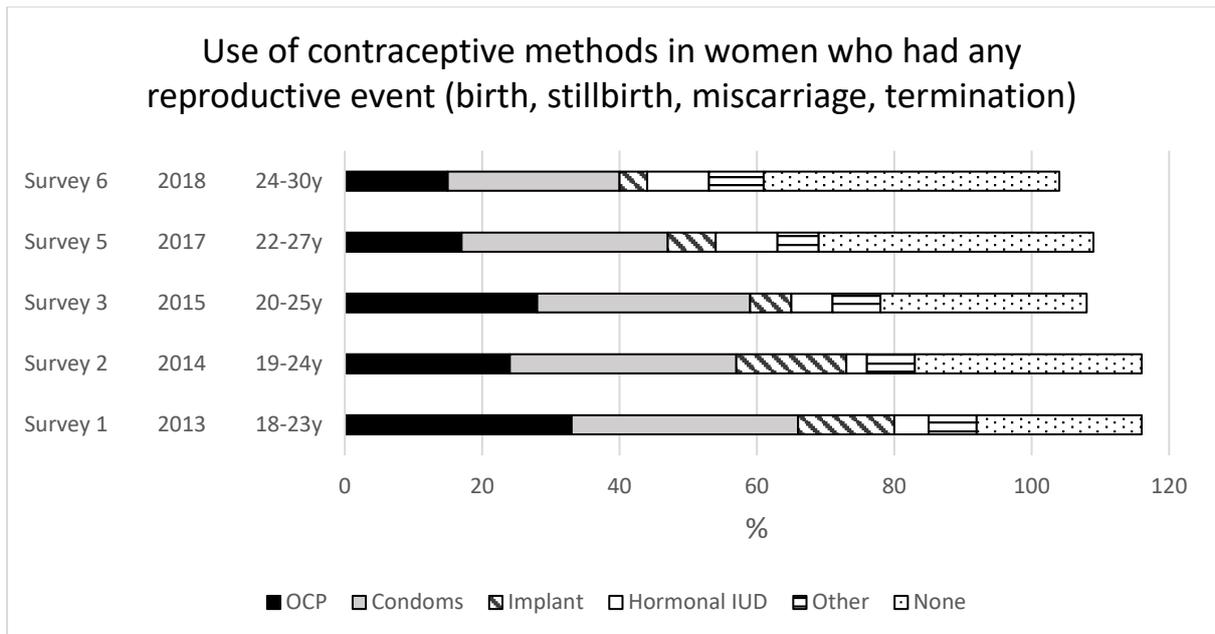


Figure 4-5 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had experienced a birth, stillbirth, miscarriage, or termination reported at the previous survey.

Figure 4-5 shows that when women had reported any reproductive event in the previous survey, use of the OCP, condoms, or no contraceptive method were the predominant methods of contraception at all surveys. Use of no contraception increased from Survey 5 onwards, when the women were aged 22 to 27 years. Use of implant was highest when the women were younger (between 18 and 24 years) and halved as women entered their mid- to late twenties.

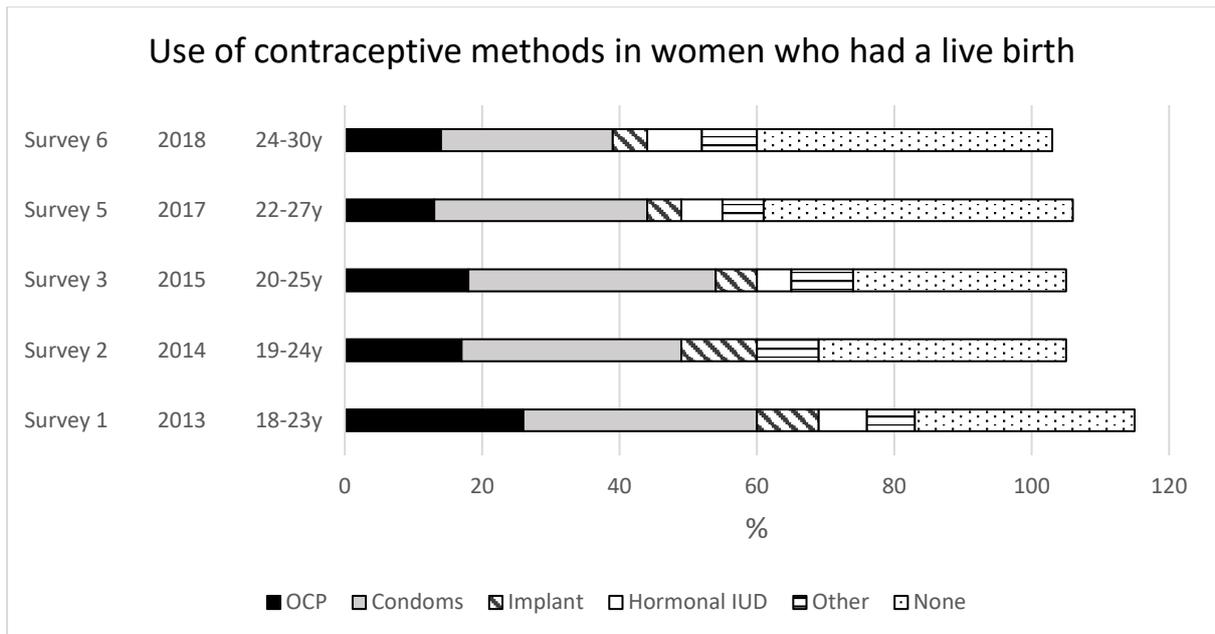


Figure 4-6 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a live birth reported at the previous survey.

Use of the OCP, condoms, or no contraceptive method were the predominant methods of contraception at Survey 1 among women who had reported a live birth (Figure 4-6). Over time, use of condoms and no contraception remained the most prevalent methods, while use of the OCP declined by almost a half. Use of LARC and other methods of contraception remained fairly steady across the surveys.

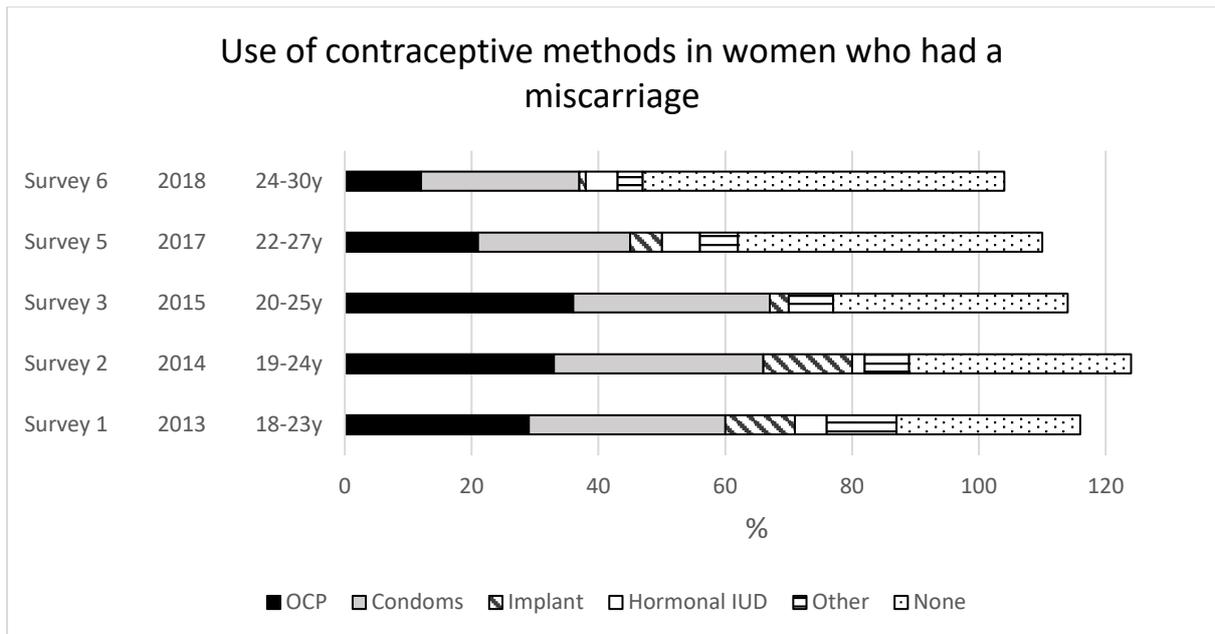


Figure 4-7 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a miscarriage reported at the previous survey.

Use of the OCP, condoms, or no contraceptive method were the predominant methods of contraception among women who had experienced a miscarriage, when aged 18 to 25 years (Figure 4-7). Over time, use of condoms and the OCP declined, while no contraception use increased to over 50% by the time women were 24 to 30 years. Use of the implant was highest when the women were younger (between 18 and 24 years) and more than halved as women entered their mid- to late twenties.

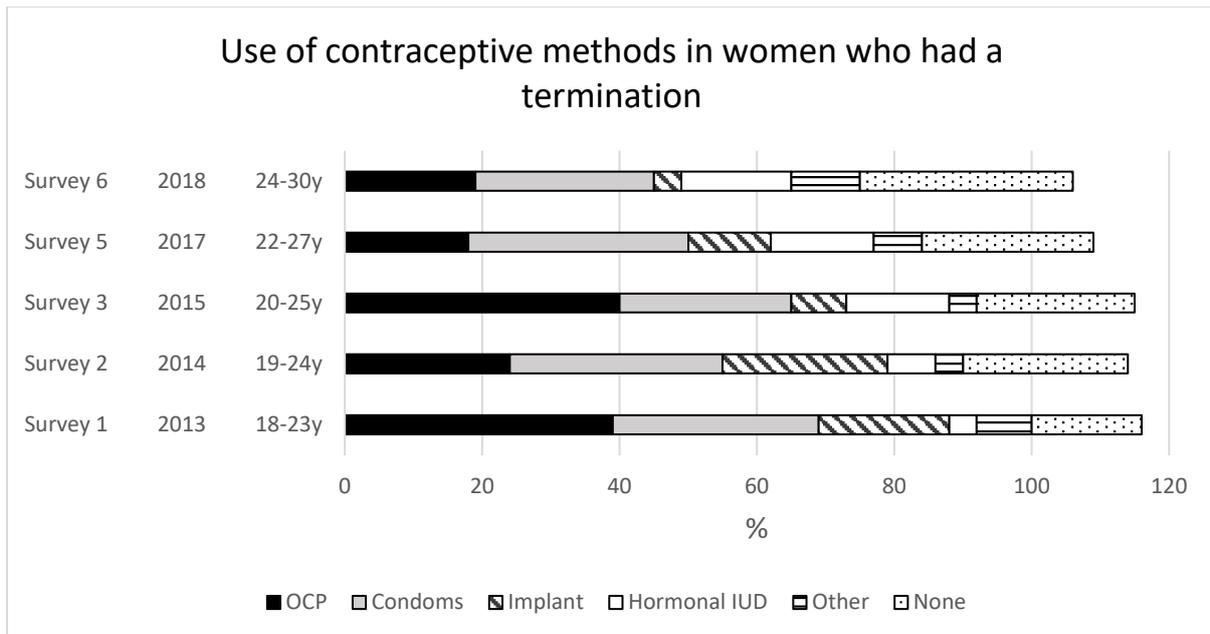


Figure 4-8 Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a termination reported at the previous survey.

Figure 4-8 shows that at Surveys 1 and 2, use of OCP, condoms, and implant were highest among women who had had a termination. Over time, use of condoms remained fairly consistent, while use of OCP peaked at Survey 3 but then dropped. Use of no contraception and the hormonal IUD slowly increased as the women aged.

4.4 Use of contraception by reproductive events by women in the 1973-78 cohort

This section presents data on use of the different contraceptive methods by reproductive events experienced by women in the 1973-78 cohort. The reproductive events were whether the women had:

1. Number of children born;
2. Any reproductive event (including live births, stillbirths, miscarriages, and terminations);
3. A live birth at the previous survey;
4. A miscarriage; and
5. A termination.

As above, women were asked at each survey whether they had experienced a reproductive event. To estimate a temporal association, the data showed in the graphs represents contraception used by women who reported that they had experienced the reproductive event between the previous survey and the current survey. For example, if a woman had experienced a miscarriage between Survey 1 and 2, that miscarriage (and its possible impact on the women’s contraceptive choices) would be counted only for Survey 2. ‘Ever having experienced a reproductive event’ were not captured in the graphs.

4.4.1 Number of children

The following graphs show the prevalence of contraceptive method use by the number of children a woman had given birth to prior to a survey, across Surveys 1 (when the women were aged 18 to 23) to 8 (when aged 40 to 45). Note that as women could chose more than one type of contraception at any survey, the percentages do not add up to 100.

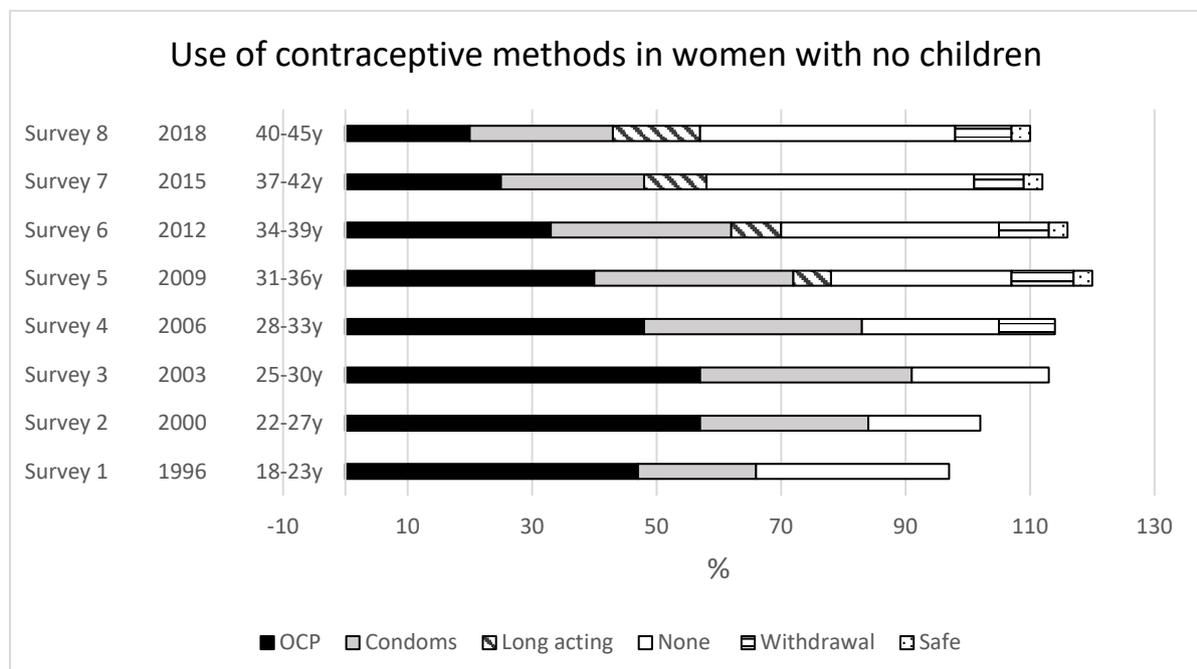


Figure 4-9 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort with no children.

Figure 4-9 shows that among women with no children, the OCP was the predominant method of contraception used, followed by condoms, until the women were in their late thirties and early forties. Use of LARC doubled over time, from when the women were 31 to 36 years to when they were 40 to 45 years. Use of no contraception steadily rose from Survey 2, becoming the most prevalent form of contraception from when the women were aged 34 to 39 years.

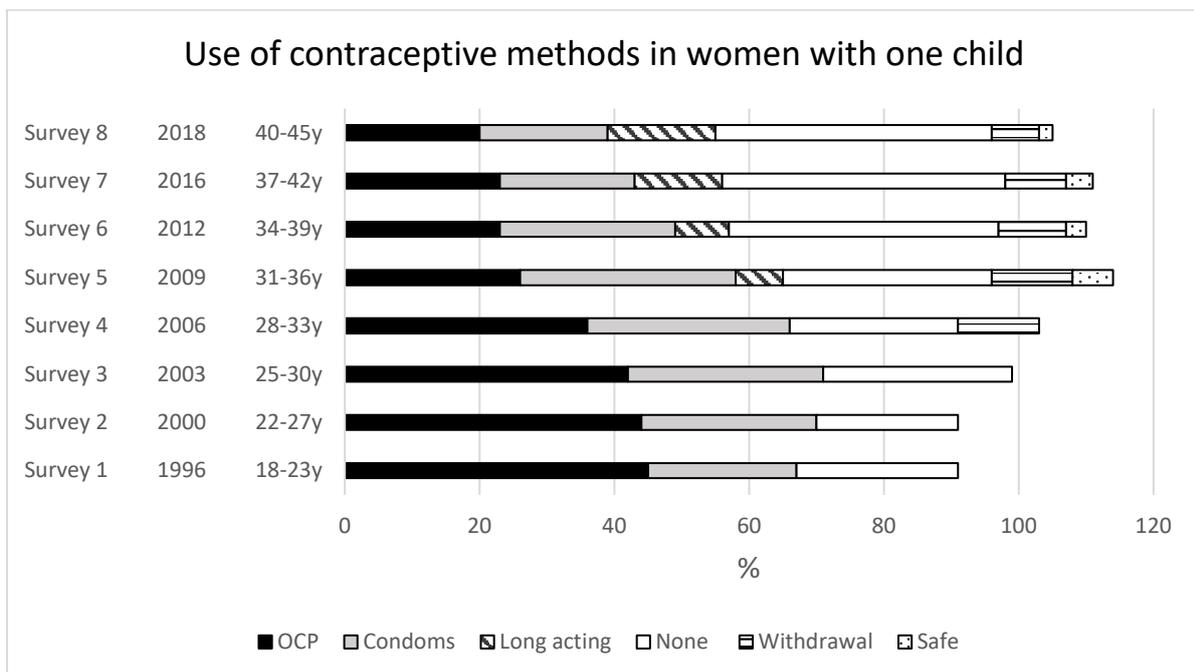


Figure 4-10 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had given birth to one child up to that survey.

Figure 4-10 shows that when women had one child, the OCP was the predominant method of contraception used, followed by condoms, until the women were in their early to mid-thirties. Use of LARC doubled over time, from when the women were 31 to 36 years to when they were 40 to 45 years. Use of no contraception steadily rose from Survey 4, becoming the most prevalent form of contraception, from when the women were aged 34 to 39 years.

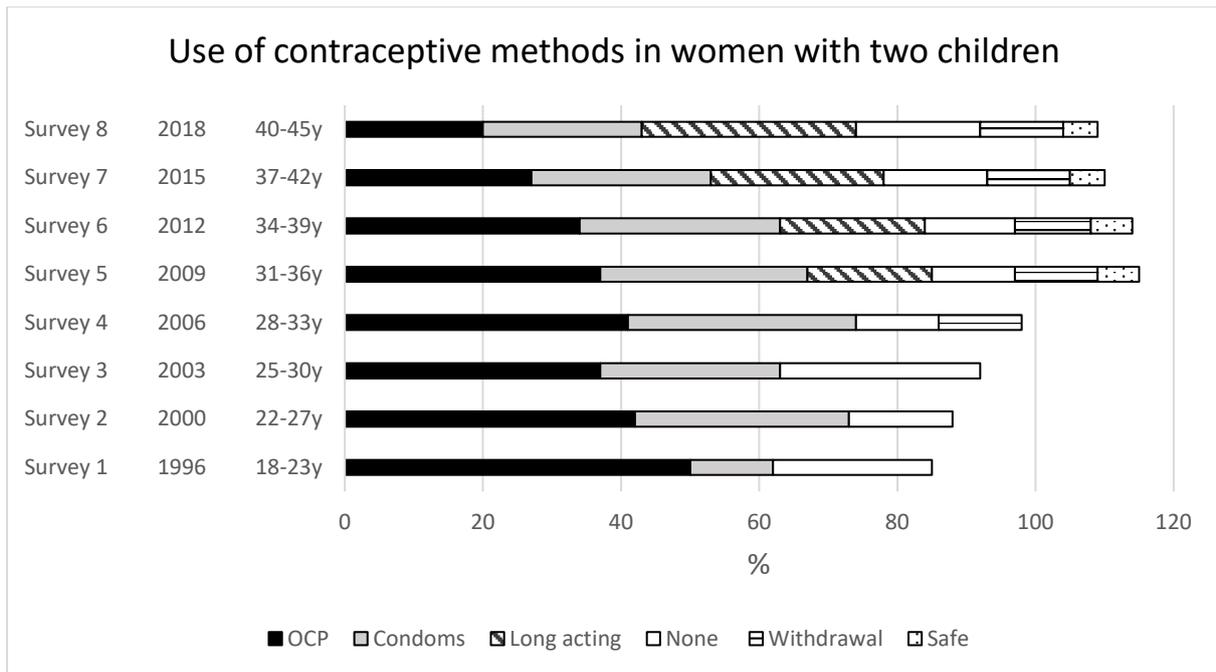


Figure 4-11 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had given birth to two children up to that survey.

Figure 4-11 shows use of contraceptive methods from Survey 1 to Survey 8 when women in the 1973-78 cohort had two children. The figure shows that for women with two children, the OCP, condoms, and no contraception were the predominant methods of contraception used until the women were 25 to 30 years. By Survey 7, almost equal proportions of women used the OCP, condoms, and LARC, with LARC becoming the most prevalent method used as the women aged.

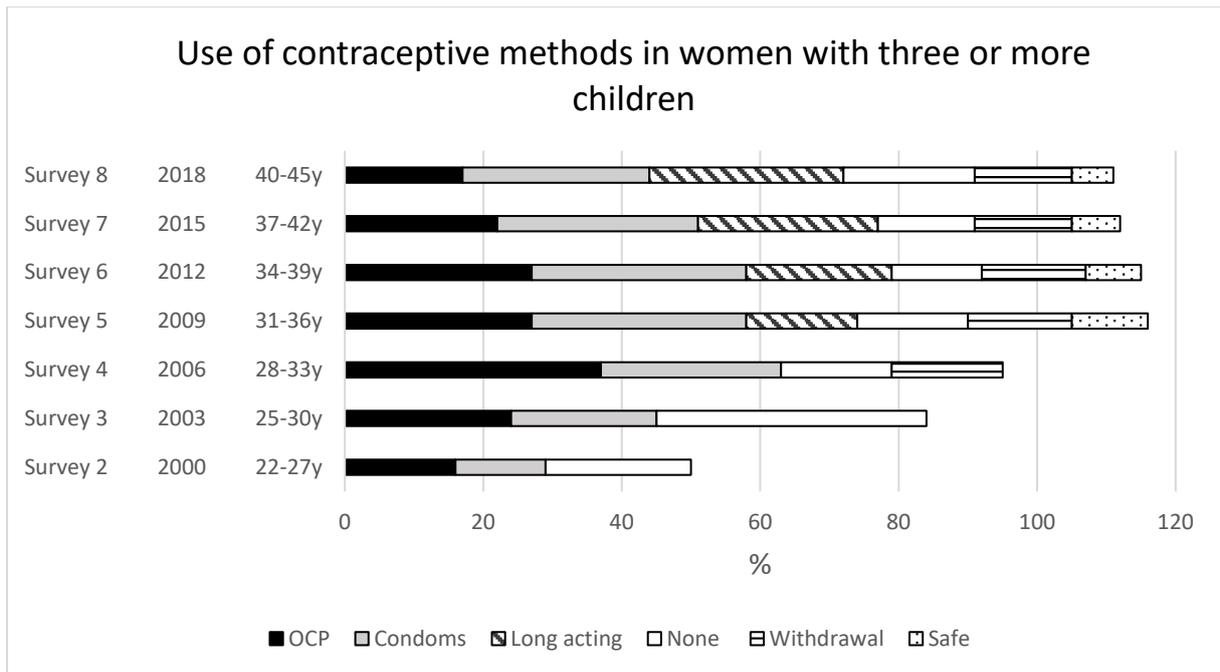


Figure 4-12 Use of contraceptive methods from Survey 2 to Survey 8 among women in the 1973-78 cohort who had given birth to three or more children up to that survey.

Figure 4-12 shows that for women with three or more children, use of no contraception was highest between the ages of 22 to 27 and 25 to 30. These data start from Survey 2, as there were insufficient numbers at Survey 1 (N = 14). Use of the OCP and condoms were the next most prevalent methods used, until the women were 34 to 39 years. Similar to women with two children, by Survey 7, more equivalent proportions of women used the OCP, condoms, and LARC, with LARC and condoms becoming the most prevalent methods used as the women aged.

4.4.2 Use of contraception after reproductive events

The following graphs show the prevalence of contraceptive methods use at each survey by whether the woman had experienced any reproductive event (birth, stillbirth, miscarriage, termination), and then separately by whether a woman had a birth, miscarriage, or a termination at the previous survey, across Surveys 1 (when the women were aged 18 to 23) to 8 (when aged 40 to 45). Stillbirth data were not included due to the very low number of women reporting this experience. For comparison, the

first graph presents data for women who did not experience any of these reproductive events. Note that as women could chose more than one type of contraception at any survey, the percentages do not add up to 100.

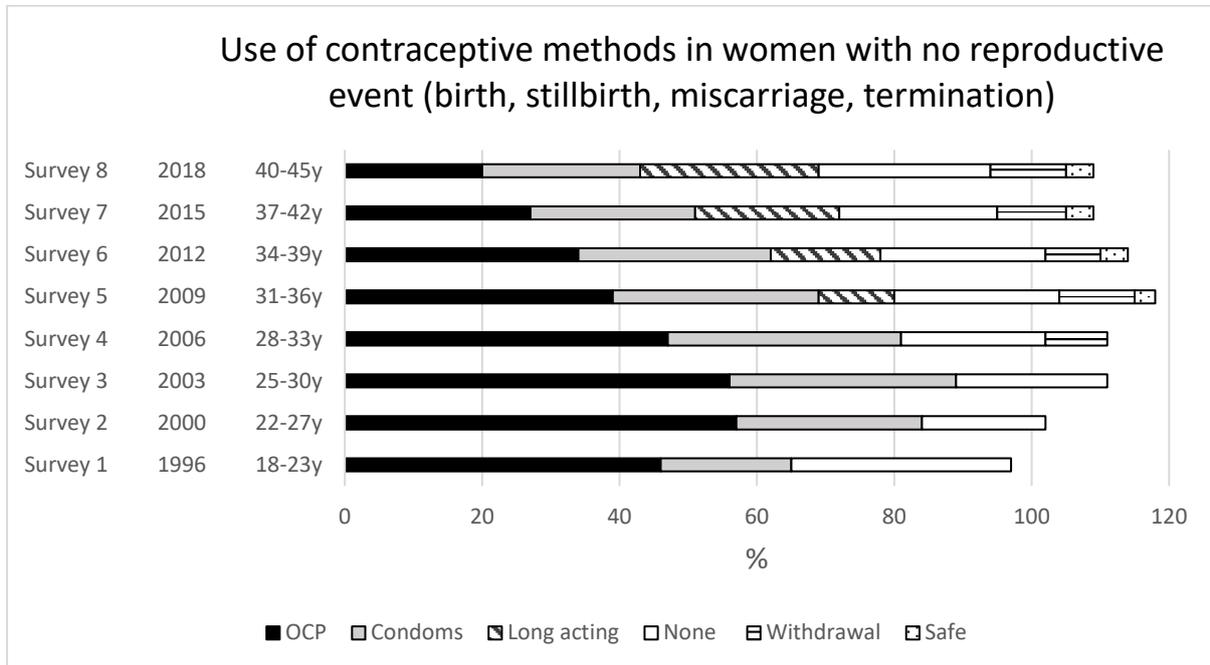


Figure 4-13 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had not experienced a birth, stillbirth, miscarriage, or termination reported at the previous survey.

Figure 4-13 shows that among women who had not experienced any of the specified reproductive events, use of the OCP was the predominant method of contraception, followed by condoms, until the women were in their late thirties and early forties. Use of LARC doubled over time, from when the women were 31 to 36 years to when they were 40 to 45 years. No contraception use steadily rose from Survey 2, becoming the second most prevalent response to questions about contraception when the women were aged 40 to 45 years. Use of the withdrawal and fertility awareness period methods remained steady across the surveys where they were asked.

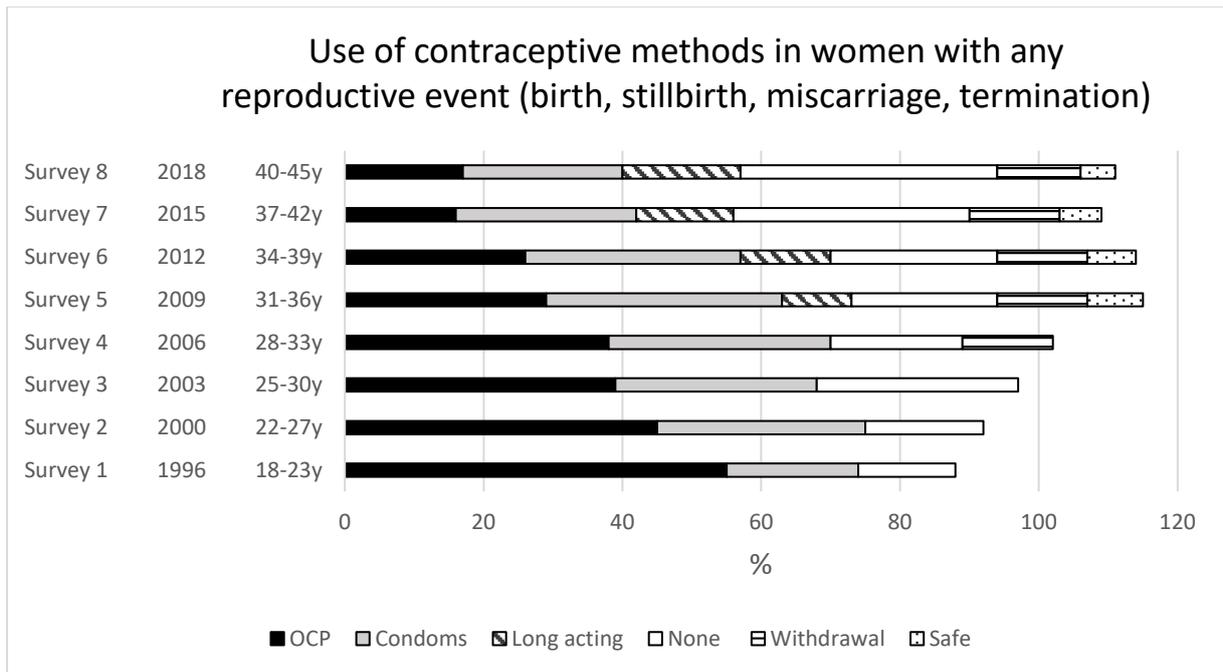


Figure 4-14 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a birth, stillbirth, miscarriage, or termination reported at the previous survey.

This graph shows prevalence of use of contraceptive methods by women who had reported any of the specified reproductive events at the previous survey, from Survey 1 to Survey 8. For women who had experienced any reproductive event in the previous survey, use of the OCP, condoms, or no contraceptive method were the predominant methods of contraception when the women were aged from 18 to 39 years. Use of LARC gradually increased from Survey 5 (when LARC data were first captured) onwards so that by Survey 8, when the women were aged 40 to 45, the rate of LARC use was identical to that of the OCP. Use of the withdrawal and fertility awareness period methods remained steady across the surveys where they were asked.

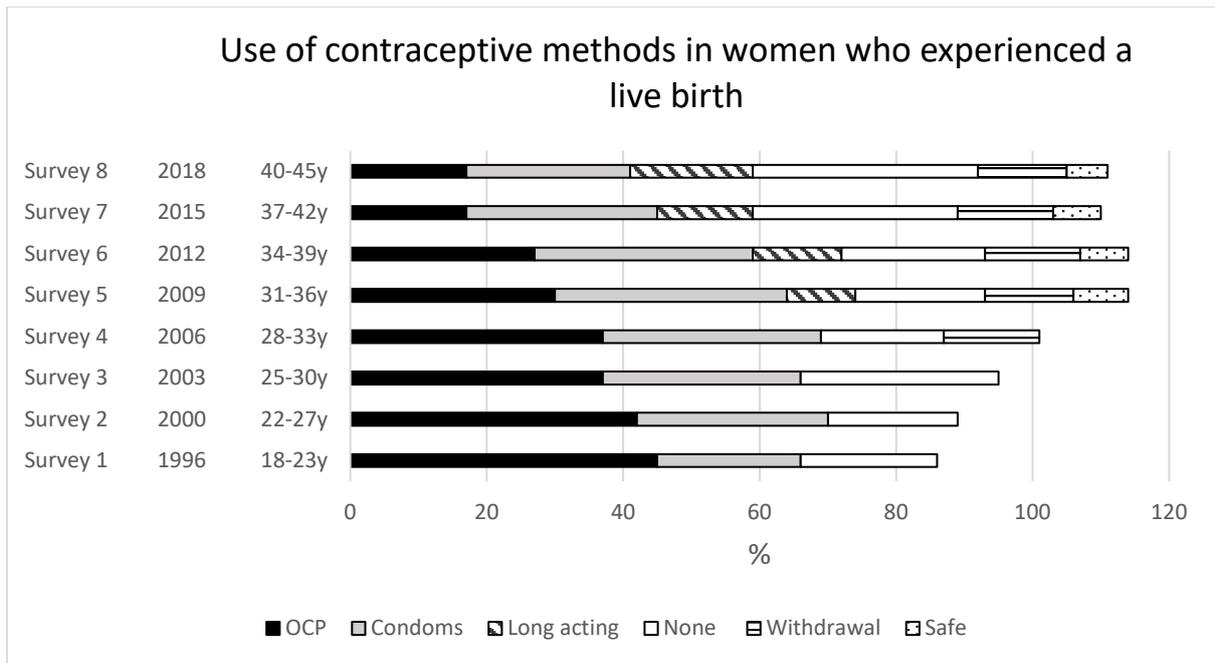


Figure 4-15 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had reported a live birth at the previous survey.

Figure 4-14 shows the OCP and condoms were the main contraceptive methods used by women who had reported a live birth at the previous survey, from when they were 18 to 39 years. After this time, use of no contraception was reported by the most women (about 30%). Use of LARC gradually increased from Survey 5 onwards so that by Survey 8, when the women were aged 40 to 45, LARC use was similar to that of the OCP, but still used less than condoms. Use of the withdrawal and fertility awareness period methods remained steady across the surveys.

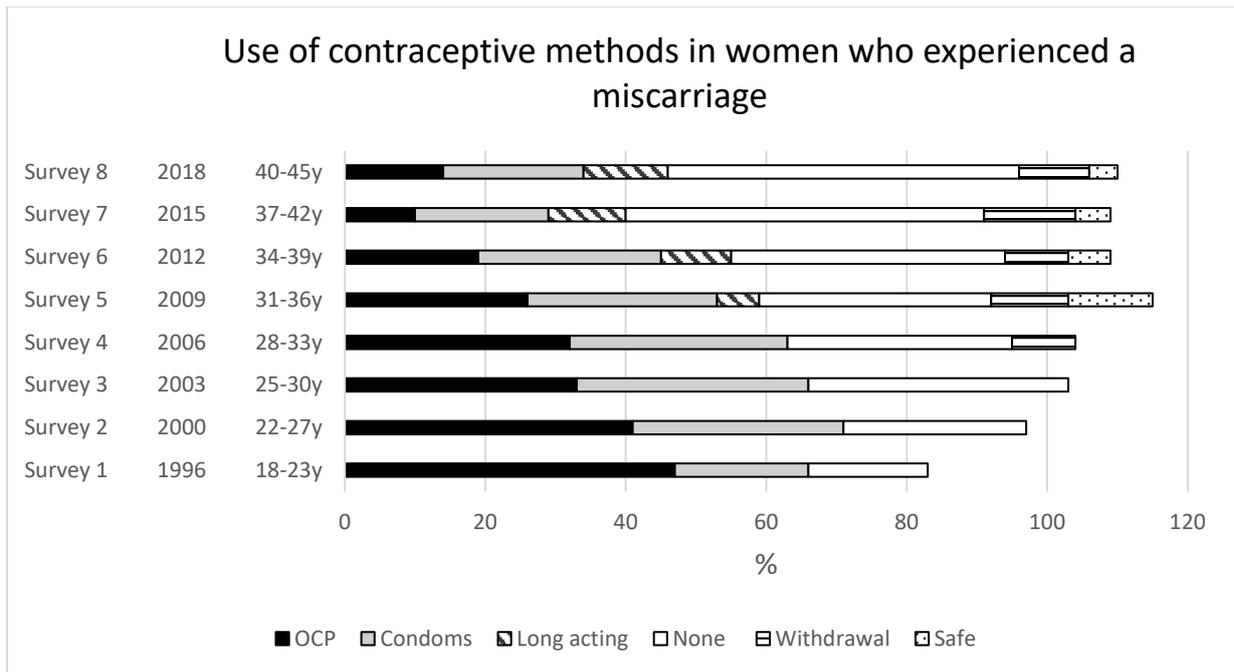


Figure 4-16 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a miscarriage reported at the previous survey.

Figure 4-15 shows that for women who had reported a miscarriage at the previous survey, use of the OCP was the predominant method of contraception at Survey 1, when they were 18 to 23 years of age. From this time onwards, more women reported using condoms or no contraception. By Surveys 7 and 8, about 50% of women used no contraception, while less than 20% used the OCP and condoms. Use of LARC doubled over time, from when the women were 31 to 36 years to when they were 40 to 45 years.

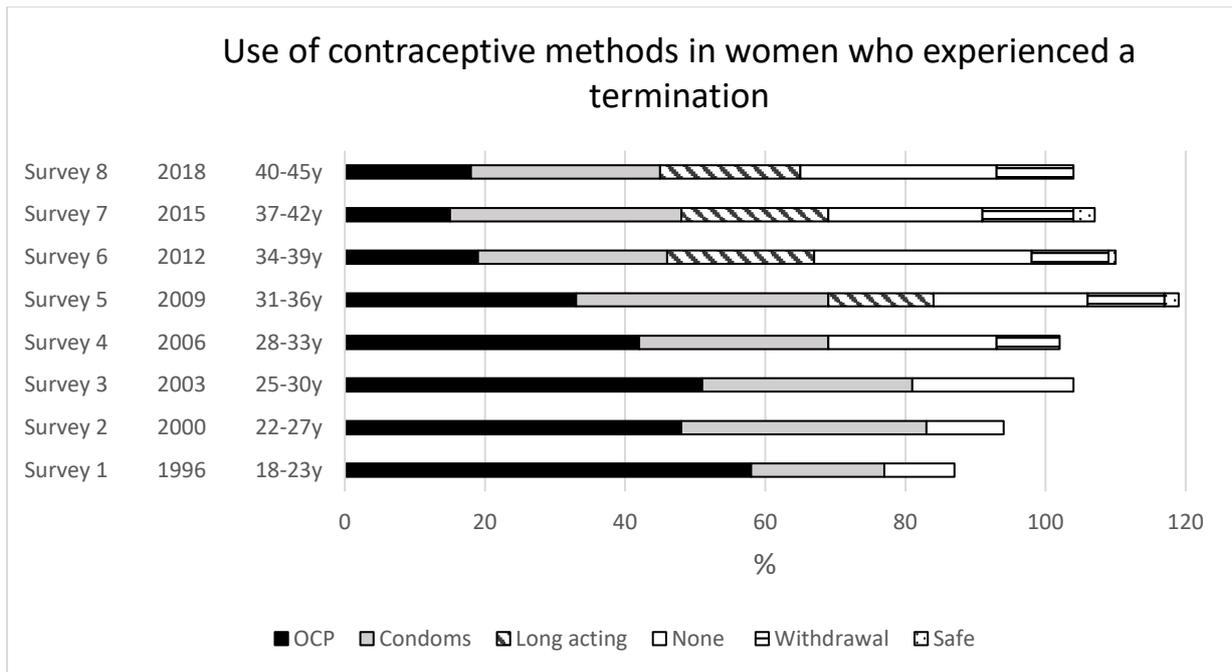


Figure 4-17 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a termination reported at the previous survey.

Figure 4-17 shows that for women who had reported a termination at the previous survey, the OCP and condoms were the predominant methods of contraception used across Surveys 1 to 5 (when the women were aged between 18 and 36 years). After this survey, while use of the OCP dropped, use of condoms remained relatively steady at around 30%. Rates of no contraceptive use increased gradually across the surveys so that by Survey 8, they were equivalent to that of condom use. Use of LARC was reported by around 20% of women aged between 34 and 45 years.

4.5 Summary

This chapter has presented the prevalence of different types of contraception use among women in Australia following various reproductive events. Use of the OCP and condoms across women's reproductive lives was highest in those born 1989-95 and 1973-78 who had not had children or any other reproductive event. For women who had given birth or experienced other reproductive events, different patterns of contraceptive use were evident. In both cohorts, women who had one child were more likely to use no contraception, likely reflecting the desire to have another child or children. In the 1989-95 cohort and 1973-78 cohort, when they were of similar age, women with two children, the use of contraception and no contraception were more equal. For women born 1973-78, those with two or three children showed increasing use of LARC as they aged. Women's use of contraception following reproductive events showed distinct patterns depending on the type of reproductive event. Women in both cohorts who experienced miscarriage were equally likely to use contraception and no contraception, with use of no contraception increasing as they aged. Of women who experienced a termination however, use of LARC was notably higher at younger ages in both cohorts. Longitudinal analysis of trends in LARC use is presented in the next chapter.

5. TRENDS IN WOMEN'S USE OF LARC METHODS

Authors: Julie Byles, Nicholas Egan, Isabelle Barnes, Melissa Harris

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](#).

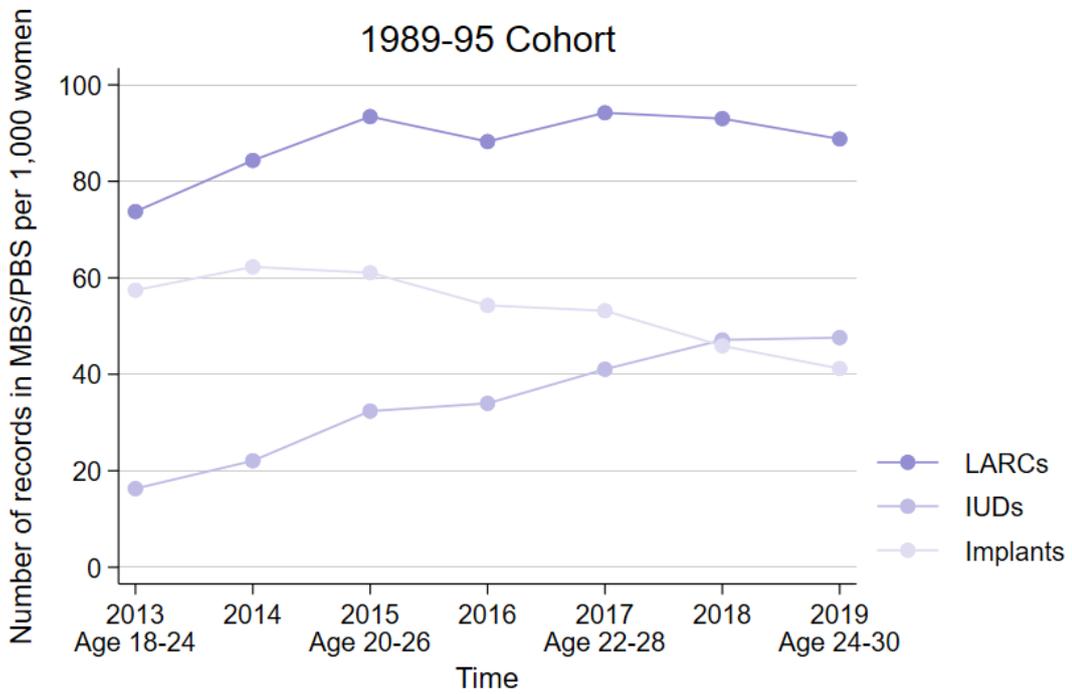
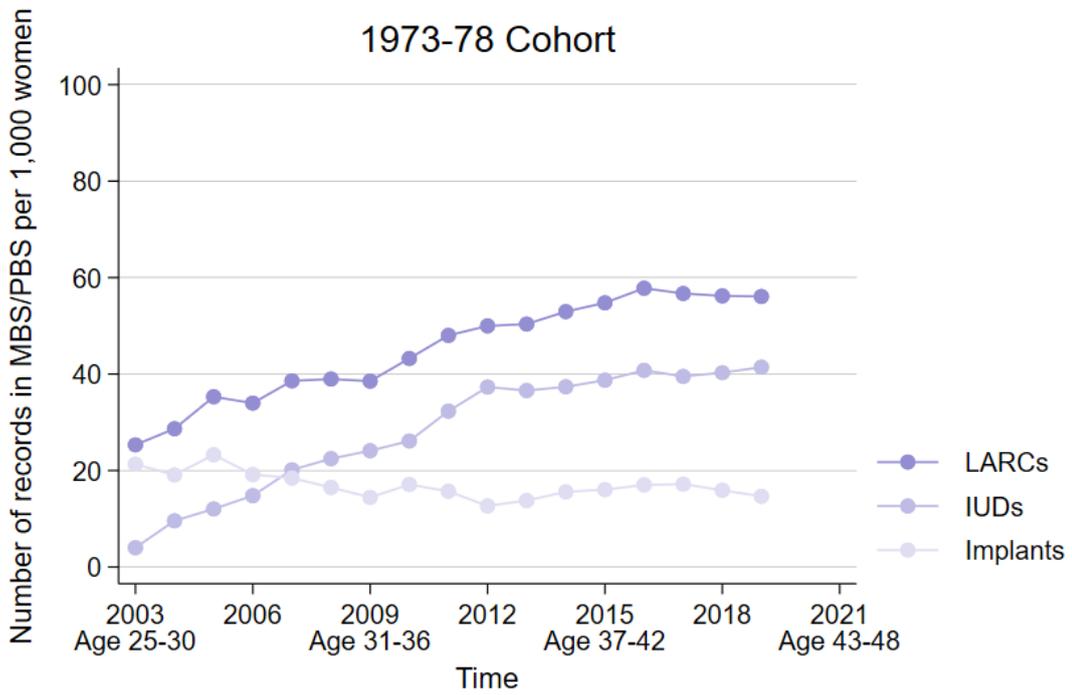


Figure 5-1 Trends in MBS or PBS items for LARCs over time, expressed as the number of items per 1000 women for each year.

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.

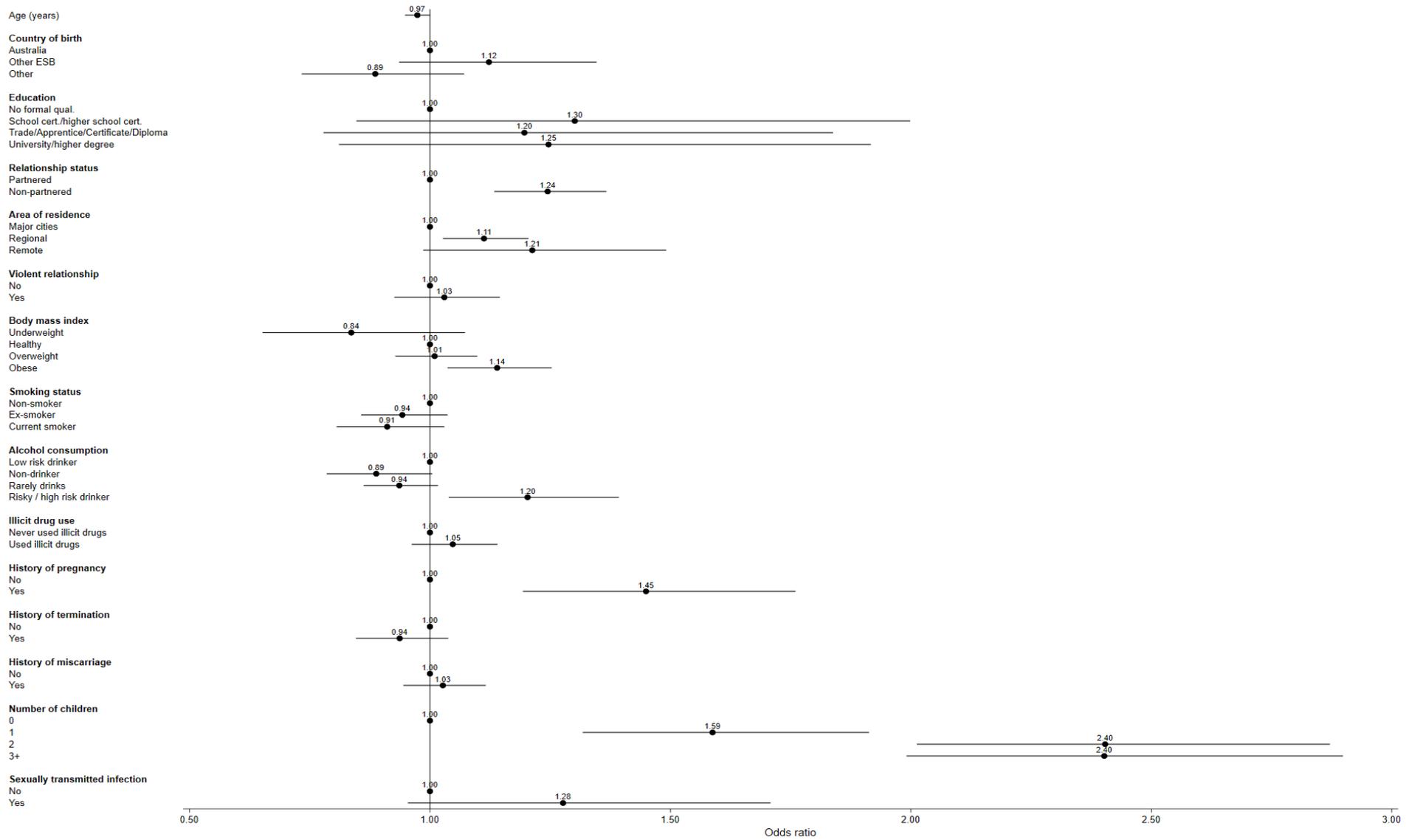


Figure 5-2 GEE estimates and 95% CIs for LARC insertions (both IUDs and implants) among the 1973-78 cohort.

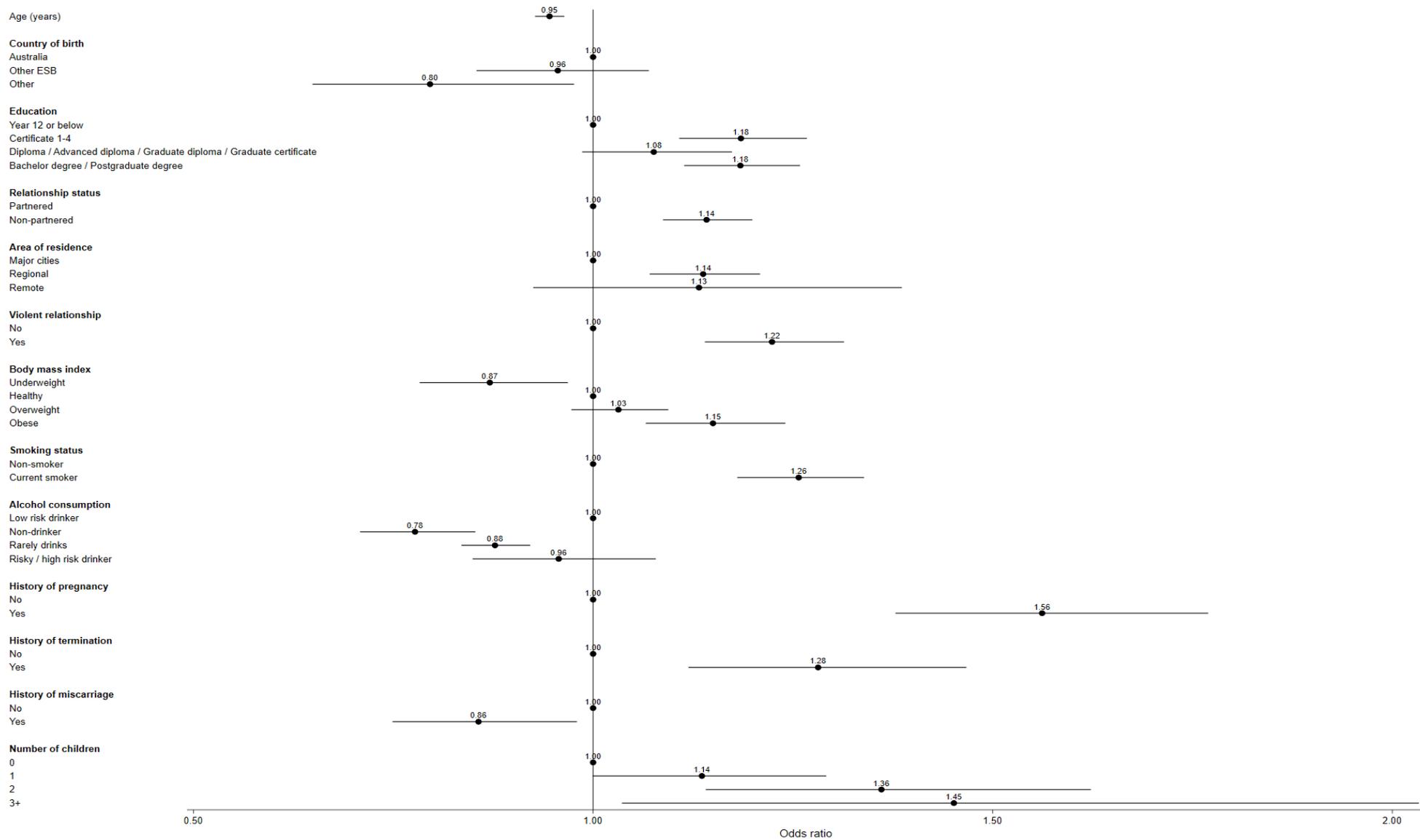


Figure 5-3 GEE estimates and 95% CIs for LARC insertions (both IUDs and implants) among the 1989-95 cohort.

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.

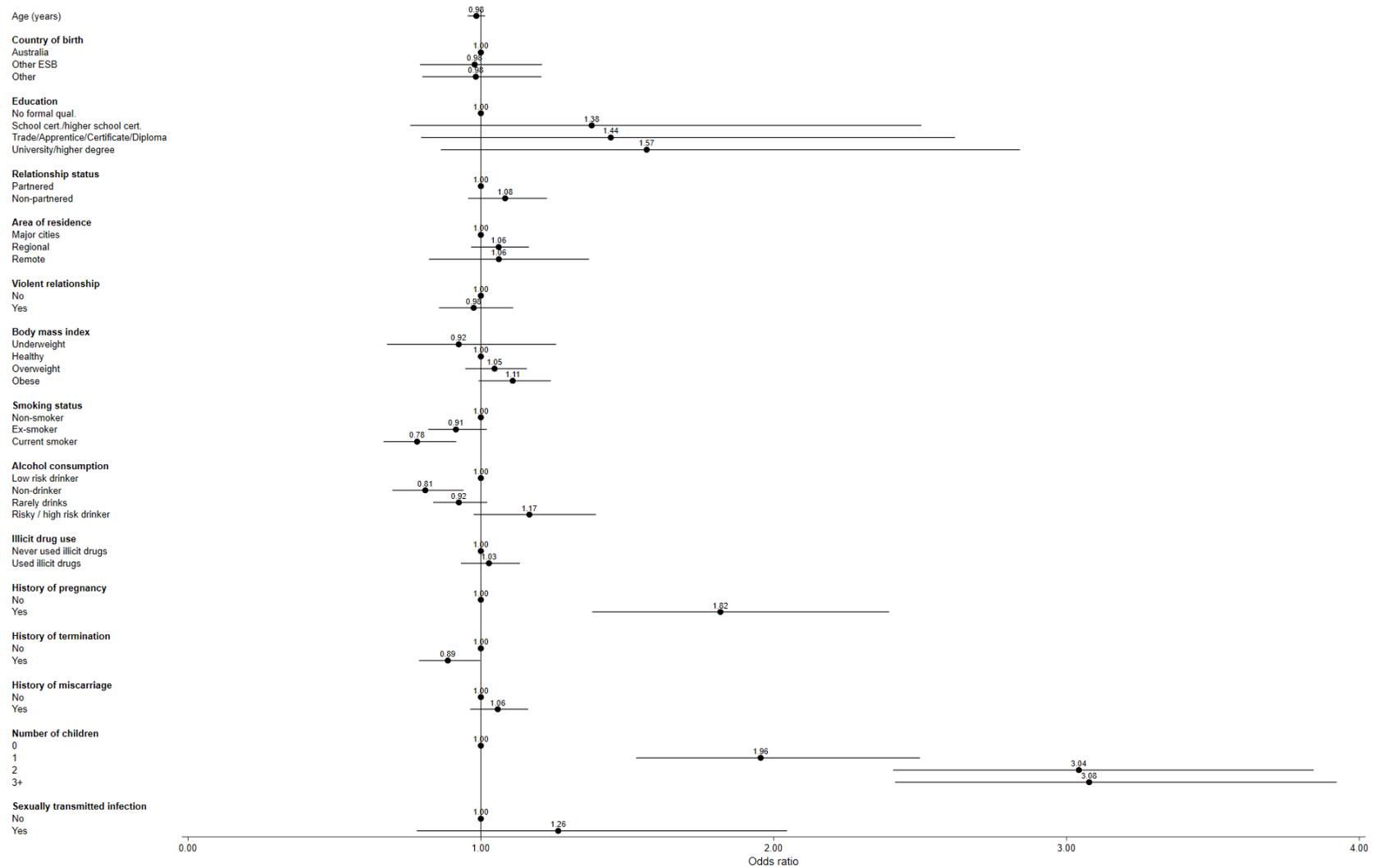


Figure 5-4 GEE estimates and 95% CIs for IUD insertions among the 1973-78 cohort.

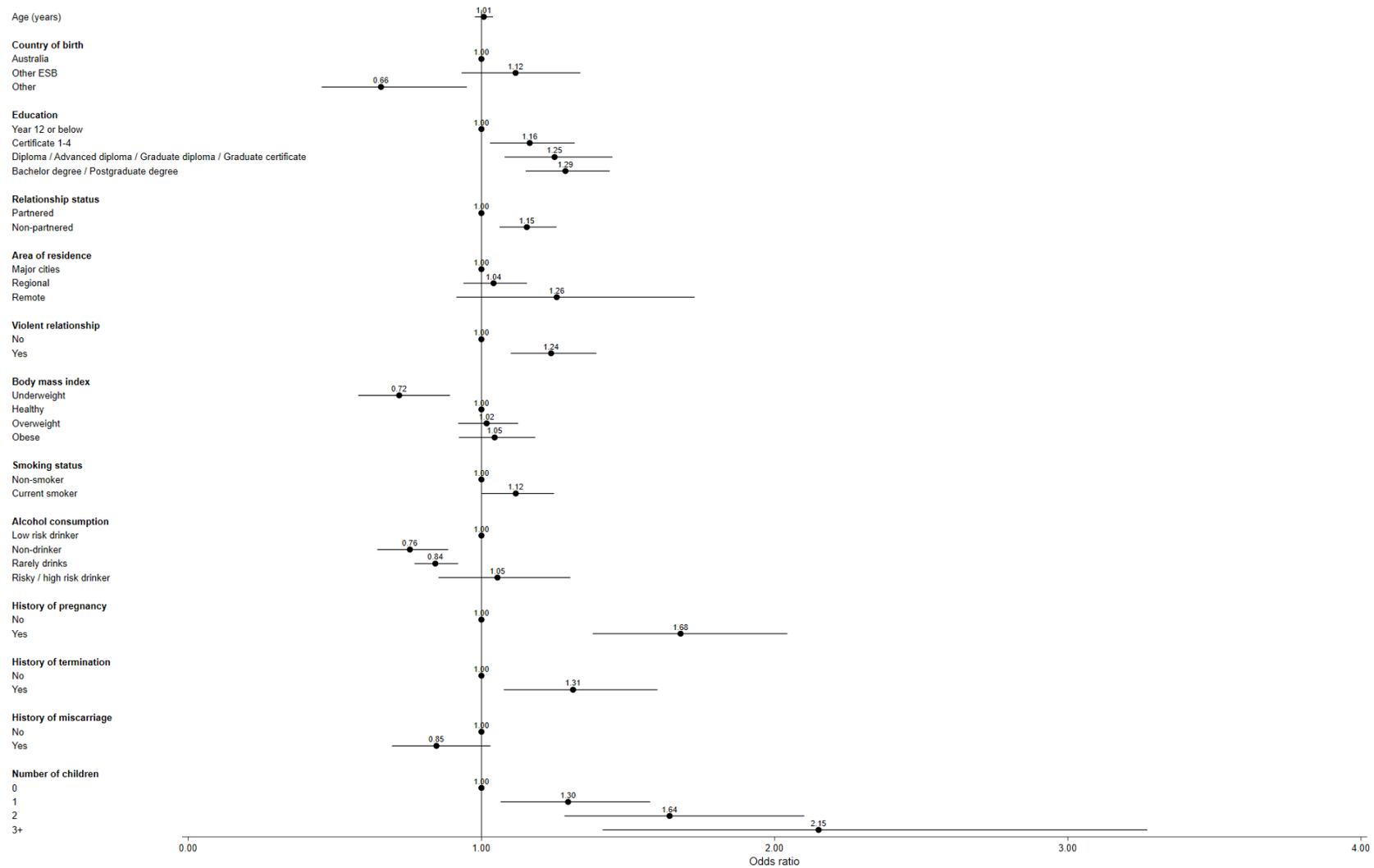


Figure 5-5 GEE estimates and 95% CIs for IUD insertions among the 1989-95 cohort.

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.

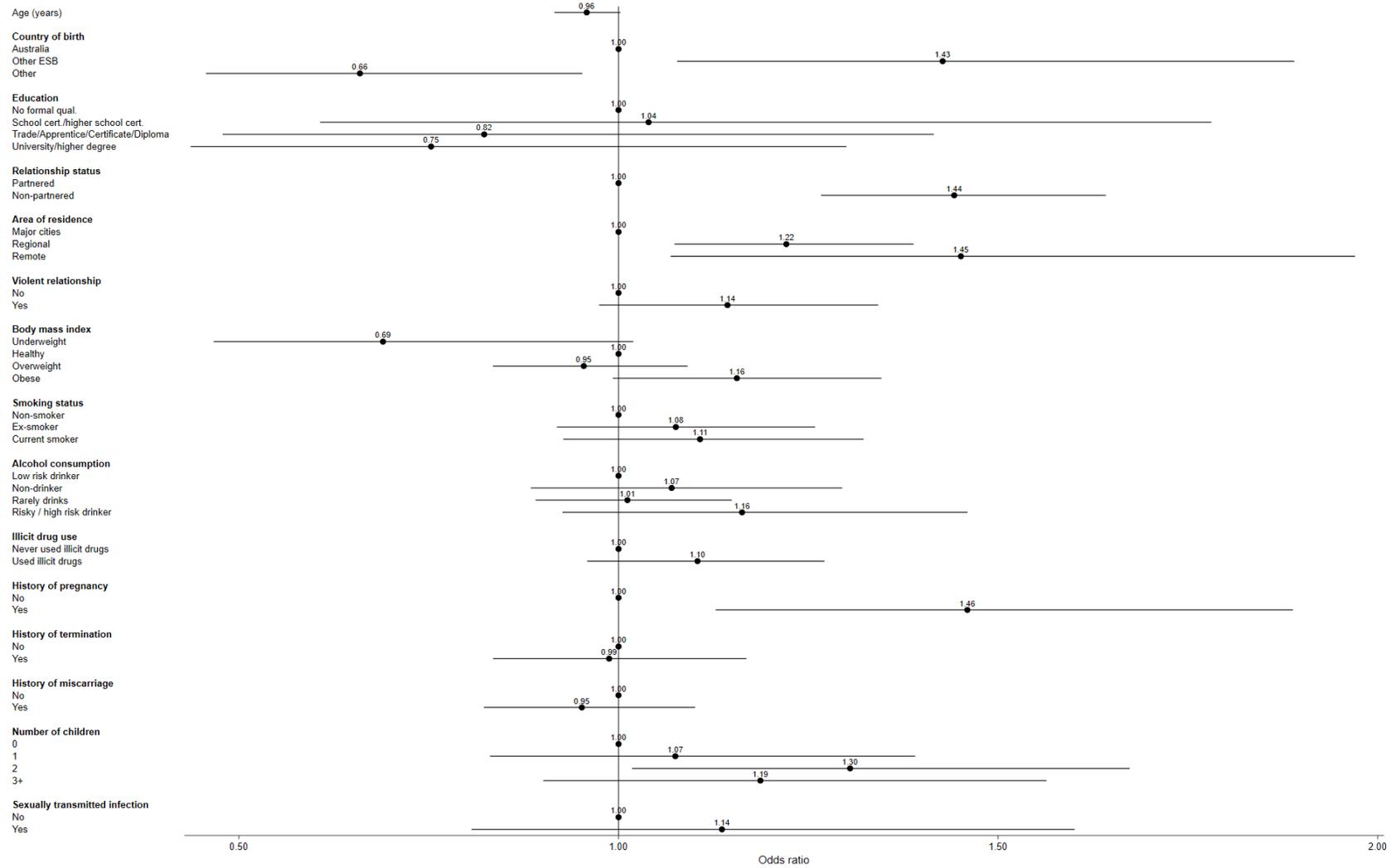


Figure 5-6 GEE estimates and 95% CIs for implant insertions among the 1973-78 cohort.

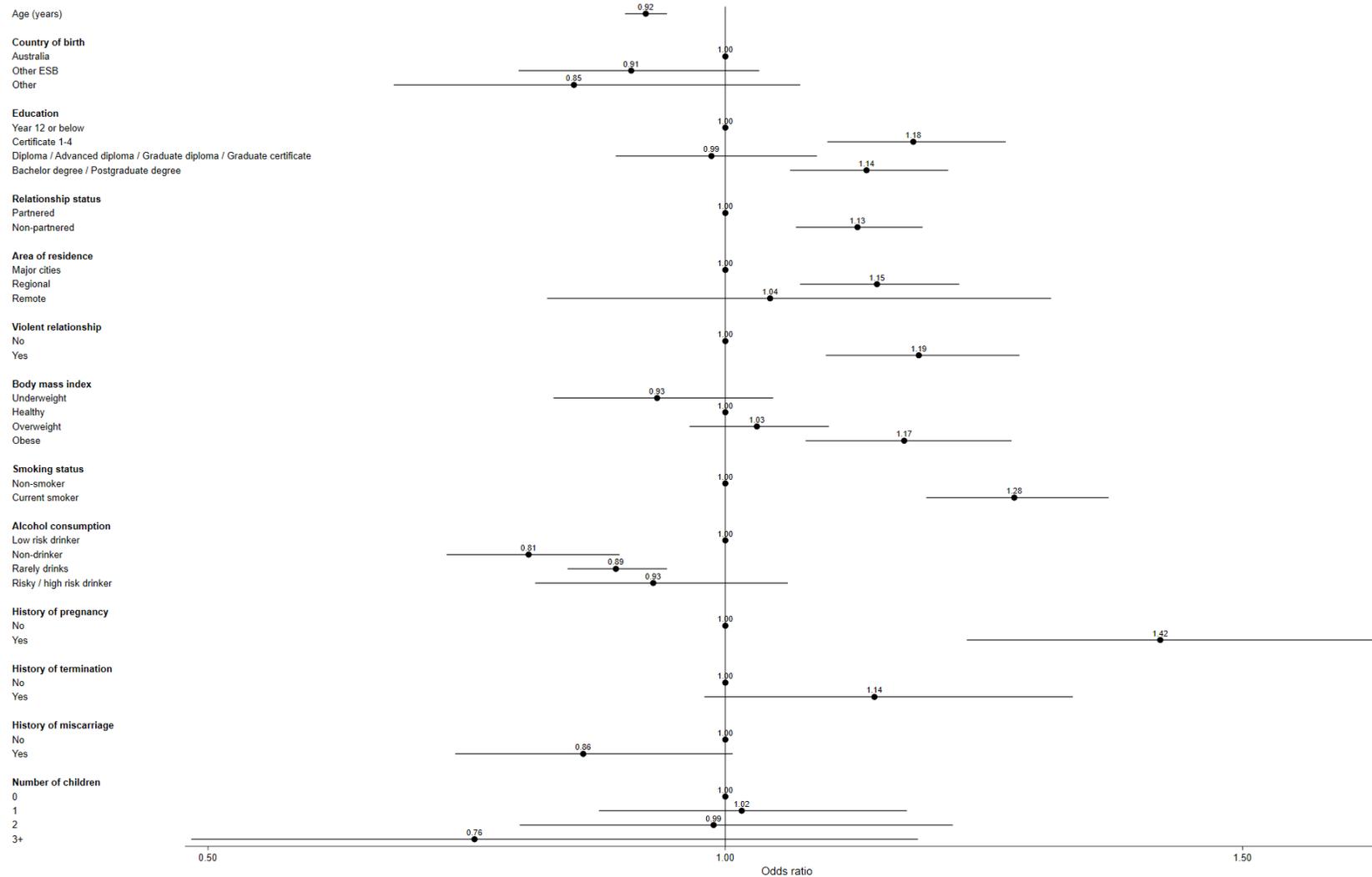


Figure 5-7 GEE estimates and 95% CIs for implant insertions among the 1989-95 cohort.

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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6. SHORT AND LONG TERM USE OF THE OCP

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6.1 Key findings

- For women born 1989-95 and 1973-78, around 50% of OCP use periods involved a single script. Women may have switched to another OCP not listed on the PBS, or may have transitioned to another form of contraception (e.g., LARC), or ceased using contraception.
- One third (35%) of women born 1989-95 only used OCPs for short periods of time (150 days or less).
- Women born 1989-95 who used an OCP in the short-term were more likely to have a certificate/diploma (although similar numbers had a university degree), to be partnered, and to have previously been in a violent relationship than women who used an OCP in the long-term (>150 days).
- Compared to women born 1989-95 who used an OCP in the long-term (>150 days), those who used an OCP in the short-term were more likely to be psychologically distressed, to have poor to fair general health, to report a chronic condition, and to have had a previous miscarriage or termination.
- Women born 1989-95 who used an OCP for a short period of time were more likely to smoke tobacco, be non-drinkers, and have a slightly higher BMI than women who used OCP for a long period of time (>150 days).
- In the 1973-78 cohort, 38% of women only used OCPs in the short-term (150 days or less).
- Where women used the OCP for longer than 150 days (long-term use), the median length of OCP use was 503 days for women in the 1989-95 cohort, and 575 days for women in the 1973-78 cohort.
- Among women in the 1989-95 cohort who used an OCP in the long-term, duration of OCP use was shorter for women who were older, had a higher BMI, or who smoked or used illicit drugs.

- Among women in the 1973-78 cohort who used an OCP in the long-term, duration of use of OCP was shorter for women who had poorer mental health, did not live in outer regional or remote areas, had been in a violent relationship, or had endometriosis or PCOS.
- PBS data may underestimate OCP use, since not all OCPs are covered by the PBS. However, the difference in OCP users identified through the PBS and those who report OCP use in the ALSWH surveys with no PBS records for OCP use are small. The main differences appear to be that the PBS OCP data may slightly over-represent women who have more children and more socio-economic disadvantage.

6.2 Introduction

This chapter examines the long-term use of oral contraceptives, and compares trends in use over time for two different cohorts of women born 1989-95 and 1973-78. The use of oral contraceptives was determined from claims made to the PBS. However, these data may underestimate OCP use if women are using medications which do not attract a PBS benefit. For this reason, the chapter also includes a comparison between PBS data and self-reported OCP use captured by the ALSWH surveys ([Section 6.4.1](#)).

The prevalence of self-reported use of the OCP has been presented in [Chapter 2](#). The results presented in this chapter may vary from the self-reported prevalence since there may be some underestimation of OCP use in the PBS data, because the analysis is restricted to women who are eligible for linkage to PBS and to women who meet eligibility criteria for the time to event analyses that have been applied in the current chapter.

The purpose of the current chapter is to examine how long women remain on the OCP and what factors are associated with longer duration of use. Following a summary of previous relevant ALSWH publications, analyses of ALSWH survey and linked PBS data are reported.

6.3 Previous ALSWH OCP research

Duration of OCP use has previously been examined among the 1973-78 cohort. These women have provided data on current and past OCP use at multiple surveys. Khan et al. (2005) investigated duration of OCP use among 9,582 women from the 1973-78 cohort. Nearly half of the women (48%) reported OCP use of five years or more. Longer OCP use was associated with higher odds of genital herpes and genital warts, compared to those who had used the OCP for less than one year. Duke et al. (2007) explored the relationship between OCP use and depressive symptoms among 9,081-9,688 women from the same cohort. Approximately 62% of women reported using the OCP when aged 22-27 at Survey 2 (2000) and 56% when aged 25-30 at Survey 3 (2003). Results showed an inverse relationship between depressive symptoms and number of years of OCP use, however, there was no independent effect after adjusting for confounders (Duke et al., 2007).

More recently, Tu et al. (2014) examined the relationship between endometriosis and prior OCP use. Data from 9,585 women from the 1973-78 cohort were examined between 1996 and 2006. By age 28-33, 95% of women with endometriosis reported having ever used the OCP, compared to 91% of those who did not have endometriosis. After adjusting for confounders, OCP use duration was shown to be associated with endometriosis, with effect modification for parity. OCP use for more than five years resulted in a higher risk of endometriosis among nulliparous women, and a lower risk among parous women (Tu et al., 2014).

6.4 PBS data and ALSWH survey data on oral contraceptives

Prior to July 2012, the PBS did not include data on scripts that fell below the co-payment threshold, and so prescriptions for oral contraceptives prior to July 2012 may be underestimated in the PBS data. Given this potential under-representation of oral contraceptive use prior to 2012 (see [Appendix 11.5.1](#)), analyses included in this chapter were restricted to data collected after June 2012 (until mid-2019). It should also be noted that even after 2012, not all OCPs are listed on the PBS, resulting in some underestimation of OCP use. For more information on the PBS item numbers

for oral contraceptives, see [Appendix 11.5.2](#). The ALSWH survey items used to collect data on OCP use are included in [Appendix 11.5.3](#).

6.4.1 Agreement between PBS data on OCP use and women's self-report of OCP use.

To estimate the potential for PBS data to under-estimate OCP use, we compared women's self-reported use of oral contraception from their surveys to the use of OCP as ascertained from the PBS records.

We estimated upwards of 30% of women who reported using an OCP in an ALSWH survey did not have their prescription supplied through the PBS ([Appendix 11.5.4](#)). Also, 25-30% of women who were supplied an OCP script through the PBS in the year prior to survey completion did not report it as the contraception they were currently using (1973-78 cohort) or had used the last time they had vaginal sex (1989-95 cohort) ([Appendix 11.5.5](#)). This resulted in an overall percentage agreement between self-report (survey) and PBS data of 72-75% for the 1989-95 cohort and 85-92% for the 1973-78 cohort, depending on the survey wave (see [Appendix 11.5.6](#)).

The disparity between reporting of oral contraceptive use in the ALSWH surveys and PBS data may be due to a time lag between having a script supplied through the PBS and completing the ALSWH survey; having a script supplied but not actually taking the medication; or using an oral contraceptive that is not listed on the PBS. Any analysis of PBS data relating to oral contraceptive use may therefore under or overestimate oral contraceptive use. Despite this limitation, analysis of PBS data for OCP has a great advantage in providing information on duration of use. Further, we have also been able to quantify and describe the characteristics of women who may be more likely to be under-represented in the PBS data. These comparisons are described below, and show a small difference with the effect that PBS data may slightly over-represent women who have more children and less socio-economic advantage.

6.5 Cross-sectional comparison of women who do and do not use oral contraceptives supplied through the PBS

Both the 1989-95 and 1973-78 cohorts were surveyed in 2015 (Survey 3 for the 1989-95 cohort, and Survey 7 for the 1973-78 cohort). Using information regarding contraceptive use from these surveys, and linked PBS data for the previous year, women were classified into three categories:

1. Women who were supplied an OCP through the PBS in the year prior to survey completion, regardless of what they reported in the ALSWH survey (PBS users).
2. Women who were not supplied an OCP through the PBS in the year prior to survey completion, but had indicated OCP use in the ALSWH survey (survey users).
3. Women who were not supplied an OCP through the PBS in the year prior to survey completion and had not indicated OCP use in the ALSWH survey (non-users).

In the 1989-95 cohort, 43% of women were supplied an OCP through the PBS in the year prior to survey completion (PBS users); 16% were not supplied an OCP through the PBS in the year prior to survey completion, but had indicated OCP use in the ALSWH survey (survey users); and 41% did not use an OCP (non-users). In the 1973-78 cohort, 21% of women were supplied an OCP through the PBS in the year prior to survey completion (PBS users); 6% were not supplied an OCP through the PBS in the year prior to survey completion, but had indicated OCP use in the ALSWH survey (survey users), and 73% did not use an OCP (non-users). Demographic characteristics and health behaviours were compared between the three groups for both cohorts. All results are reported in [Appendix 11.5.7](#), with significant results reported here in Table 6-1 and Table 6-2.

As shown in Table 6-1, in the 1989-95 cohort at Survey 3 (2015) women who were not supplied an OCP through the PBS in the year prior to survey completion, but had

indicated OCP use in the ALSWH survey (survey users) had the lowest mean K10¹³ score, the lowest proportion of women from outer regional/remote areas, the lowest percentage of women with fair/poor self-rated general health, the highest percentage of never smokers, the lowest percentage of non-drinkers, highest percentage of women with a university degree, lowest percentage of partnered women, the highest percentage of women who found managing on their available income easy/not too bad, the lowest percentage of women who had been in a violent relationship, and the lowest percentage of previous terminations and miscarriages across the three OCP user groups. While these differences are statistically significant, due to the large number of women in the cohort, few of these differences are large. The main differences appear to be that the PBS data may slightly over-represent women who have more children and less socio-economic advantage.

In addition to differences in socio-economic factors for women who were supplied an OCP through the PBS in the year prior to survey completion (PBS user), and women who identified OCP use only in the ALSWH survey (survey user), there were also many differences between women using the OCP (either PBS user or survey user) and those women who had not been supplied with a PBS script or reported OCP in the survey (non-users). Non-users tended to have more children, have a higher BMI, smoke more tobacco, have less education, be more likely to come from a non-English speaking background, and be more likely to have experienced violence, miscarriage, or termination.

¹³ The K-10, or Kessler Psychological Distress Scale, indicates a higher degree of psychological distress with higher scores. Therefore, the lowest score reported here indicates that this group, on average, reported the lowest level of psychological distress.

Table 6-1 Significant demographic, health behaviour and health risk factors by OCP use for the 1989-95 cohort at Survey 3 (2015)

1989-95 cohort	Type of OCP user		
	PBS user	Survey user	Non-user
	<i>Mean</i>	<i>Mean</i>	<i>Mean</i>
Age	22.9	23.1	23.1
Number of children	0.1	0.03	0.2
Kessler psychological distress scale score	21.5	21.0	22.1
BMI	24.9	24.0	25.4
Physical activity (metabolic minutes in previous week)	1,450.2	1,480.2	1,477.3
Area of Residence (ARIA+)	%	%	%
<i>Major City</i>	72.8	78.1	72.8
<i>Inner regional</i>	18.9	13.9	16.7
<i>Outer regional/remote</i>	7.6	6.2	8.7
Self-rated general health			
<i>Excellent/Good</i>	83.0	86.3	81.9
<i>Fair/poor</i>	17.0	13.7	18.1
Smoking status			
<i>Never smoker</i>	73.8	78.3	71.0
<i>Ex-smoker</i>	8.4	7.9	9.3
<i>Current smoker</i>	17.3	13.8	19.0
Pattern of alcohol consumption			
<i>Low long-term risk, drinks at short-term risk less than weekly</i>	82.5	84.1	77.7
<i>Non-drinker</i>	5.5	4.7	11.5
<i>Low long-term risk, drinks at short-term risk weekly or more</i>	9.0	9.0	7.1
<i>Risky/high risk drinker</i>	2.5	2.2	2.9
Illicit drug use in the past 12 months			
Yes	33.7	34.2	32.0
Education level			
<i>School based qualification or below</i>	30.5	25.7	30.1
<i>Certificate or Diploma</i>	29.2	22.9	31.5
<i>University degree</i>	37.3	48.5	35.0
Partnered			
Yes	32.8	28.6	30.7

1989-95 cohort	Type of OCP user		
	PBS user	Survey user	Non-user
Ability to manage on income			
<i>Impossible/difficult</i>	54.0	48.2	53.9
<i>Easy/not too bad</i>	43.1	48.9	42.6
Country of birth*			
<i>Australia</i>	83.5	79.5	78.6
<i>Other English-speaking country</i>	3.6	5.6	4.3
<i>Non-English-speaking country</i>	1.5	2.5	3.3
Ever been in a violent relationship			
Yes	12.1	9.7	14.5
Previous termination			
Yes	5.4	5.1	9.4
Previous miscarriage			
Yes	5.8	3.9	8.5

Note: Percentages do not add to 100 as missing data are not displayed.

Figure 6-1 compares the chronic conditions reported by women according to the three groups of women (PBS users, survey users, and non-users). Non-users had the highest prevalence of all of the chronic conditions.

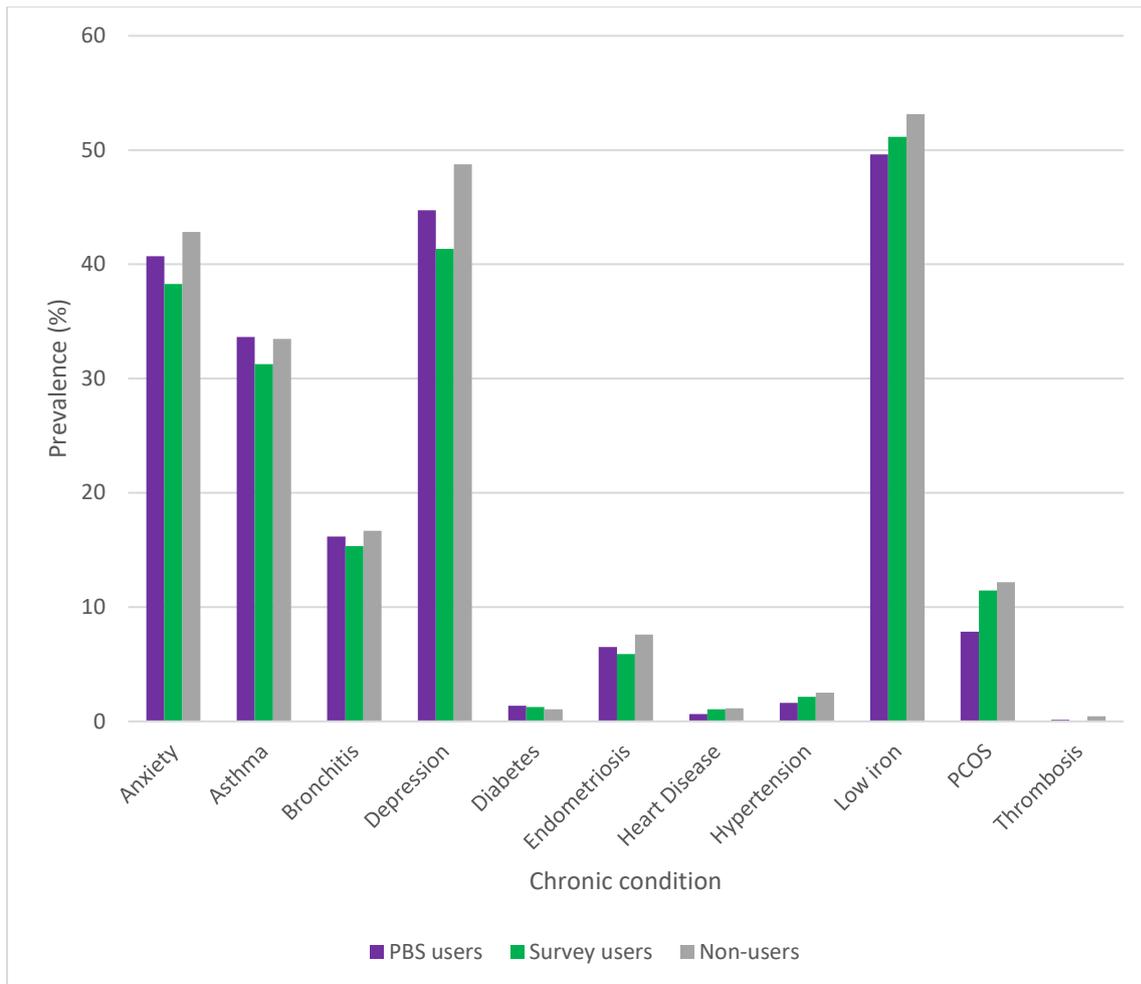


Figure 6-1 Prevalence of chronic conditions by OCP use for the 1989-95 cohort at Survey 3 (2015).

The significant differences for the 1973-78 cohort are shown in Table 6-2. As with the 1989-95 cohort, the size of the differences is small. However, the differences do show greater disadvantage among women who were supplied an OCP through the PBS in the year prior to survey completion (PBS users) when compared to women who were not supplied an OCP through the PBS but had indicated OCP use in the ALSWH survey (survey users).

Survey users had the lowest average number of children, lowest proportion of women from outer regional/remote areas, lowest percentage of women with fair or poor self-rated general health, lowest percentage of current smokers, lowest percentage of non-drinkers, highest percentage of university educated women, lowest percentage of partnered women, highest percentage of women that found it easy/not too bad to

manage on the income they had available, the lowest percentage of women who had been in a violent relationship and the lowest percentage of previous miscarriages, when compared with PBS users and those who did not use an OCP (non-users).

Table 6-2 Significant demographic, health behaviour and health risk factors by OCP use for the 1973-78 cohort at Survey 7 (2015)

1973-78 cohort	Type of OCP user		
	PBS user 21.2%	Survey user 5.4%	Non-user 73.4%
Mean Age	39.5	39.3	39.7
Physical Activity (Mean METMIN)	1,039.03	1,260.03	1,052.13
Number of children	1.74	1.43	1.84
Area of Residence (ARIA+)	%	%	%
<i>Major City</i>	54.89	58.02	55.95
<i>Inner regional</i>	26.25	24.06	26.49
<i>Outer regional/remote</i>	18.26	10.14	14.26
Self-rated general health			
<i>Excellent/Good</i>	86.87	91.75	89.08
<i>Fair/poor</i>	12.77	8.25	10.63
Smoking status			
<i>Never smoker</i>	58.89	67.92	58.15
<i>Ex-smoker</i>	27.21	25.47	27.54
<i>Current smoker</i>	10.62	5.9	10.83
Pattern of alcohol consumption			
<i>Low long-term risk, drinks at short-term risk less than weekly</i>	76.13	77.83	74.72
<i>Non-drinker</i>	8.23	7.78	10.9
<i>Low long-term risk, drinks at short-term risk weekly or more</i>	4.47	8.02	4.77
<i>Risky/high risk drinker</i>	7.94	6.13	6.16
Education level			
<i>School based qualification or below</i>	13.31	10.14	11.09
<i>Certificate or Diploma</i>	35.8	23.35	31.08
<i>University degree</i>	50.89	66.51	57.83
Ability to manage on income			
<i>Impossible/difficult</i>	43.91	35.38	40.85
<i>Easy/not too bad</i>	51.79	63.21	53.52

1973-78 cohort	Type of OCP user		
	PBS user 21.2%	Survey user 5.4%	Non-user 73.4%
Country of birth			
<i>Australia</i>	95.53	93.87	91.84
<i>Other English-speaking country</i>	2.39	2.36	4.06
<i>Non-English-speaking country</i>	1.61	2.36	3.51
Partnered			
Yes	74.88	72.41	75.67
Ever been in a violent relationship			
Yes	15.57	12.03	13.91
Previous miscarriage			
Yes	32.88	25.24	35.47

Note: Percentages do not add to 100 as missing data are not displayed.

Figure 6-2 compares the chronic conditions reported by women across the OCP user groups. PBS users were more likely to have hypertension, low-iron and PCOS compared to the other two groups (survey users and non-users).

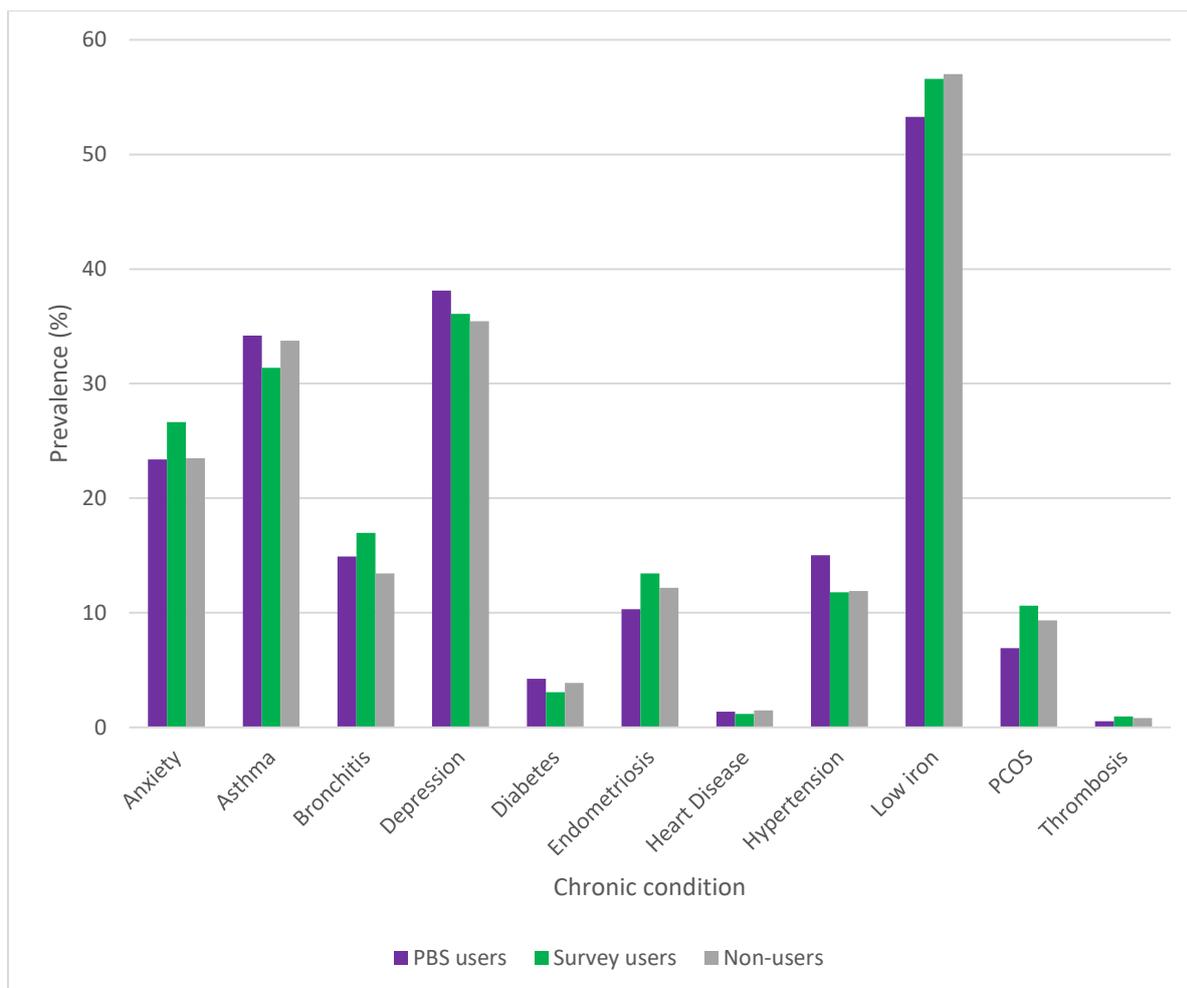


Figure 6-2 Prevalence of chronic conditions by OCP use for the 1973-78 cohort at survey 7 (2015).

6.6 Comparison of women who use oral contraceptives in the long- and short-term

The remainder of this chapter will focus on women’s use of the OCP as identified in the PBS data. The methods used to determine periods of OCP use are described in [Appendix 11.5.8](#). More than 99% of the OCP scripts supplied to women from 1 July 2012 to 30 June 2019 contained 112 pills (four 28 pill packs), which is sufficient supply for 80% of 140 days. Therefore, short-term OCP use was defined as 150 days or less, or equivalent to less than 6-months of use, and this usually represented a single script.

Out of the 7,275 unique OCP users in the 1989-95 cohort, 2,521 (34.7%) only ever used OCP for a short-term. Out of the 1,696 unique OCP users in the 1973-78 cohort,

651 (38.4%) only ever used OCP for a short-term. To compare the women who only ever used an OCP for a short-term with those that had used an OCP for a long-term at least once, demographic characteristics, health behaviours, health risk factors and chronic conditions were taken from the ALSWH survey that preceded (within three years) either the first period of use longer than 150 days (if women had used an OCP for a long-term), or their first period of OCP use (if women had only used OCP for a short-term).

6.6.1 1989-95 Cohort

In the 1989-95 cohort, 65.4% of women used an OCP for a long-term, and 34.7% used an OCP for a short-term. Women who used OCP for a short-term reported higher psychological distress, higher BMI, more children, and commenced using an OCP later than women who used OCP for a long-term. Women who used an OCP for a short-term were more likely to have poor health, not drink alcohol, smoke tobacco, have a certificate/diploma (although similar numbers with a university degree), be partnered, have experienced a violent relationship, miscarriage and termination (Significant results Table 6-3; all results [Appendix 11.5.9](#)).

Table 6-3 Significant demographic, health behaviour and health risk factors for the 1989-95 cohort OCP PBS users by long and short-term OCP use

	Long-term user 65.4%	Short-term user 34.7%
Mean age at start of period of use	22.7 years	23.1 years
Kessler psychological distress scale score	22.4	23.3
BMI	24.3	25.3
Number of children	0.1	0.1
Survey (survey which the information was taken)		
<i>1 (2013)</i>	44.1	43.5
<i>2 (2014)</i>	26.0	20.7
<i>3 (2015)</i>	13.4	11.6
<i>4 (2016)</i>	8.7	10.5
<i>5 (2017)</i>	7.7	13.7
Self-rated general health		
<i>Excellent/Good</i>	84.4	80.1
<i>Fair/poor</i>	15.4	19.9
Pattern of alcohol consumption		
<i>Low long-term risk, drinks at short-term risk less than weekly</i>	77.0	76.7
<i>Non-drinker</i>	6.7	9.3
<i>Low long-term risk, drinks at short-term risk weekly or more</i>	11.9	9.0
<i>Risky/high risk drinker</i>	3.8	3.9
Smoking status		
<i>Never smoker</i>	66.6	61.7
<i>Ex-smoker</i>	12.8	13.8
<i>Current smoker</i>	20.0	23.6
Education level		
<i>School based qualification or below</i>	41.7	37.8
<i>Certificate or Diploma</i>	28.2	33.5
<i>University degree</i>	29.9	28.4
Partnered		
<i>No</i>	73.1	67.1
<i>Yes</i>	24.9	30.4
Ever been in a violent relationship		
<i>No</i>	86.0	79.7

	Long-term user 65.4%	Short-term user 34.7%
Yes	11.8	17.9
Previous miscarriage		
No	94.9	91.5
Yes	5.1	8.5
Previous termination		
No	94.2	90.5
Yes	5.8	9.5

Note: Percentages do not add to 100 as missing data are not displayed.

In terms of the prevalence of chronic conditions, short term OCP use was associated with a higher prevalence of hypertension, low-iron, endometriosis, PCOS, depression, and anxiety relative to long-term OCP use (Figure 6-3).

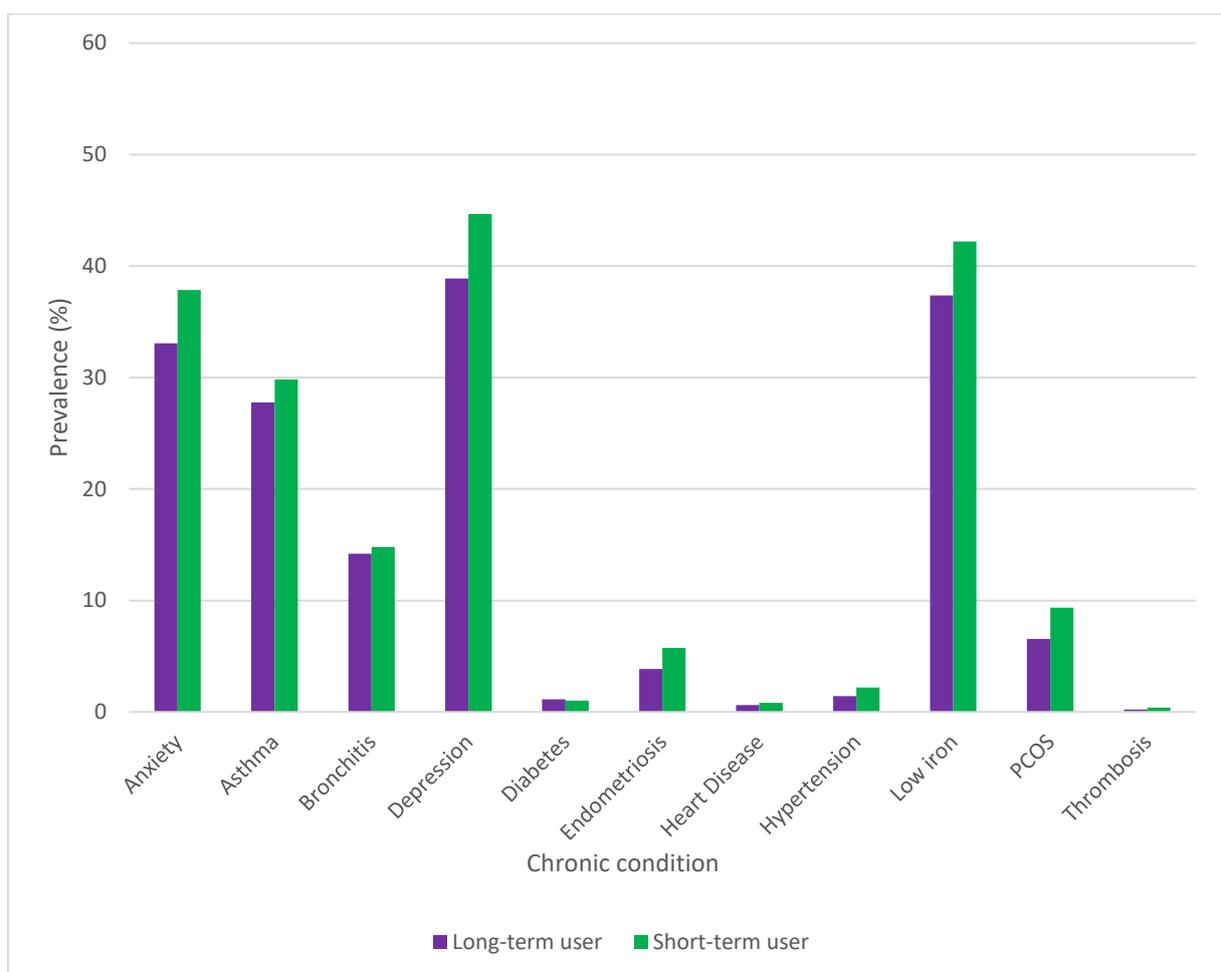


Figure 6-3 Prevalence of chronic health conditions in the 1989-95 cohort among OCP PBS long-term and short-term users.

6.6.2 1973-78 Cohort

In the 1973-78 cohort, 61.6% of women had used an OCP for a long-term, and 38.4% had used an OCP for a short-term. There were no statistically significant differences in demographic and health risk factors between women who had used an OCP for a short-term and those who used an OCP in the long-term ([Appendix 11.5.9](#)). Women who used an OCP for a short-term were more likely to commence OCP use later than women who used OCP for a long-term (Survey 8; Table 6-4).

Table 6-4 Significant factors for the 1973-78 cohort OCP PBS users by short and long-term OCP use

	Long-term user (61.6%)	Short-term user (38.4%)
Mean age at start of period of use Survey (from which the information was taken)	39.0	39.5
6 (2012)	64.6	56.1
7 (2015)	31.7	34.0
8 (2018)	3.7	10.0

Note: Percentages do not add to 100 as missing data are not displayed.

Women born 1973-78 who used an OCP for a short-term tended to have a higher prevalence of some chronic conditions, including heart disease, PCOS, and a lower prevalence of hypertension, compared to women who used an OCP long-term (Figure 6-4).

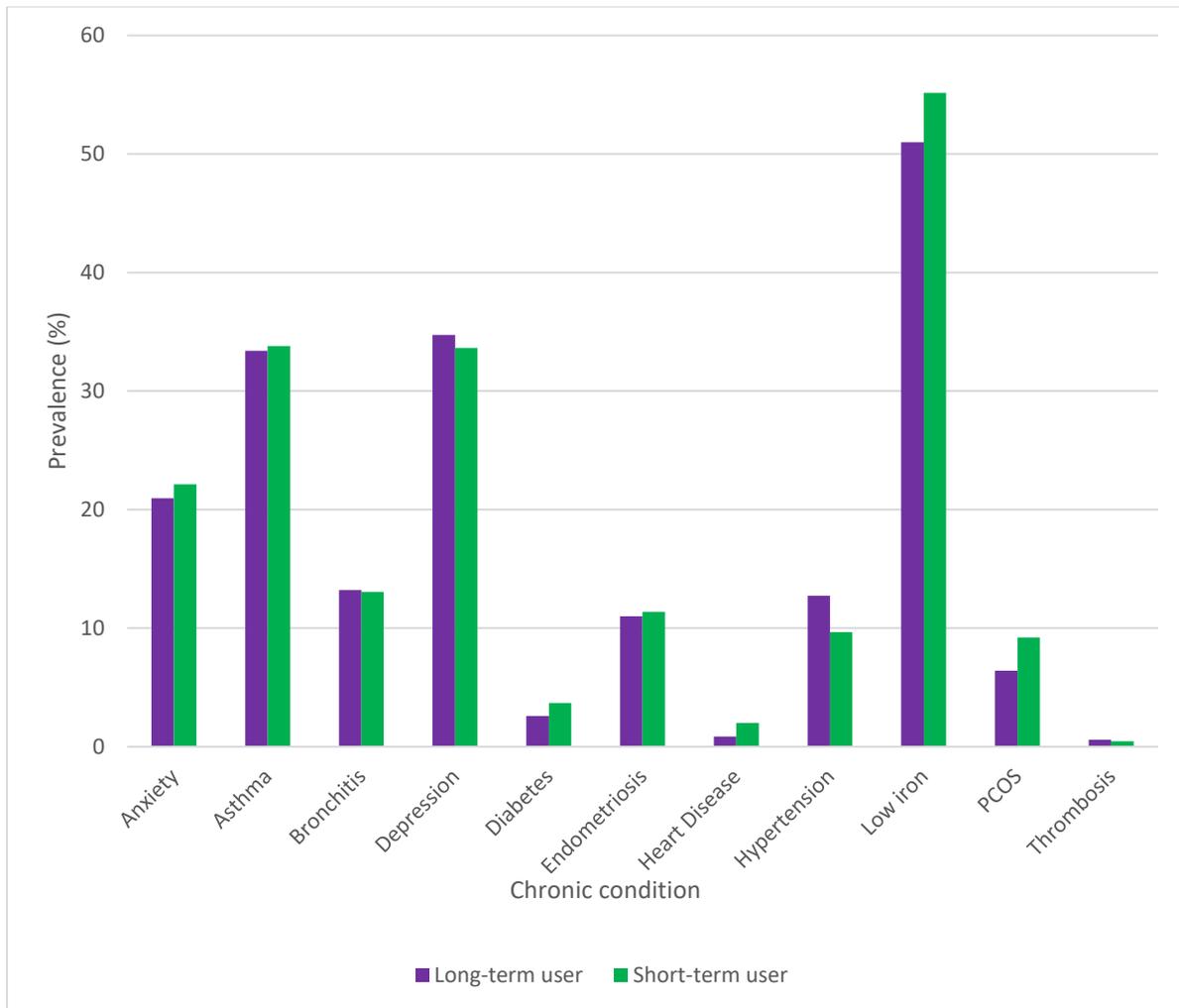


Figure 6-4 Prevalence of chronic health conditions in the 1973-78 cohort among OCP PBS long-term and short-term users.

6.7 Women who stop using the OCP

Periods of short-term OCP use identified through the PBS (as above) were common in both cohorts. In the 1989-95 cohort, there were 5,052 short-term periods of OCP use (less than 150 days) that ended prior to 30 June 2019 (when PBS data were available) across 3,730 women, and 4,340 long-term periods of OCP use across 3,756 women. Similarly, in the 1973-78 cohort, there were 1,100 short-term periods of OCP use across 862 women, and 935 long-term periods of OCP use across 802 women. Note that since women can have multiple periods of use, they can have both long- and short-term periods of use.

Data were analysed to identify which of the following events were first reported in the three years after OCP use ceased:

- Childbirth (self-reported through an ALSWH survey)
- LARC use (reported in the MBS or PBS data)
- LARC use (self-reported through an ALSWH survey)
- OCP use (reported in the PBS data)
- OCP use (self-reported through an ALSWH survey)
- None of these events

The majority of the OCP periods of use in the 1989-95 cohort were followed by a return to OCP use identified through the PBS, or by none of the events (Figure 6-5). Short-term periods of use were more likely to be followed by a return to OCP use identified through the PBS (43.3%), compared to long-term periods of use (32.1%). More than 1 in 10 periods of use were followed by LARC use (identified through MBS/PBS data) for both the long-term (11%) and short-term (11.7%) periods of OCP use. This is in addition to LARC use identified through ALSWH surveys (3.7% short-term use, 3.2% long-term use).

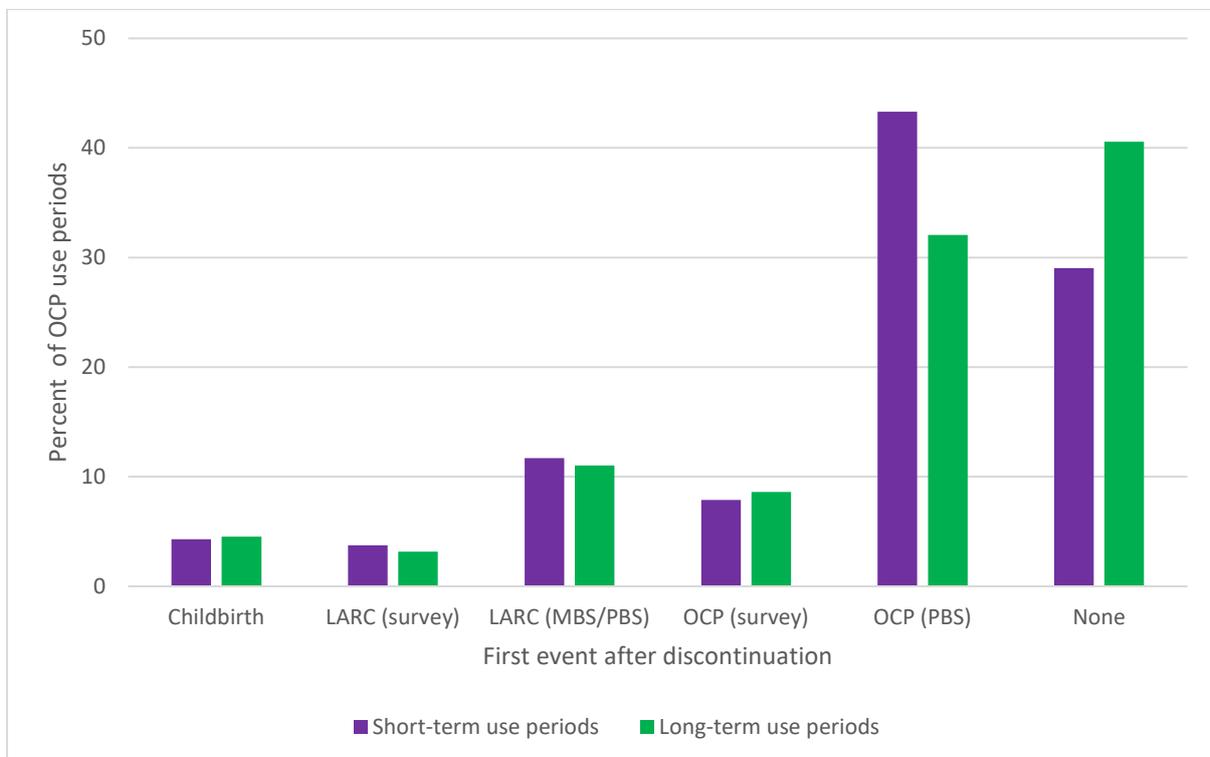


Figure 6-5 First event after discontinuation of OCP use by length of use (1989-95 cohort).

The majority of the OCP periods of use in the 1973-78 cohort were followed by a return to OCP use identified through the PBS, or none of the included events (Figure 6-6). A higher proportion of short-term use periods (37.6%) were followed by a return to OCP use identified in the PBS, compared to long-term periods of use (27.7%). Less than 10% of both the long-term and short-term OCP users had any of the four other outcomes (childbirth, LARC survey or LARC MBS/PBS, or OCP survey) as the first event.

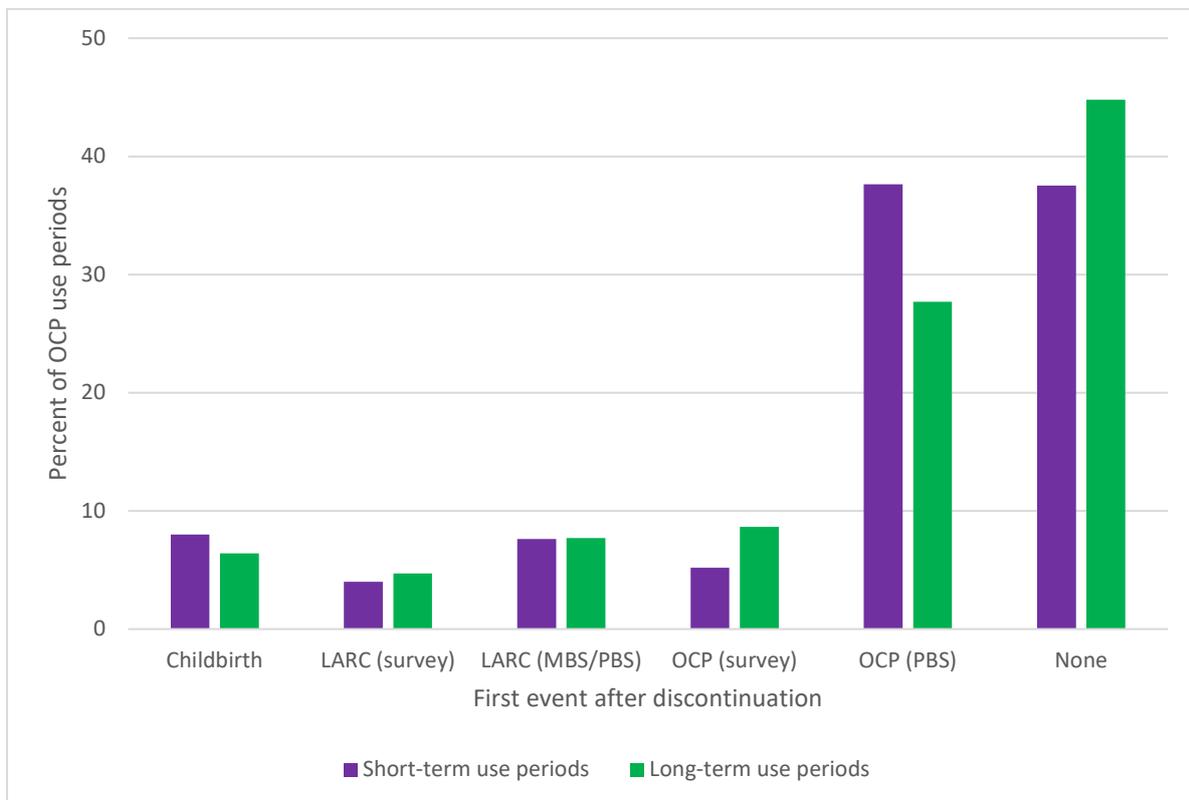


Figure 6-6 First event after discontinuation of OCP use by length of use, identified through the PBS for the 1973-78 cohort.

6.8 Factors affecting length of continual use of an OCP in long-term periods of use

We analysed the length of time from first script supply to discontinuation of OCP use for the first long-term period of OCP use (>150 days). There were 4,754 women with at least one period of long-term use in the 1989-95 cohort and 1,045 women in the 1973-78 cohort with at least one period of long-term use. Based on our definition of long-term use, women were followed from their 150th day of OCP use until discontinuation.

The median time to discontinuation of OCP use was 353 days for women in the 1989-95 cohort, and 425 days for women in the 1973-78 cohort (Table 6-5). As these estimates do not include the 150 days of use that occurred in order for them to be classified as long-term periods of use, for the women in these groups the median time is actually 503 (353+150) days for women in the 1989-95 cohort and 575 (425+150) days for women in the 1973-78 cohort.

Table 6-5 Median, 25th and 75th percentile time to OCP discontinuation for long-term users

Cohort	Median days to OCP discontinuation	25 th Percentile days to OCP discontinuation	75 th Percentile days to OCP discontinuation
1989-95	353	131	1,019
1973-78	425	164	1,133

Note: This follow-up time does NOT include the 150 days of use that defined the period of use as long-term.

In the 1989-95 cohort fully adjusted model, four factors were found to have a significant effect on the time to discontinuation of OCP use amongst long-term users (Figure 6-7). Each year increase in age at the start of the period of OCP use had a significant effect on discontinuation of OCP use (HR = 1.032 95%; CI = 1.013, 1.051), where older women were more likely to discontinue use. Each single point increase in BMI had a significant effect on time to OCP use (HR = 1.008; 95% CI = 1.002, 1.015), with higher BMI scores indicating increased likelihood of discontinuation of OCP use. Women who

were current smokers were more likely to discontinue OCP use (HR = 1.111; 95% CI = 1.009, 1.225) compared to women who had never smoked. Women who had used an illicit drug in the 12 months before survey completion were more likely to discontinue OCP use (HR = 1.116; 95% CI = 1.032, 1.207), compared to those who had not used an illicit drug in the previous 12 months. Therefore, duration of use of OCP was shorter for women in the 1989-95 cohort if they were older, had a higher BMI, smoked, or used illicit drugs.

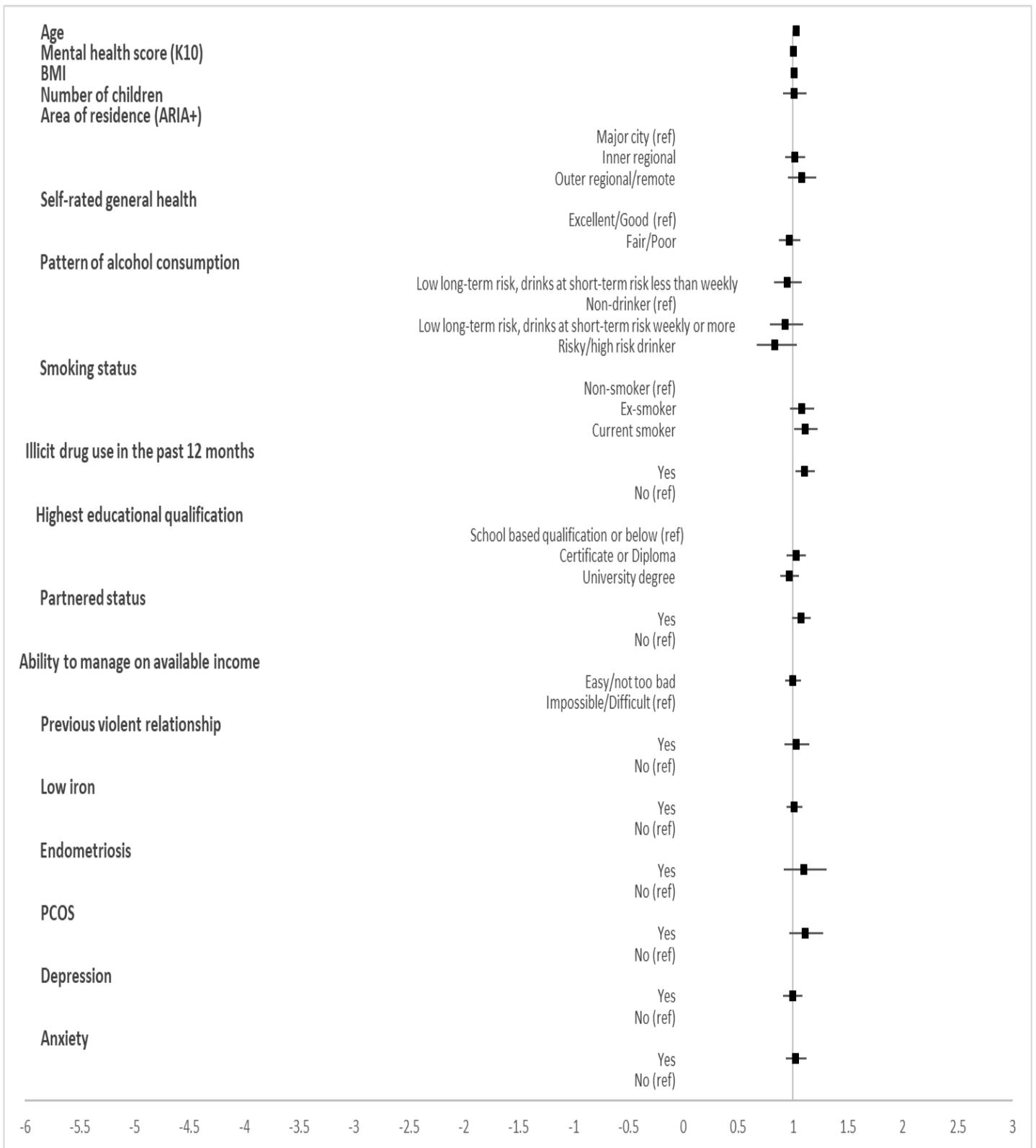


Figure 6-7 HR estimates for factors affecting time to discontinuation of OCP use for long-term OCP users in the 1989-95 cohort.

Notes: Measures were taken from the most recent survey prior to the beginning of the period of OCP use (to a maximum of 3 years). Chronic conditions were treated as enduring, based on every survey completed before beginning of OCP use, i.e. chronic conditions are taken as a “Yes” if the participant had ever reported the condition previously, else “No”.

In the 1973-78 cohort, four factors that were found to have a significant effect on the time to discontinuation of OCP use amongst long-term users (Figure 6-8). SF36 mental health scores (HR = 0.995; 95% CI = 0.99, 0.999) were found to have a small effect per unit change (note: scale is 0-100), where women with better self-reported mental health were less likely to discontinue use. Women who lived in outer regional/remote areas were less likely to discontinue OCP use (HR = 0.759; 95% CI = 0.604, 0.955), compared to women living in major cities. Women who had been in a previous violent relationship were more likely to discontinue use than women who had never been in a violent relationship (HR = 1.299; 95% CI = 1.052, 1.604). Women with endometriosis had a borderline significant increase in likelihood of discontinuation (HR = 1.242; 95% CI = 0.993, 1.555), compared to women without endometriosis. Women with PCOS were more likely to discontinue OCP use (HR = 1.362; 95% CI = 1.018, 1.823) than women without PCOS. Note the large CIs around some of the health behaviours are due to the relatively small number of women in these groups. Therefore, duration of use of OCP was shorter for women in the 1973-78 cohort if they had worse mental health, did not live in outer regional or remote areas, had been in a violent relationship, or had endometriosis or PCOS.

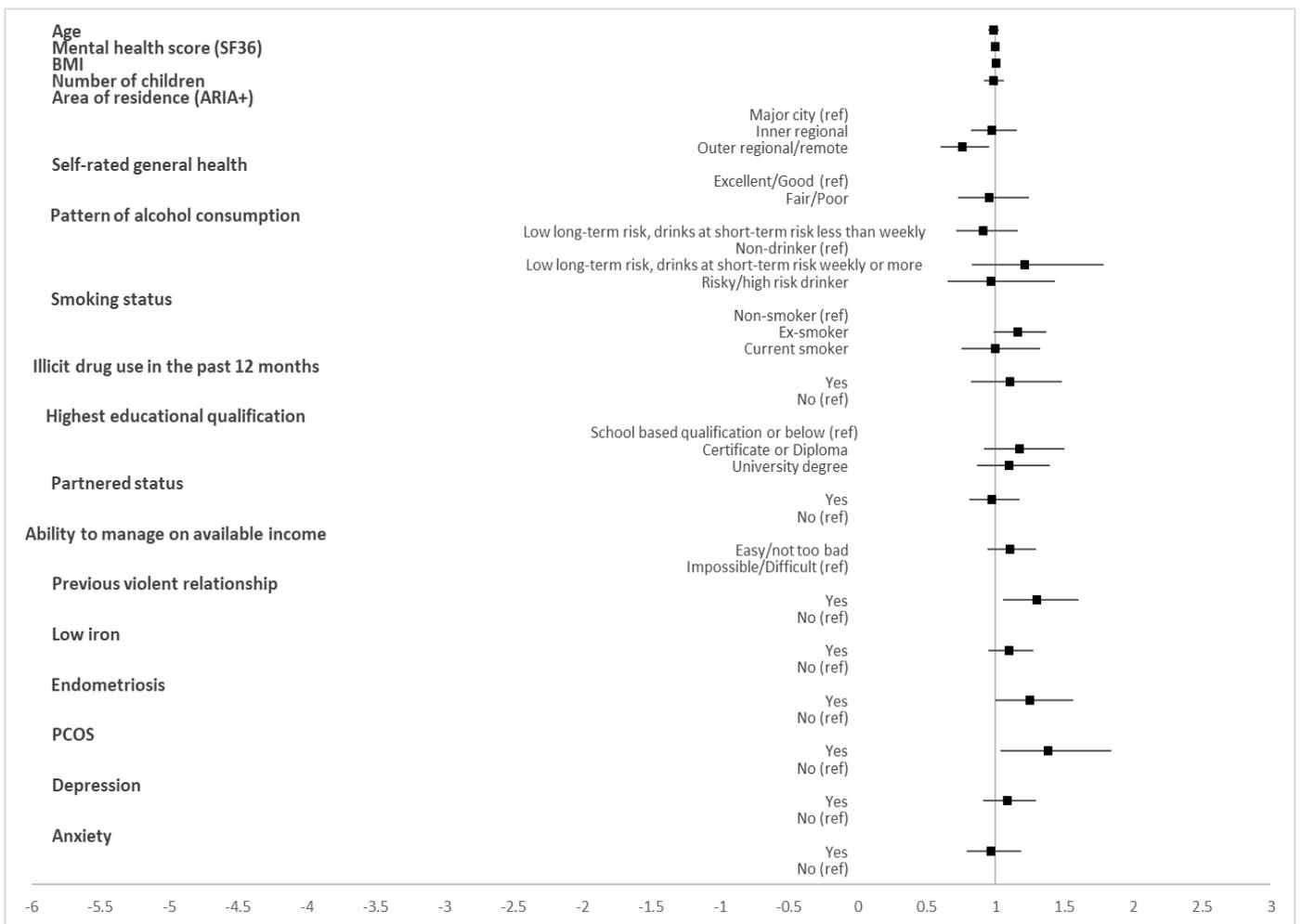


Figure 6-8 HR estimates for factors affecting time to discontinuation of OCP use for long-term OCP users in the 1973-78 cohort.

Notes: Measures were taken from the most recent survey prior to the beginning of the period of OCP use (to a maximum of 3 years). Chronic conditions were treated as enduring, based on every survey completed before beginning of OCP use, i.e. chronic conditions are taken as a “Yes” if the participant had ever reported the condition previously, else “No”.

6.9 Discussion

This chapter has examined the duration of use of the OCP as ascertained through the PBS data. Many of the periods of use equated to one script. However, when we assessed selected reproductive events that occurred after these short periods, most women returned to the OCP. Longer periods of use had a mean duration of around 500-575 days (around 1.5 years), with few factors associated with how long women remained on the OCP. The factors that were identified suggest that poor health and health risks may be associated with stopping OCP earlier, including smoking and higher BMI, use of illicit drugs, being in a violent relationship, having endometriosis or PCOS. In the 1989-95 cohort, women had shorter durations of OCP use if they were older when the period of OCP use commenced. This effect may be consistent with women going off the pill to start a family.

We note that not all women who use the OCP are represented in this chapter, as not all OCPs are listed on PBS. We estimate that upwards of 30% of women who reported OCP use on the survey were not having their prescription supplied through the PBS. However, comparisons of ALSWH data for women reporting OCP use according to whether they were identified in PBS or not revealed few differences, except that PBS OCP data may slightly over-represent women who have more children and more socio-economic disadvantage. Despite this limitation, analysis of PBS data for OCP has a great advantage in providing information on duration of use of this form of contraception for a majority of women.

6.10 References

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7. PATTERNS OF PREGNANCY AND ART

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7.1 Key points

Reproductive outcomes

- Among women born 1989-95 (aged up to 30 years) who completed one of the two most recent surveys (N = 10,103), 14% have reported giving birth, 7% have reported a miscarriage, and the average birth rate was 1.5.
- Among women born 1973-78 (aged up to 45 years) who completed one of the two most recent surveys (N = 8,149), 81% have reported giving birth, 36% have reported a miscarriage, and the average birth rate was 2.3.

Reproductive health problems

- Among women in the 1989-95 cohort who had completed one of the two most recent surveys, 10% reported endometriosis and 15% reported PCOS.
- Among women in the 1973-78 cohort who had completed one of the two most recent surveys, 12% reported endometriosis and 9% reported PCOS.

Pregnancy intentions

- At the most recent survey when aged 24-30 years, one in ten women from the 1989-95 cohort reported that they were pregnant or trying to conceive.
- Among women from the 1973-78 cohort, one in five women reported that they were pregnant or trying to conceive when aged 28-33 years (Survey 4), compared to 4% when aged 40-45 years at Survey 8 (2018)
- Women who were pregnant reported better health behaviours (higher fruit consumption, less likely to have a BMI in the obese range, smoked less) than those who were not pregnant. However, there was no difference in health behaviours between women who were trying to conceive and those who were not trying to conceive.

- Women who were trying to conceive had the highest prevalence of reproductive health problems including endometriosis (1973-78 cohort) and PCOS (1989-95 and 1973-78 cohorts), compared to those who were pregnant or not trying to conceive.

Fertility issues

- At age 24-30, 6% of women born 1989-95 reported fertility issues.
- For women born 1973-78, fertility issues increased from 4% at 22-27 years to 24% at 40-45 years. One in three women who completed one of the two most recent surveys reported fertility issues at some point, and 76% of these had sought help for fertility issues.
- The prevalence of fertility issues was similar at equivalent ages for women born 1989-95 and 1973-78, however, seeking help was more common in the 1973-78 cohort.

ART

- MBS data indicated 7,137 treatment cycles for 1,537 women (215 from the 1989-95 cohort and 1,322 from the 1973-78 cohort).
- For those women who have accessed ART so far, the number of cycles ranged from 1 to 36 cycles, with an average of 4.6 cycles per woman. Most women (72%) had accessed IVF only, rather than intra-uterine IUI.
- Women born 1989-95 who engaged with ART services early in their reproductive life (aged 17-24) were less likely to have a partner compared to women who engaged ART services later in life.
- Women born 1973-78 who engaged with ART services late in their reproductive life (aged 40-45) were less likely to have a partner than women who engaged ART services earlier in life.
- Women who engaged with ART services late in their reproductive life (aged 40-45; 1973-78 cohort) tended to report that they had not given birth by 40-45 years.
- Overall, the 1989-95 cohort started ART sooner and used it at higher rates when compared to the 1973-78 cohort.

- The prevalence of reproductive health problems was high among women accessing ART services, with 25% of women born 1989-95 and 1973-78 reporting endometriosis, 20% of women born 1973-78 reporting PCOS, and 42% of women born 1989-95 reporting PCOS. Slightly more women with endometriosis used both IVF and IUI, and more women with PCOS used IUI.
- Women who undertook a higher number of ART cycles tended to have endometriosis, had not given birth prior to starting ART treatment, and reported one rather than two or more births across all surveys (note that births cannot be tied to ART).

7.2 Introduction

Using data collected from 34,247 women (10,363 of whom were mothers) and 21,924 births, this chapter reports:

- the prevalence of reproductive outcomes (e.g., births, miscarriages);
- the prevalence of reproductive conditions (endometriosis and PCOS);
- pregnancy intentions, including the demographic and health characteristics of women trying to conceive;
- fertility problems and help-seeking; and
- the use of ART by demographic characteristics, age, type of treatment and number of cycles. Details of how cycles were calculated from MBS data are available in [Appendix 11.6](#)

This chapter focuses on two cohorts of the ALSWH. Women born 1989-95 were surveyed annually from Survey 1 in 2012-13 until Survey 5 in 2017, with the sixth survey deployed in 2019, covering ages 18-30 years. Women born 1973-78 were surveyed in 1996, 2000 and subsequently every three years since then, with the eight surveys covering ages 18-45 years.

7.3 Reproductive outcomes: Births, stillbirths, deaths, and miscarriages

This section focuses on births reported by the 1989-95 and 1973-78 cohorts. It includes surviving children, stillbirths, deaths, miscarriages and maternal age at first

birth. We have focused on women who have provided details about all of their births in at least one of the two most recent surveys. This approach captures the most current reproductive information for both cohorts, providing a sample of 10,103 women from the 1989-95 cohort and 8,149 women from the 1973-78 cohort.

7.3.1 Current status of reproductive outcomes in the cohorts

Of the 10,103 women from the 1989-95 cohort, 1,460 women (14.4%) have reported 2,251 births so far. Of these births, 26 were stillborn, 8 infants died, and 2,217 were surviving livebirths. On average, these women have had 1.5 live births (SD = 0.8), with a maximum of six livebirths reported to date. Miscarriages were reported by 696 women (6.9%), with the majority of these women (N = 517; 74.5%) reporting one miscarriage and the remaining women (N = 179; 25.7%) reporting two or more miscarriages. The average age at first birth was 23.2 years old (SD = 3.5).

Of the 8,149 women from the 1973-78 cohort, 6,594 women (80.9%) have reported 15,043 births. Of these births, 120 infants were stillborn, 51 infants died, and 14,872 were surviving live births. The average number of live births per woman was 2.3 (SD = 0.9) with a maximum of nine live births reported per woman. Miscarriages were reported by 2,968 (36.4%) women, with the majority of these women (N = 1,839; 62.0%) reporting one miscarriage and the remaining 1,129 women (38.0%) reporting two or more miscarriages. The average age at first birth (Figure 7-1) was 29.6 years (SD = 5.3).

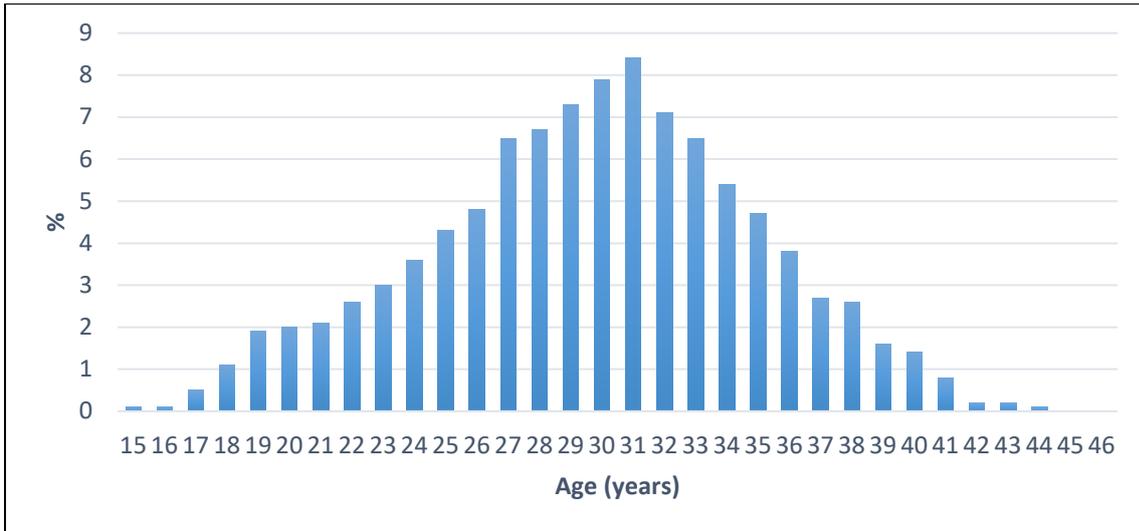


Figure 7-1 Maternal age at first birth (1973-78 cohort).

7.3.2 A comparison of reproductive outcomes between cohorts

The 1989-95 and 1973-78 cohorts are at different stages of their reproductive lives. Comparing the two cohorts at equivalent ages provides insight into generational differences in birth patterns.

More births were reported by women in the 1973-78 cohort than those in the 1989-95 cohort. By age 30, the average number of births per woman was higher in the 1973-78 cohort (1.8 births on average, SD = 0.8) than the 1989-95 cohort (1.5 births on average, SD = 0.7). However, the majority of the 1989-95 cohort have not yet reached 30 years and so this figure is likely to change. At 18-23 years, a higher percentage of women born 1973-78 reported giving birth than women born 1989-95. Results were similar when women were aged 22-27 years (Figure 7-2).

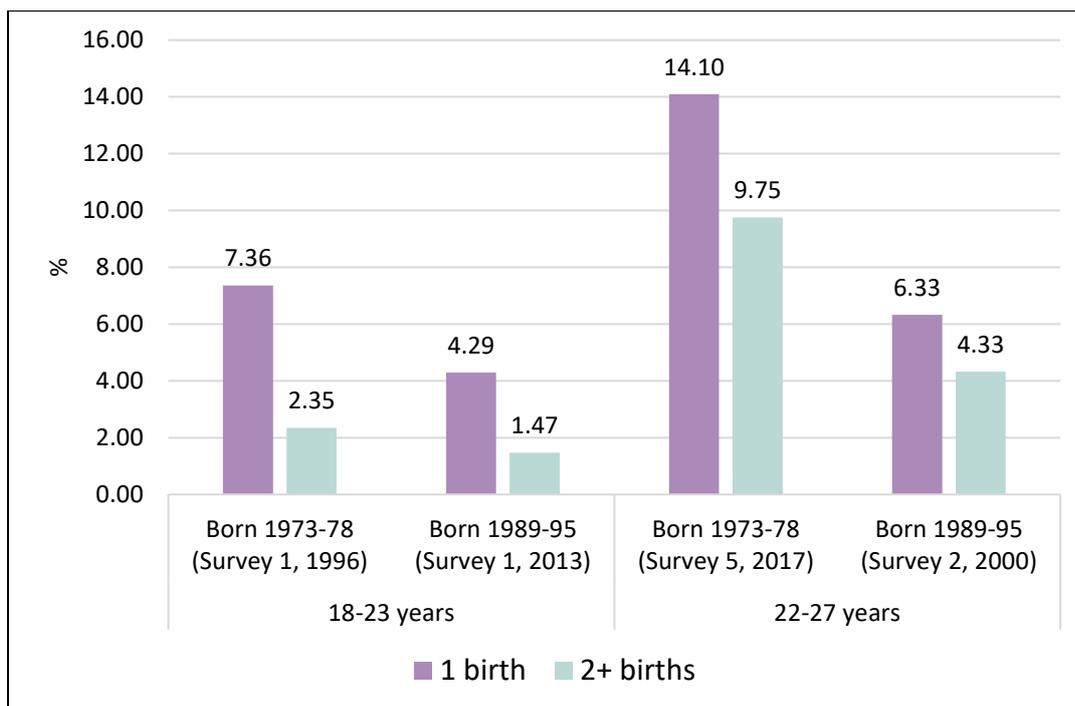


Figure 7-2 Births in the 1973-78 and 1989-95 cohorts at equivalent ages.

7.4 Reproductive conditions: Endometriosis and PCOS

This section covers two key reproductive conditions which can impact fertility, namely endometriosis and PCOS. Endometriosis is a condition in which endometrial tissue grows outside the uterus. PCOS is a complex hormonal condition which is characterised by hormonal imbalances that can induce irregular menstrual periods, excessive facial and body hair growth, acne, obesity, diabetes and trouble with fertility.

7.4.1 Current status of reproductive conditions in the cohorts

Of the 10,103 women from the 1989-95 cohort who completed at least one of the two most recent surveys, 9.8% (N = 985) have reported endometriosis so far and 14.8% (N = 1,493) have reported PCOS.

Of the 8,149 women from the 1973-78 cohort who completed at least one of the two most recent surveys, 12.2% (N = 991) have reported endometriosis and 9.2% (N = 753) have reported PCOS.

7.4.2 Previous ALSWH research: Endometriosis

Endometriosis is a significant public health issue, with 34,200 hospitalisations across Australia in 2016-17 related to endometriosis and a National Action Plan for Endometriosis launched in 2018 (AIHW, 2020). However, the diagnostic process can be lengthy, taking up to 12 years, and the prevalence in Australia has been uncertain.

Recently, the ALSWH team used four sources of data to estimate the prevalence of endometriosis in the 1973-78 cohort (Rowlands et al., 2020). These were: 1) self-report survey data; 2) MBS data; 3) PBS data; and 4) Admitted Patient Data Collections (hospital data). Overall, 11% of women received a diagnosis of endometriosis, with 6% clinically confirmed through hospital data and 5% clinically indicated through MBS, PBS and/or self-report data. Incidence of endometriosis (i.e., first diagnosis/report) peaked between 30-34 years.

Compared with women without endometriosis, women with endometriosis were more likely to report use of complementary or alternative therapies and products, including massage therapist, acupuncturist, naturopath/herbalist, vitamins/minerals, yoga/meditation, herbal medicines and Chinese medicine (Fisher et al., 2018; Yang et al., 2017). Approximately 60% of women with a diagnosis of endometriosis reported moderate to severe psychological distress (compared with approximately 47% of women without endometriosis) (Rowlands et al., 2016).

7.4.3 Previous ALSWH research: PCOS

Between 2013 and 2020, 14 papers were published on PCOS using ALSWH data. Overall, women with PCOS had poorer physical, mental and reproductive health than women without PCOS. They also reported less optimal health behaviours, with more sleep disturbance (Mo et al., 2019), higher BMI (Moran et al., 2017; Moran et al., 2013), more sitting time (Moran et al., 2013; Tay et al., 2020) and lower physical activity (Tay et al., 2020), although diet quality was better in women with PCOS than in women without PCOS (Moran et al., 2017). Women with PCOS had a 15-fold increase in the odds of infertility, independent of BMI, than women without PCOS (Joham et al., 2015).

Table 7-1 Physical, mental and reproductive health of women born 1973-78 with and without PCOS

	Reported PCOS	No reported PCOS
	%	%
Physical health		
Asthma ^{1,2}	15.2	10.6
Hypertension ³	5.5	2.0
Type II diabetes ^{4,5}	5.1	0.3
Mental health		
Depression ⁶	27.3	18.8
Anxiety ⁶	50.0	39.2
Low self-esteem ⁷	31.7	24.2
Psychological distress ¹¹	21.0	13.5
Eating disorder ⁷	11.0	7.6
Reproductive health		
Contraception use ⁸	61.0	79.0
Trying to conceive ⁸	56.0	45.0
Infertility ⁹	72.5	16.4
Gestational diabetes ⁵	11.2	3.5
Antenatal depression ¹⁰	8.9	4.4
Antenatal anxiety ¹⁰	11.7	5.6
Postnatal depression ¹⁰	26.8	18.6
Postnatal anxiety ¹⁰	18.4	12.0

¹Grieger et al., 2020; ²Htet et al., 2017; ³Joham et al., 2015b; ⁴Kakoly et al., 2019; ⁵Joham et al., 2014a; ⁶Danane et al., 2019; ⁷Tay et al., 2019; ⁸Joham et al., 2014b; ⁹Joham et al., 2015a; ¹⁰Chau et al., 2019; ¹¹Rowlands et al., 2016.

7.5 Pregnancy intentions

This section explores the demographic and lifestyle characteristics of women who reported they were trying to conceive, and their reproductive health problems. A comparison between women who were trying to conceive with women who were pregnant or not trying to conceive was undertaken.

7.5.1 Pregnancy intentions of women in the 1989-95 cohort

When aged 22-27 years in 2017, around one in 14 women (7%) were either pregnant or trying to become pregnant. Two years later, when aged 24-30 years, one in ten women (10%) reported that they were pregnant or trying to conceive (Table 7-2).

Table 7-2 Pregnancy intentions in the 1989-95 cohort in 2017 and 2019

Pregnancy intentions	Aged 22-27 years Survey 5 (2017) (N = 8,495)	Aged 24-30 years Survey 6 (2019) (N = 8,346)
	N (%)	N (%)
Pregnant	232 (2.7)	361 (4.4)
Trying to conceive	360 (4.3)	442 (5.4)
Not trying	7,845 (93.0)	7,388 (90.2)

When aged 24-30 years in 2019, women who were pregnant were more likely to live in a major city or live with a partner, and less likely to report difficulty managing on their available income than women who were not pregnant (either trying or not trying to get pregnant; **Figure 7-3**). Women who were trying to conceive were similar to those who were pregnant. A higher percentage of women with a university education were not trying to conceive (67.8%) compared with those who were trying to conceive or who were pregnant (52.9% and 58.7% respectively).

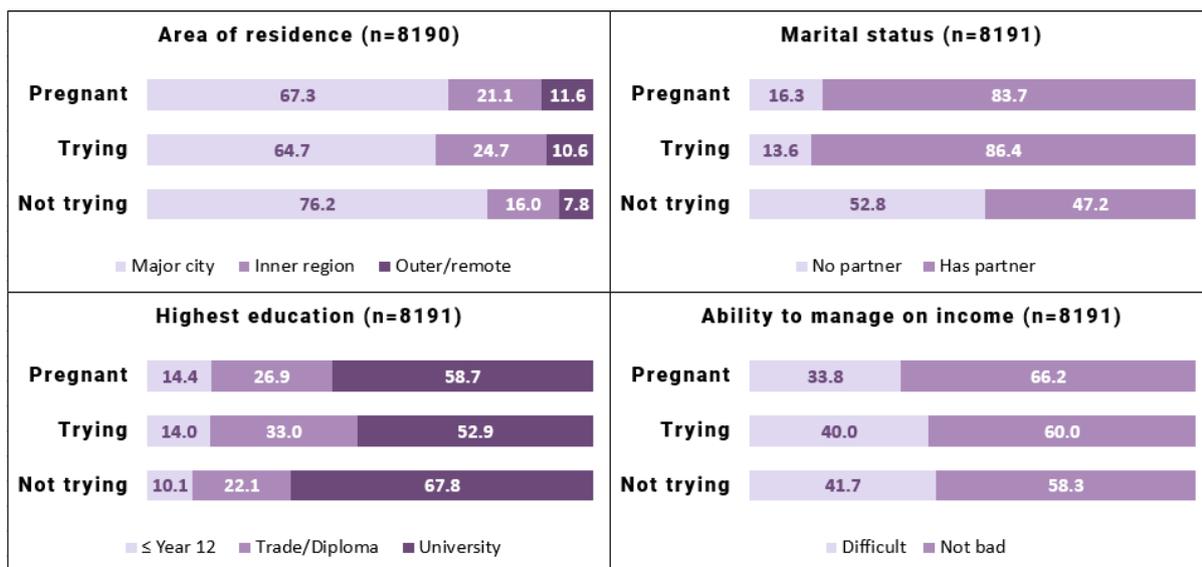


Figure 7-3 Key differences in demographic characteristics by pregnancy status for women born 1989-95 at Survey 6 (2019).

When aged 24-30 years in 2019, pregnant women reported the highest fruit consumption, lowest levels of obesity, and had the highest percentage of ex-smokers (Figure 7-4). Women trying to conceive were more likely to have a BMI in the obese range and less likely to smoke, compared to those not trying to conceive. Consumption of fruit and vegetables per day was similar for both groups.

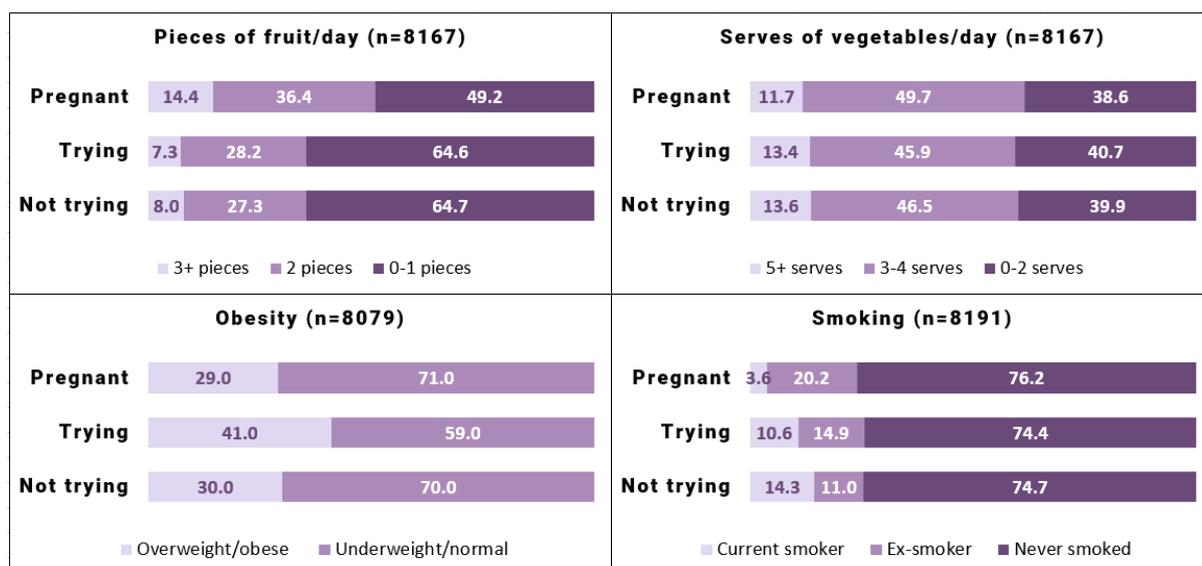


Figure 7-4 Key differences in lifestyle behaviours by pregnancy status among women born 1989-95 at Survey 6 (2019).

When aged 24-30 years in 2019, women trying to conceive reported the highest prevalence of PCOS (Figure 7-5). The prevalence of endometriosis was similar for women who were pregnant and those who were trying to conceive, and both of these groups were slightly more likely to report endometriosis than women not trying to conceive.

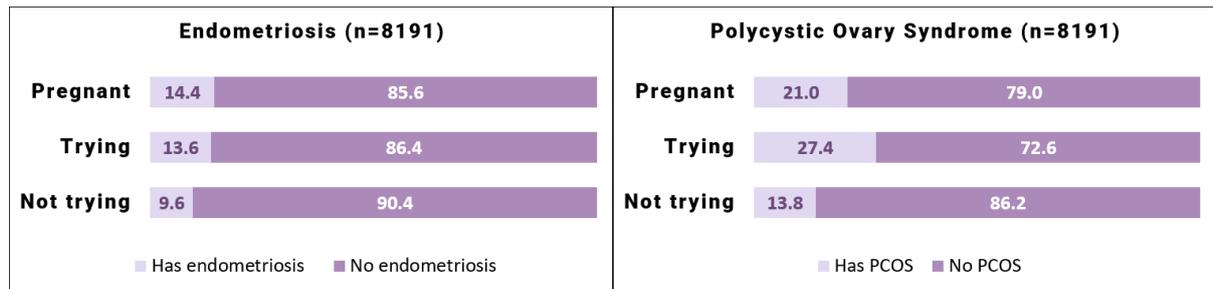


Figure 7-5 Key differences in reproductive health problems by pregnancy status among women born 1989-95 at Survey 6 (2019).

7.5.2 Pregnancy intentions of women in the 1973-78 cohort

Between 28-36 years (Surveys 4-5), one in five women reported that they were pregnant or trying to conceive (Figure 7-6). This decreased over time, with almost all women aged 40-45 years (Survey 8) reporting that they were not pregnant nor trying to conceive.

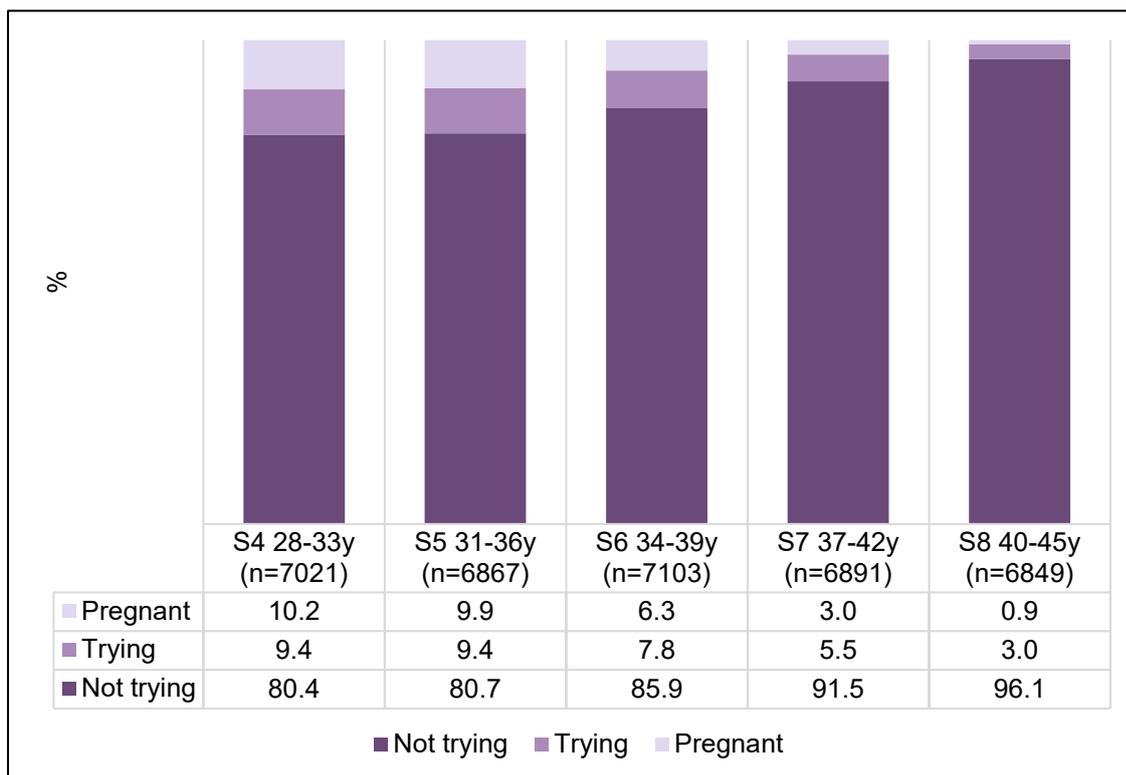


Figure 7-6 Pregnancy intentions at each survey (1973-78 cohort).

When aged 37-42 years (2015; Survey 7), women who were pregnant were more likely to live in a major city or live with a partner, and less likely to report difficulty managing on available income than women who were not pregnant (Figure 7-7). Women trying to conceive were the most likely to report dissatisfaction with what they had achieved with regard to motherhood/children.

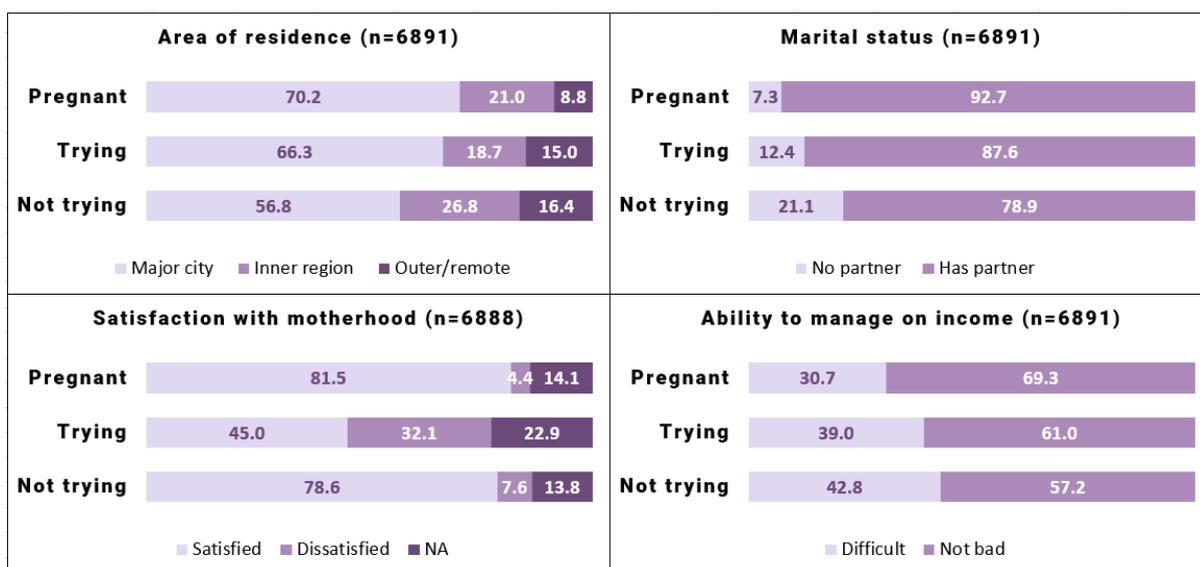


Figure 7-7 Key differences in demographic characteristics by pregnancy status among women born 1973-78 at Survey 7 (2015).

When aged 37-42 years in 2015, pregnant women had the highest fruit consumption, the lowest percentage of women with obesity and the highest percentage of ex-smokers, compared with women who were not pregnant (Figure 7-8). There were no apparent differences between women trying and not trying to conceive on any lifestyle behaviour. There were also no substantial differences between any of the groups on vegetable consumption.

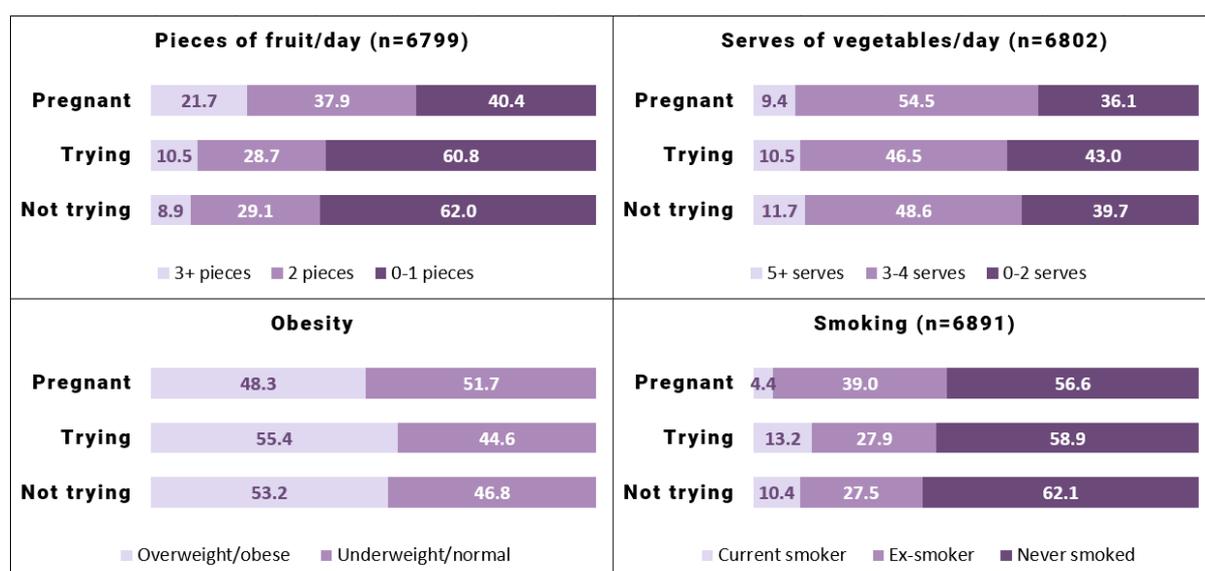


Figure 7-8 Key differences in lifestyle behaviours by pregnancy status among women born 1973-78 at Survey 7 (2015).

When aged 37-42 years in 2015, women trying to conceive reported the highest prevalence of endometriosis and PCOS, with the prevalence almost double that of women who were pregnant or not trying to conceive (Figure 7-9).

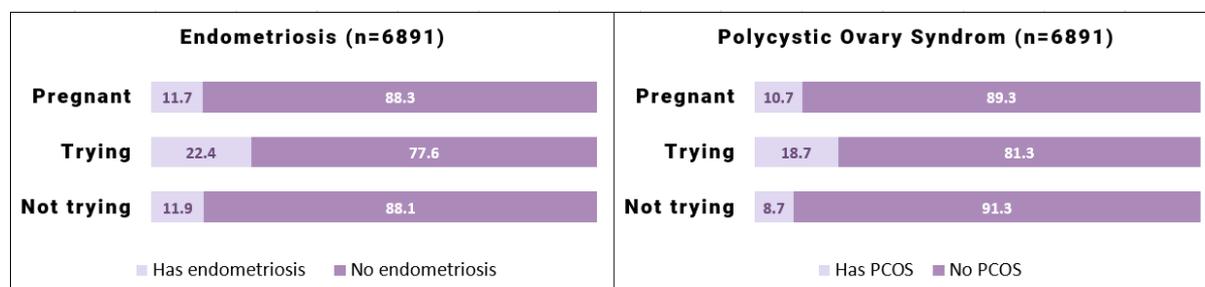


Figure 7-9 Key differences in reproductive health problems by pregnancy status among women born 1973-78 at Survey 7 (2015).

7.5.3 Previous ALSWH research

Two previous studies have investigated pregnancy intentions using ALSWH data. One examined the associations between lifestyle and psychological factors and trying to conceive, using data from the 1973-78 cohort (Hill et al., 2019). At age 25-30 years (Survey 3), women who were older, had fewer children, were partnered and had a BMI in the obese range were more likely to report trying to conceive. Women who had a degree, were in paid work and who drank alcohol were less likely to report trying to conceive. Women who aspired to have a first child were more likely to be younger, partnered, earning at least \$78,000 per year and drink alcohol, and those aspiring to have another child were more likely to be partnered and have higher stress but lower anxiety. At age 31-36 years (Survey 5), women who had fewer children and who were partnered were more likely to report trying to conceive. There was no association between physical activity/sedentary behaviour and diet, suggesting that women trying to conceive did not change their health behaviours, with the exception of abstaining from alcohol.

The second study investigated the use of complementary therapies in the context of women trying to conceive. Although there were no differences in some lifestyle behaviours, use of complementary therapies was higher among women trying to

conceive (Steel et al., 2017). When aged 28-39 years (Surveys 4-6), women trying to conceive were more likely to see an acupuncturist and a naturopath/herbalist, but not a chiropractor or osteopath. This study also found a higher prevalence of endometriosis and PCOS in women trying to conceive.

7.6 Fertility issues and seeking treatment

This section explores the prevalence of fertility issues and whether or not women sought help for fertility problems. Fertility issues are defined as occurring when women are unable to fall pregnant after 12 months of regular unprotected intercourse. The self-reported use of IVF, ovulation induction, and use of fertility hormones in the 1973-78 cohort is also explored. ART is analysed in detail using MBS data in [Section 7.7](#).

7.6.1 Fertility issues among women in the 1989-95 cohort

Women in the 1989-95 cohort were asked about their fertility at Survey 5 (aged 22-27) and again at Survey 6 (aged 24-30). The percentage of women reporting fertility issues increased from 4% when women were aged 22-27 years to 6% when women were aged 24-30 years (Table 7-3).

Table 7-3 Prevalence of fertility issues in the 1989-95 cohort, reported in 2017 and 2019

Fertility issues	Aged 22-27 years	Aged 24-30 years
	Survey 5 (2017)	Survey 6 (2019)
	N (%)	N (%)
Never tried to get pregnant	7,285 (86.4)	6,179 (78.6)
No problems with fertility	836 (9.9)	1,228 (15.6)
Had problems with fertility	312 (3.7)	450 (5.7)
Had not sought help ^a	153 (49.0)	166 (36.9)
Sought help ^a	159 (51.0)	284 (63.1)

^a percent is calculated from those who reported problems while trying to become pregnant

7.6.2 Fertility issues among women in the 1973-78 cohort

In the 1973-78 cohort, the percentage of women reporting that they had never tried to conceive reduced substantially over time, from 75% when women were aged 22-27 years to 17% when women were aged 40-45 years (Figure 7-10). While the majority of women reported no problems trying to conceive, the percentage ever reporting problems trying to conceive increased over time, from 3.5% when women were aged 22-27 years, to 24.2% when women were aged 40-45 years (Figure 7-10).

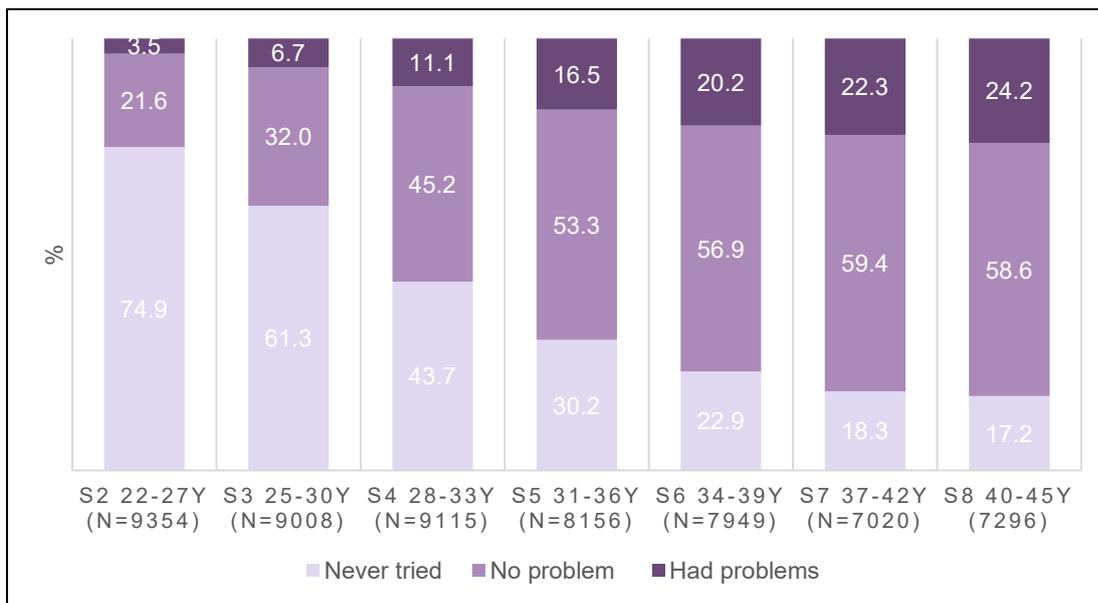


Figure 7-10 Fertility problems among the cohort born 1973-78 from Survey 2 to 8 (from 2000 to 2018).

Incidence (first reports) of fertility problems among women born 1973-78 are shown in Figure 7-11. Women as young as 22-27 years reported fertility problems. Incidence peaked when women were aged 31-36 years.

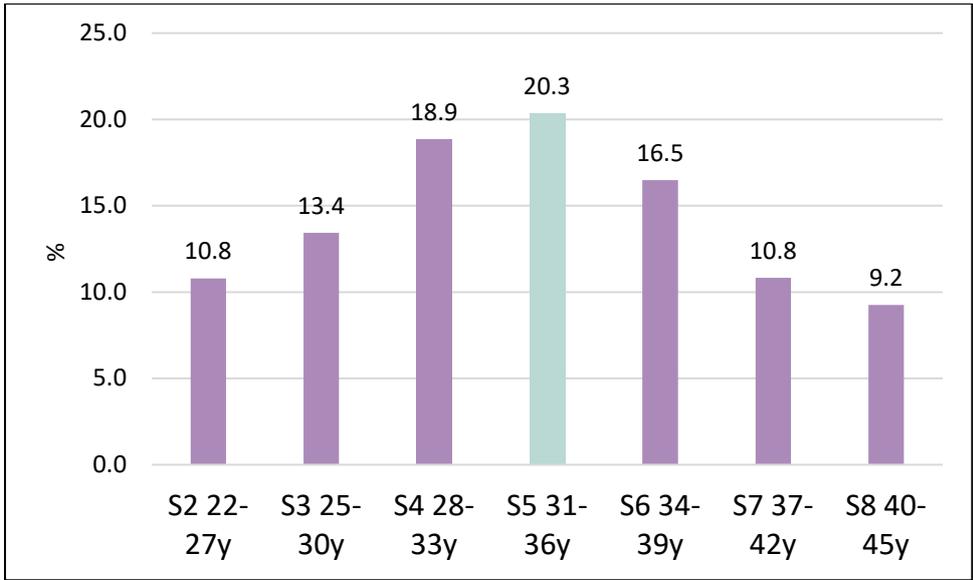


Figure 7-11 Incidence of fertility problems for women born 1973-78 from Survey 2 to Survey 8 (from 2000 to 2018).

Note: Peak incidence is highlighted in green.

Among women who did report fertility issues while trying to conceive, the percentage seeking help increased over time, from 56% when women were aged 22-27 years, to 79% when women were aged 40-45 years (Figure 7-12).

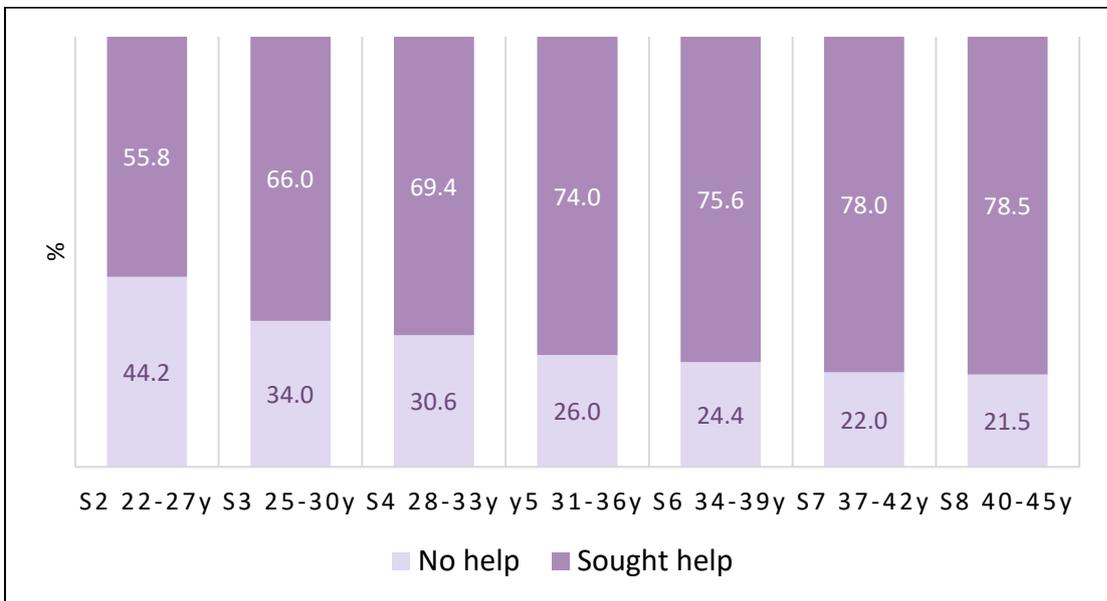


Figure 7-12 Help-seeking among women with fertility problems in the 1973-78 cohort, from Survey 2 to Survey 8 (from 2000 to 2018).

Almost three in five women (57%) who sought help for fertility problems reported using IVF and/or fertility hormones when aged 28-45 years (Figure 7-13). The remaining women (43%) who sought help did not report using either of these treatments.

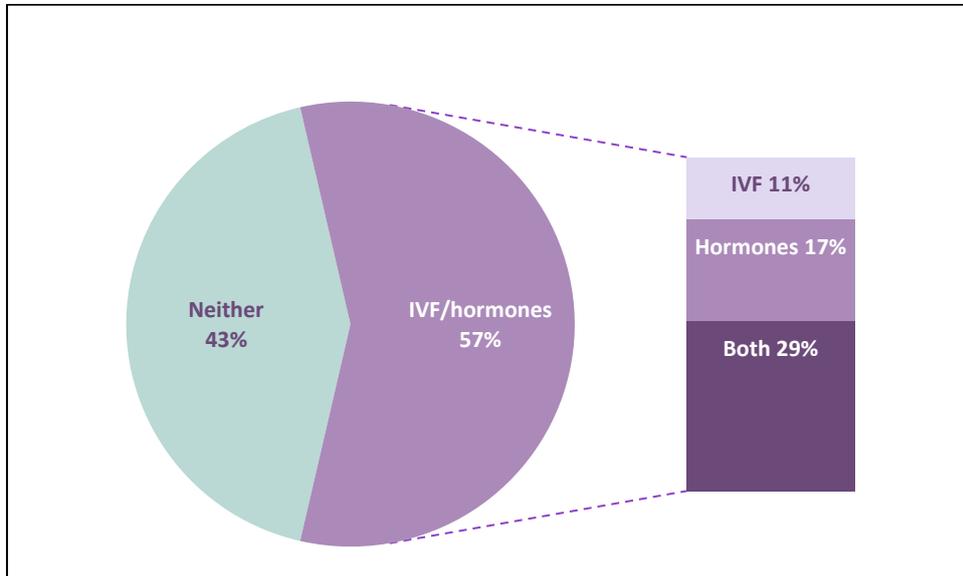


Figure 7-13 Use of IVF and/or fertility hormones among women born 1973-78 who sought help for fertility problems.

7.6.3 Previous ALSWH research concerning fertility issues

Previous studies have investigated fertility issues using ALSWH data from the 1973-78 cohort. Herbert et al. (2010) investigated medical conditions and symptoms among women with fertility problems. When aged 28-33 years (Survey 4), women with fertility issues (17.3%) were more likely to have depression, endometriosis, PCOS, irregular periods, type II diabetes and gestational diabetes, but were less likely to have heart disease, low iron, haemorrhoids or leaking urine. Women who had not sought treatment for their fertility issues (23.8%) were more likely to have depression or other mental health problems, urinary tract infections, heavy periods, and previous cancer, and less likely to have endometriosis, PCOS, gestational diabetes and headaches.

The second study investigated the types of treatment sought for fertility issues (Herbert et al., 2009). Findings indicated that women who had endometriosis or PCOS were more likely to seek advice than those without these conditions. Pregnancy termination, obesity, and smoking daily were associated with a decreased likelihood of seeking

help for fertility issues. Of women who sought advice, 50% reported using hormonal or IVF treatment. The remaining study reported on birth outcomes among women who sought treatment for fertility problems (Herbert et al., 2012). When aged 28-36 years (Surveys 4 and 5), 54% of women who reported use of IVF or ovulation induction reported a recent birth, compared with 44% of women who did not use IVF or ovulation induction.

7.7 ART

This section explores the use of ART using MBS data linked with ALSWH survey data. Overall use of ART is first reported, with the following sections reporting the use of ART according to demographic characteristics, age, treatment types and number of cycles.

7.7.1 MBS items for ART

There are 11 MBS items for ART (Table 7-4). Some of these are used for IVF and some for IUI. Different code combinations are applied for different types of cycles, and there is a great deal of inconsistency in how codes are applied. See [Appendix 11.6](#) for more details of how cycles were calculated.

Table 7-4 MBS item numbers for ART

Item number	Description
13200, 13201	Superovulated treatment cycle proceeding to oocyte retrieval (IVF)
13202	Superovulated treatment cycle cancelled prior to oocyte retrieval (IVF)
13203	Ovulation monitoring for artificial insemination (IUI)
13206	Natural treatment cycle (IVF)
13209	Planning and management of IVF or IUI
13212	Oocyte retrieval (IVF)
13215	Transfer of embryos, or both ova and sperm, to the uterus or fallopian tubes (IVF)
13218	Preparation of frozen or donated embryos, or donated oocytes, for transfer to uterus or fallopian tubes (IVF)
13221	Preparation of semen for artificial insemination (IUI)
13251	ICSI (IVF)

There were more than 24,000 item numbers for ART in the linked ALSWH-MBS dataset, which included data from 1996 to 2020 (Table 7-5). These made up just over 7,000 ART cycles for 1,537 women (1989-95 cohort: N = 215, 14.0%; 1973-78 cohort: N = 1,322, 86.0%). Note that women in the 1989-95 cohort are only aged up to 30 years and have not yet reached the peak years of expected ART use. We have reported the data we have to date, but the use of ART by this cohort is expected to increase in coming years.

On average, women completed 4.6 cycles (SD = 4.2, median = 3). However, there was a great deal of variation, with the number of ART cycles per woman ranging from 1 to 36. Average time on ART treatment was two years (SD = 2.6) but ranged from less than 1 year to 18 years. The majority (84%) of cycles were IVF, and almost 1 in 5 women (18.5%) used both IUI and IVF (Table 7-5).

The total MBS benefit paid over the study period was almost \$19 million (Table 7-5). The average total benefit paid per woman was \$12,296 (SD = \$12,004), but ranged from \$35 to \$87,932. In total, women were out of pocket by \$11.5 million. The average out-of-pocket expense was \$7,535 per woman (SD = \$7,927) but ranged from \$0 to \$59,378.

Table 7-5 Summary of MBS data and costs for ART for both the 1989-95 and 1973-78 cohorts from 1996 to 2020

	Items	Cycles	Women
Number	24,358	7,137	1,537
Benefit paid	\$18,898,635	-	\$12,296
Gap	\$11,581,859	-	\$7,536
Type	-	16.0% IUI	9.2% IUI
		84.0% IVF	72.2% IVF
			18.6% Both

7.7.2 Use of ART by demographic characteristics

1989-95 cohort

At their first ART treatment, women from the 1989-95 cohort had an average age 25.6 years (SD = 2.6) and with 90% of women accessing ART for the first time between 21 and 29 years of age. The majority of women accessing ART had a partner, lived in major cities, and had some degree of financial stress, and 50% of the women had a BMI in the overweight or obese categories (Table 7-6). Approximately two in five women seeking ART reported PCOS (42%), which is almost triple the PCOS prevalence observed in the entire cohort. One in four women reported endometriosis (25%), which is more than double the endometriosis prevalence in the entire cohort.

1973-78 cohort

At the time of their first ART treatment, women in the 1973-78 cohort had an average age 34.2 years (SD = 4.7), with 90% of the women using ART for the first time between 26 and 42 years of age. The majority had a partner, lived in major cities, did not have financial stress, and around one-third had a BMI in the overweight or obese categories (Table 7-6). Almost half of the women had a university education. One in four women (25%) reported endometriosis, which is double the endometriosis prevalence observed in the entire 1973-78 cohort. One in five women (20%) reported PCOS, which is more than double the PCOS prevalence in the entire 1973-78 cohort. Almost 20% had given birth prior to commencing ART treatment.

Table 7-6 Demographic characteristics at first ART cycle, by ALSWH cohort.

	1989-95 Cohort 17-30 years	1973-78 cohort 19-30 years	1973-78 cohort ¹ 19-45 years
	N (%)	N (%)	N (%)
Number of women (N)	215	211	1322
Area of residence			
<i>Major city</i>	135 (62.8)	109 (50.0)	871 (65.9)
<i>Inner region</i>	51 (23.7)	69 (31.6)	291 (22.0)
<i>Outer/remote</i>	29 (13.5)	40 (18.4)	160 (12.1)
Difficulty managing on income			
<i>Easy</i>	25 (11.8)	36 (16.5)	301 (22.8)

	1989-95 Cohort 17-30 years	1973-78 cohort 19-30 years	1973-78 cohort ¹ 19-45 years
	N (%)	N (%)	N (%)
<i>Not bad</i>	66 (31.1)	86 (39.5)	556 (42.1)
<i>Difficult sometimes</i>	83 (39.2)	61 (28.0)	311 (23.5)
<i>Difficult always/impossible.</i>	38 (17.9)	35 (16.1)	153 (11.6)
Highest educational qualification			
≤ Year 12	48 (22.6)	96 (44.2)	351 (26.6)
<i>Trade/Diploma</i>	84 (39.6)	70 (32.3)	329 (24.9)
<i>University</i>	80 (37.7)	51 (23.5)	641 (48.5)
Marital status			
<i>No partner</i>	77 (36.3)	49 (22.5)	422 (32.0)
<i>Has partner</i>	135 (63.7)	169 (77.5)	899 (68.1)
BMI category			
<i>Under/normal weight</i>	105 (50.0)	133 (65.5)	800 (63.0)
<i>Overweight</i>	45 (21.4)	46 (22.7)	262 (20.7)
<i>Obese</i>	60 (28.6)	24 (11.8)	207 (16.3)
Endometriosis ¹			
<i>No</i>	160 (75.1)	134 (70.9)	860 (75.1)
<i>Yes</i>	53 (24.9)	55 (29.1)	285 (24.9)
PCOS ¹			
<i>No</i>	123 (57.8)	124 (72.1)	835 (80.5)
<i>Yes</i>	90 (42.2)	48 (27.9)	202 (19.5)
Had previously given birth			
<i>No</i>	199 (92.6)	186 (85.3)	1065 (80.6)
<i>Yes</i>	16 (7.4)	32 (14.7)	257 (19.4)

¹Endometriosis and PCOS could have been indicated at any survey, rather than the survey before first ART treatment. Number of missing values for endometriosis is N = 179 and for PCOS is N = 287.

7.7.3 Use of ART by age

1989-95 cohort

To date, the use of IVF has been higher than the use of IUI at almost all ages among women born 1989-95 (Figure 7-14). IVF use generally increased as women aged. The lower use of ART at 29-30 years reflects the age range of the cohort, as most of the women at Survey 6 (2019/20) have not yet reached 30 years of age. It must also be

noted that at the time of writing, MBS data were only available for the first six months of 2020 therefore 2020 data are incomplete.

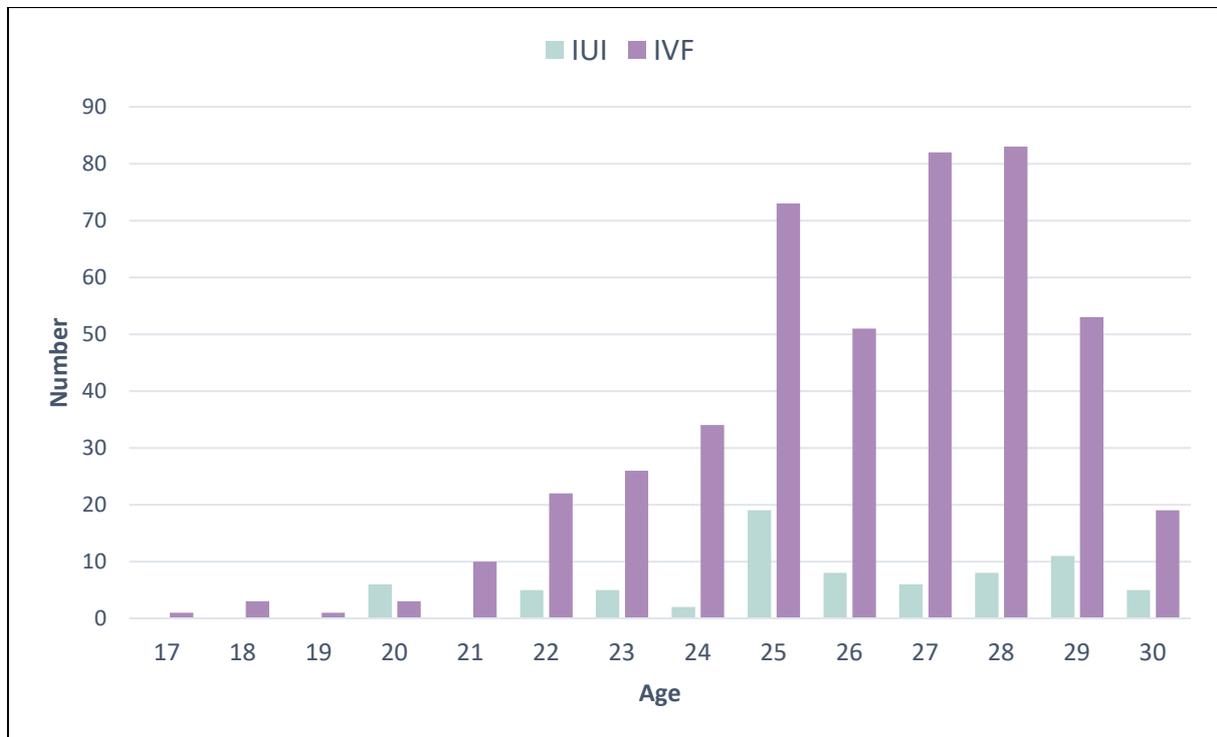


Figure 7-14 Use of IVF and IUI by age among women participating in the 1989-95 cohort.

Women were classified as ‘early starters’ if they had their first ART treatment before 25 years of age, which was the case for 61 women (29%) born 1989-95 who have used ART services. Compared with women who first accessed ART services when aged 25 or older (‘typical starters’), early starters tended to live outside major cities and not have a partner (Figure 7-15). There were no substantive differences between early and typical starters with respect to BMI, or reproductive health problems such as endometriosis or PCOS. Five of the early starters had reported cancer at Survey 1, while none of the typical starters have reported cancer.

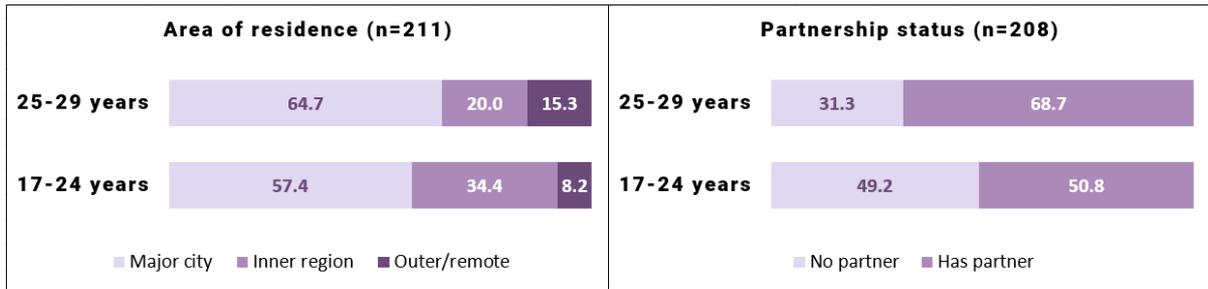


Figure 7-15 Early ART starters (age 17-24, N = 61) v typical ART starters (age 25-30, N = 150) for women in the 1989-95 cohort.

1973-78 cohort

In the 1973-78 cohort, women typically commenced using ART between 30 and 39 years of age (Table 7-7). IVF use was consistently higher than IUI use. Use of IUI services peaked at 32-33 years and use of IVF services peaked at 36-39 years (Figure 7-16).

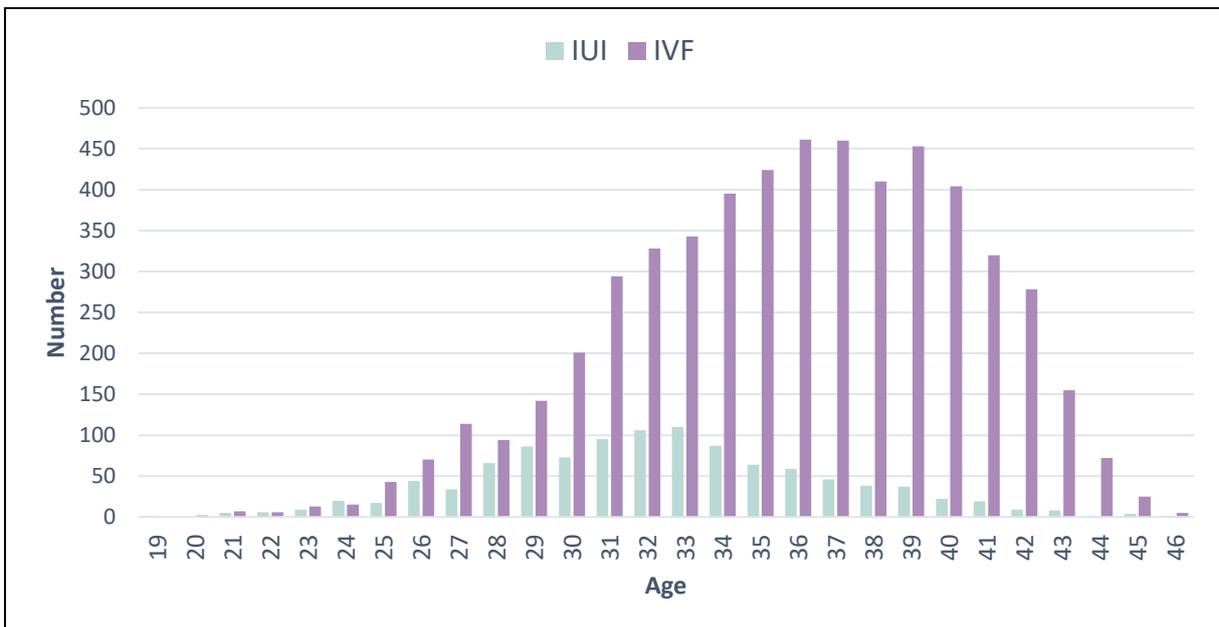


Figure 7-16 IVF use by age 36-40 years among women from the 1973-78 cohort.

Table 7-7 Age at first ART treatment (1973-78 cohort)

Age classification	Age	N (%)
'Early starters'	17-24 years	29 (2.2)
	25-29 years	189 (14.3)
'Younger typical starters'	30-34 years	460 (34.8)
'Older typical starters'	35-39 years	451 (34.1)
'Late starters'	40-45 years	193 (14.6)

Women were classified as younger typical starters if they had their first ART treatment at 30-34 years, older typical starters if first ART use was at 35-39 years, and late starters if age at first ART use was at 40-45 years (Table 7-7). More late starters did not have a partner compared to women who accessed ART at younger ages, and more younger typical starters had a BMI in the overweight/obese category and lived outside cities compared to older typical and late starters (Figure 7-17). There were no apparent differences in financial difficulty.

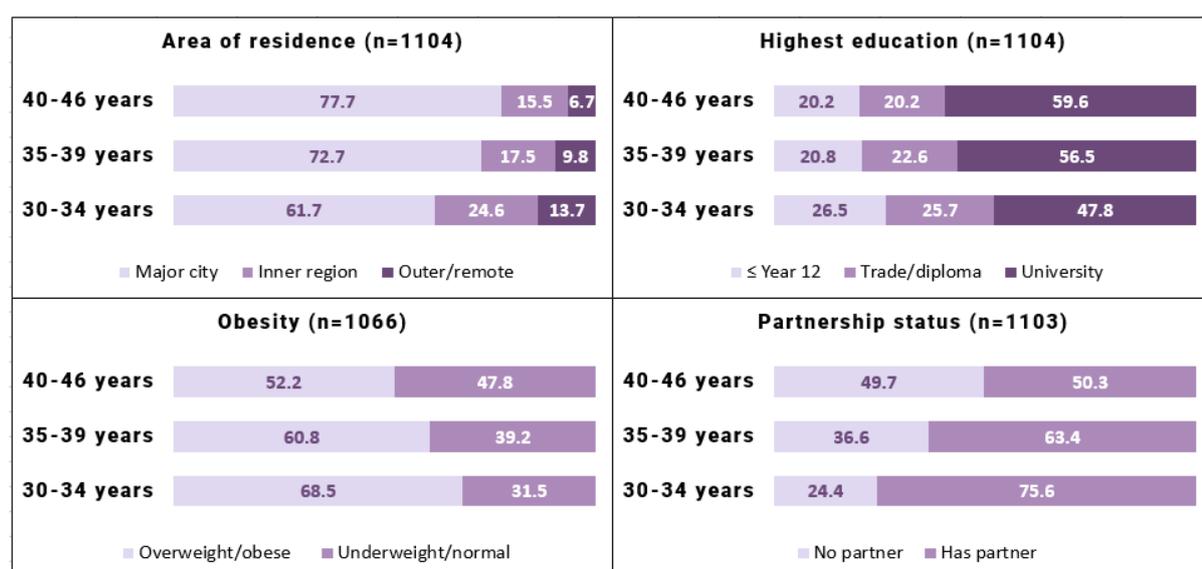


Figure 7-17 Demographic characteristics by age at first ART for the 1973-78 cohort.

Younger typical starters (30-34 years) had the highest prevalence of both endometriosis and PCOS (Figure 7-18). There were no differences between groups by whether they reported a birth before starting their ART treatment. However, only 28% of late starters reported a birth by Survey 8 (note: births cannot be linked to ART treatment).

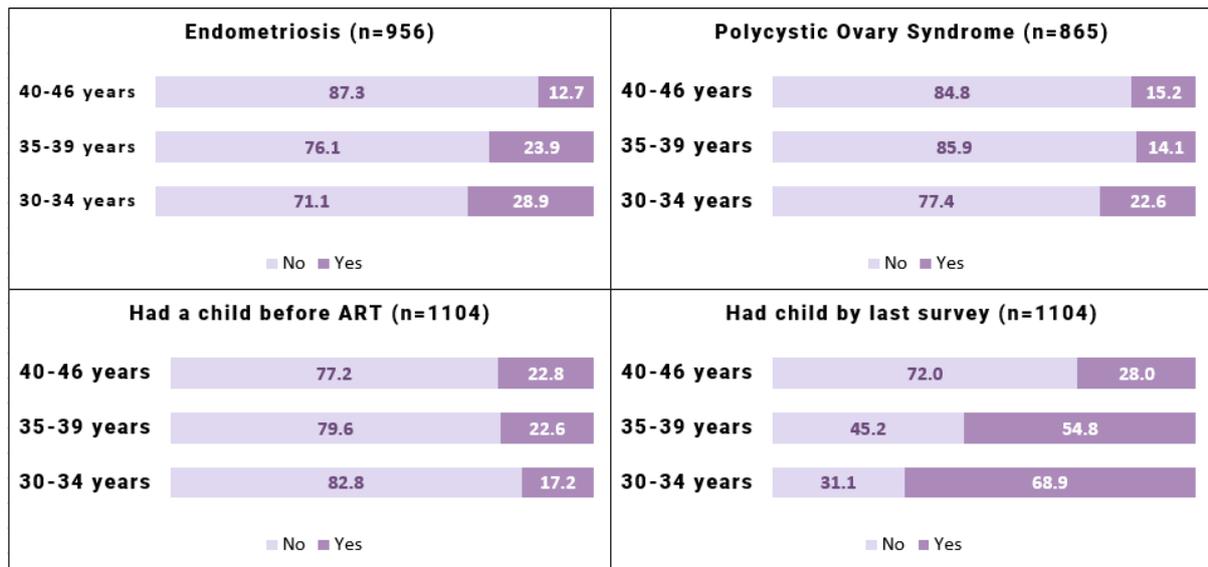


Figure 7-18 Reproductive characteristics by age at first ART for the 1973-78 cohort.

Very few late starters (aged 40-45) used IUI, with 90% using IVF only, while younger typical starters (aged 30-34) had the highest use of IUI services (Table 7-8).

Table 7-8 Use of IVF and IUI by age category (1973-78 cohort)

Age category	30-34 years	35-39 years	40-45 years
	N (%)	N (%)	N (%)
IUI only	51 (11.1)	26 (5.8)	6 (3.1)
IVF only	294 (63.9)	357 (79.2)	173 (89.6)
Both	115 (25.0)	68 (15.0)	14 (7.3)

7.7.4 Use of ART by treatment type

Looking across the whole course of ART treatments, women were classified as having undertaken IUI only, IVF only, or both IUI and IVF. In both cohorts, the majority of women only used IVF (71-81%, Table 7-9).

Comparing the two cohorts at similar ages, IUI use was higher in the 1973-78 cohort (48.6%), with a smaller percentage of the 1989-95 cohort using IUI (19.5%; Table 7-9). However, as previously noted, comparing cohorts is problematic as most of the 1989-95 cohort have yet to reach 30 years.

Table 7-9 ART treatment type, by cohort

	1989-95 Cohort	1973-78 cohort	1973-78 cohort
	17-30 years	19-30 years	19-45 years
	N (%)	N (%)	N (%)
IUI only	20 (9.3)	39 (17.9)	122 (9.2)
IVF only	173 (80.5)	112 (51.4)	936 (70.8)
Both	22 (10.2)	67 (30.7)	264 (20.0)

Treatment types varied by type of reproductive problem. More women with endometriosis tended to use both IVF and IUI, whereas women with PCOS tended to use IUI only (Table 7-10).

Table 7-10 ART treatment type by reproductive characteristics

	IUI only	IVF only	Both	p
	N (%)	N (%)	N (%)	
Overall	142 (100)	1,109 (100)	286 (100)	-
Endometriosis ¹				
No	93 (75.0)	761 (77.3)	166 (66.4)	.002
Yes	31 (25.0)	223 (22.7)	84 (33.6)	
PCOS ¹				
No	76 (65.5)	714 (79.2)	168 (72.4)	.001
Yes	40 (34.5)	188 (20.8)	64 (27.6)	

	IUI only	IVF only	Both	
Had previously given birth				
No	109 (76.8)	894 (80.6)	261 (91.3)	<.001
Yes	33 (23.2)	215 (19.4)	25 (8.7)	

Note: "Treatment type" was categorised based on all treatment cycles.

¹Endometriosis and PCOS could have been indicated at any survey, rather than the survey before first ART treatment. Number of missing values for endometriosis is N = 179 and for PCOS is N = 287.

7.8 Conclusion

This chapter explored pregnancy intentions, reproductive conditions, fertility problems, and use of ART in the 1989-95 and 1973-78 cohorts. Some of the findings presented here have potential policy implications.

Almost 20% of the 1973-78 cohort had not reported any births by age 45. Policy initiatives for women's health need to account for this by not assuming all women will bear children, and by ensuring health professionals are aware of the health issues that pertain to women who do not have children.

Overall, 9-15% of women reported reproductive health problems (endometriosis and PCOS), and in the linked MBS data for ART treatment it was 20-42%. Women with endometriosis had undertaken a higher number of ART cycles on average. This suggests reproductive health problems are prevalent, and that more women with reproductive health problems are likely to seek ART treatment.

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8. PERINATAL MENTAL HEALTH

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8.1 Key messages

- Rates of screening for perinatal mental health have increased, with 85% of women born 1973-78 reporting being screened in 2009, compared to 91% of women in 2018.
- Women born 1989-95 with no formal qualifications were less likely to report being screened for perinatal mental health issues than those women with higher qualifications.
- Women born 1989-95 have higher rates of perinatal depression and anxiety than women born 1973-78.
- For women born 1989-95 and 1973-78, postnatal diagnoses for depression and anxiety were more common than antenatal diagnoses.
- Among first births, 46% of women born 1989-95 and 37% of women born 1973-78 experienced a traumatic birth (emergency caesarean, labour lasting more than 36 hours, emotional distress during labour, or stillbirth).
- For women born 1989-95 and 1973-78, traumatic birth experiences were associated with an increase in the risk of perinatal depression or anxiety, even after controlling for selected sociodemographic factors and history of mental health issues (OR = 1.74 (95%CI = 1.30, 2.33) and OR = 1.63 (95%CI = 1.40, 1.88), respectively).

8.2 Introduction

A number of studies using ALSWH data from the 1973-78 cohort have contributed to the body of research on perinatal mental health in Australia. The studies report on perinatal mental health data captured at regular surveys, in addition to the 2011 Bupa Foundation funded Perinatal Mental Health Substudy and the 2016 NHMRC funded Mothers and their Children's Health (MatCH) study. A range of analyses have already been undertaken to identify risk factors for perinatal mental health disorders, to examine health care costs and optimal timing of perinatal mental health interventions,

as well as the evaluation of aspects of perinatal mental health screening. This chapter synthesises recent relevant ALSWH research and provides a contemporary update for perinatal mental health screening and the prevalence of perinatal mental health in the 1989-95 and 1973-78 ALSWH cohorts. This chapter also examines the impact of traumatic birth experiences on postnatal mental health.

8.3 Perinatal mental health screening

8.3.1 Screening for perinatal anxiety and depression in the 1973-78 cohort

Of the 1,180 women born 1973-78 who had answered perinatal screening questions for their most recent child, 256 women (22%) responded at Survey 5 in 2009 for their most recent child, 252 women (21%) responded at Survey 6 in 2012, 163 women responded at Survey 7 in 2015 (13.8%), and 509 women (43.1%) responded at Survey 8 in 2018. For more information on the sample used for these analyses, see [Appendix 11.6.1](#).

Among women who responded to the question about perinatal screening regarding their most recent child (N = 1,180) reported after Survey 4 (2006), the majority of women (89.7%) indicated they had been asked about their emotional wellbeing at some point during the perinatal period (see Table 8-1). Half (53.9%) of women born 1973-78 reported being screened both during their pregnancy and after birth, and almost one in five women reporting being asked only during their pregnancy (18.4%) or only after giving birth (17.6%).

Screening rates appear to have increased over time, with a higher proportion of women reporting that they were screened for poor perinatal mental health during both antenatal and postnatal periods for their most recent pregnancy in 2018 (63%), compared to 2009 (42%). Perinatal screening did not appear to be associated with area of residence, financial stress or difficulties, or with having a culturally or linguistically diverse background. Women with histories of mental health issues were slightly less likely to report perinatal mental health screening than those without such histories (49% and 55%, respectively).

Table 8-1 Antenatal and postnatal emotional wellbeing screening for the most recent birth among 1,180 Australian women born 1973-78, according to socio-demographic factors

	Asked about emotional wellbeing during antenatal and/or postnatal periods								
	No		During pregnancy only		After pregnancy only		Both during pregnancy and after pregnancy		P
	N	%	N	%	N	%	N	%	
Survey (year, age)									
5 (2009, 31-36 years)	38	14.8	52	20.3	58	22.7	108	42.2	<0.001
6 (2012, 34- 39 years)	21	8.3	48	19.0	50	19.8	133	52.8	
7 (2015, 37-42 years)	18	11.0	36	22.1	34	20.9	75	46.0	
8 (2018, 40-45 years)	45	8.8	78	15.3	66	13.0	320	62.9	
Culturally and linguistically diverse									
No	107	10.1	190	18.0	184	17.4	577	54.5	0.62
Yes	15	12.3	24	19.7	24	19.7	59	48.4	
State									
New South Wales (NSW)	41	13.0	62	19.6	41	13.0	172	54.4	†
Victoria (VIC)	28	7.8	48	13.3	85	23.5	200	55.4	
Queensland (QLD)	25	12.0	55	26.4	29	13.9	99	47.6	
South Australia (SA)	9	12.9	16	22.9	11	15.7	34	48.6	
Western Australia (WA)	7	6.7	22	21.0	20	19.0	56	53.3	
Tasmania (TAS)	4	9.5	3	7.1	8	19.0	27	64.3	
Northern Territory (NT)	0	0.0	1	8.3	3	25.0	8	66.7	
Australian Capital Territory (ACT)	2	10.0	4	20.0	1	5.0	13	65.0	
Overseas	3	21.4	2	14.3	3	21.4	6	42.9	
Area of residence (ARIA+)									
Major cities	68	9.6	125	17.7	138	19.5	377	53.2	0.59
Inner regional	30	11.2	56	20.9	39	14.6	143	53.4	
Outer regional	13	10.2	24	18.8	18	14.1	73	57.0	
Remote/very remote	3	13.6	6	27.3	4	18.2	9	40.9	
Education									
Less than Year 12	7	9.3	17	22.7	11	14.7	40	53.3	0.13

	Asked about emotional wellbeing during antenatal and/or postnatal periods								
	No		During pregnancy only		After pregnancy only		Both during pregnancy and after pregnancy		P
	N	%	N	%	N	%	N	%	
Year 12 or equivalent	13	11.1	21	17.9	22	18.8	61	52.1	
Certificate/Diploma	35	12.0	66	22.7	42	14.4	148	50.9	
University	61	9.3	98	14.9	124	18.9	374	56.9	
Ability to manage on available income									
Impossible/Difficult all the time	19	10.0	42	22.1	35	18.4	94	49.5	0.44
Difficult some of the time	41	11.1	71	19.2	60	16.3	197	53.4	
Not too bad/Easy	58	9.8	94	15.9	106	17.9	335	56.5	
How stressed about money									
Not at all stressed	34	12.6	44	16.4	44	16.4	147	54.6	0.66
Somewhat stressed	39	8.6	76	16.8	81	17.9	256	56.6	
Moderately stressed	21	8.9	45	19.1	44	18.6	126	53.4	
Very stressed	15	11.9	25	19.8	21	16.7	65	51.6	
Extremely stressed	10	12.5	20	25.0	14	17.5	36	45.0	
History of mental health issues									
No	94	9.8	165	17.2	169	17.7	529	55.3	0.25
Yes	25	12.1	45	21.8	35	17.0	101	49.0	

† due to low frequencies in some cells, it was not valid to conduct a statistical test on this factor.

8.3.2 Screening for perinatal anxiety and depression in the 1989-95 cohort

Of the 1,083 women who had answered the perinatal screening question for their most recent child, 179 women (17%) responded at Survey 5 for their most recent child, while 904 women (83%) responded at Survey 6. For more information on the sample used for these analyses, see [Appendix 11.6.2](#).

Among women who responded to the question about perinatal screening regarding their most recent child (N = 1,083), most women (94.4%) indicated they had been asked about their emotional wellbeing at some point during the perinatal period (see Table 8-2). Seven out of ten women born 1989-95 reported being screened both

during pregnancy and after birth, 16% were screened only during pregnancy, and 7.1% were screened only after birth.

Among women born 1989-95, those who had less than Year 12 qualifications were less likely to report perinatal screening compared to women with higher qualifications. Perinatal screening did not appear to be associated with year, area of residence, financial stress or difficulties, culturally or linguistically diverse background, or history of mental health issues.

Table 8-2 Antenatal and postnatal emotional wellbeing screening for their most recent birth among 1,083 Australian women born 1989-95, according to socio-demographic factors

	Asked about emotional wellbeing during antenatal and/or postnatal periods									
	No		During pregnancy only		After pregnancy only		Both during pregnancy and after pregnancy		P	
	N	%	N	%	N	%	N	%		
Survey (year, age)										
5 (2017, 21-27 years)	12	6.7	33	18.4	18	10.1	116	64.8	0.16	
6 (2019, 23-30 years)	49	5.4	140	15.5	59	6.5	656	72.6		
Culturally and linguistically diverse										
No	59	5.6	173	16.4	75	7.1	750	71.0	†	
Yes	2	7.7	0	0.0	2	7.7	22	84.6		
State										
New South Wales	12	4.4	44	16.0	17	6.2	202	73.5	†	
Victoria	11	4.6	31	12.9	27	11.3	171	71.3		
Queensland	21	8.4	57	22.8	9	3.6	163	65.2		
South Australia	6	6.5	12	12.9	9	9.7	66	71.0		
Western Australia	2	1.7	13	11.2	7	6.0	94	81.0		
Tasmania	2	4.9	7	17.1	1	2.4	31	75.6		
Northern Territory	1	11.1	0	0.0	2	22.2	6	66.7		
Australian Capital Territory	2	5.7	5	14.3	2	5.7	26	74.3		
Area of residence (ARIA+)										
Major cities	27	5.0	72	13.4	46	8.6	391	72.9	†	
Inner regional	19	8.2	50	21.5	11	4.7	153	65.7		
Outer regional	6	5.5	14	12.8	4	3.7	85	78.0		
Remote/very remote	1	4.8	4	19.0	1	4.8	15	71.4		
Education										
Less than Year 12	8	10.8	21	28.4	6	8.1	39	52.7	0.03	
Year 12 or equivalent	8	7.3	21	19.1	8	7.3	73	66.4		
Certificate/Diploma	15	4.8	43	13.7	20	6.4	236	75.2		

		Asked about emotional wellbeing during antenatal and/or postnatal periods								<i>P</i>
		No		During pregnancy only		After pregnancy only		Both during pregnancy and after pregnancy		
		N	%	N	%	N	%	N	%	
University		20	5.2	58	14.9	32	8.2	278	71.6	
Ability to manage on available income										
Impossible/Difficult all the time		18	10.3	25	14.4	13	7.5	118	67.8	0.09
Difficult some of the time		16	4.1	65	16.6	28	7.2	282	72.1	
Not too bad/Easy		22	4.5	76	15.7	33	6.8	354	73.0	
How stressed about money										
Not at all stressed		8	6.2	17	13.1	9	6.9	96	73.8	0.30
Somewhat stressed		18	4.9	63	17.0	25	6.8	264	71.4	
Moderately stressed		10	4.0	47	18.8	18	7.2	175	70.0	
Very stressed		9	5.3	26	15.3	14	8.2	121	71.2	
Extremely stressed		15	10.6	14	9.9	10	7.0	103	72.5	
History of mental health issues										
No		15	3.8	66	16.8	29	7.4	282	71.9	0.27
Yes		46	6.7	107	15.5	48	6.9	490	70.9	

† Due to low frequencies in some cells, it was not valid to conduct a statistical test on this factor.

8.3.3 Recent ALSWH perinatal mental health screening research

ALSWH data have previously been used to examine rates of perinatal mental health screening, and to evaluate the effectiveness of this screening. In 2014, Reilly et al. (2014) highlighted the importance of routine assessment of women's mental health in the perinatal period. Within a sample of 778 women who reported experiencing significant emotional distress during pregnancy or in the 12 months following birth, those not asked about their emotional health were less likely to seek formal help during pregnancy and the postpartum period than those who were asked. Similarly, those who were asked about their emotional health but not referred for additional support were less likely to seek formal help than those who were referred. These findings

indicated that routine assessment is positively associated with help-seeking during the perinatal period and also indicated the value and need for referral pathways.

Another study evaluated the impact of routine mental health assessment during the perinatal period on reported referrals for emotional health issues during pregnancy and the first postpartum year (Reilly et al., 2013). Among 1,804 women, assessment of past and current mental health and experience of significant emotional distress predicted being given a referral for emotional health issues during pregnancy and the postnatal period. Importantly, women who were asked about both their past and current mental health were up to 16 times more likely to receive a referral, compared to those who did not receive any form of mental health assessment. This suggested that enquiry into past and current mental health during the perinatal period enhances the initiation of referrals.

Despite the evidence supporting routine perinatal mental health screening, previous ALSWH research has also highlighted the shortfalls in screening, providing insight into areas for improvement (Reilly et al., 2013; Forder et al., 2020; Moss et al., 2020). Data from the perinatal mental health subsample were used to examine psychosocial assessment more broadly (Reilly et al., 2013). Two thirds of women (66.8%) reported current emotional health assessment in the antenatal period, and 75.6% in the postnatal period. Fewer women reported assessment of mental health history during pregnancy (52.9%) and after birth (41.2%). Finally, women were least likely to report assessment of their experience of domestic violence or abuse, with only 35.7% being asked in the antenatal period and 31.8% being asked in the postnatal period. Compared with women who gave birth in the private sector, those who gave birth in the public hospital sector were more likely to report being assessed across all five domains of assessment in the antenatal period. The study revealed a shortfall in assessment rates among mothers, particularly in the private sector.

A mixed methods study investigated honesty and comfort levels among mothers when screened for perinatal depression and anxiety (Forder et al., 2020). Of 1,597 women, more than one fifth (20.7%) reported that they had not always responded honestly when screened about their emotional wellbeing. Qualitative data on reasons for dishonesty encompassed four main themes: normalising of symptoms/coping,

negative perceptions, fear of adverse repercussions, and fear of involvement of health services. Furthermore, 38.9% of women reported that they did not feel comfortable when questioned about their emotional wellbeing by their health practitioner. These women were four times more likely to report perinatal depression, and nearly twice as likely to report perinatal anxiety, than those who did feel comfortable. This study revealed that women who were most likely to need perinatal mental health care were also the least likely to be honest about their mental health, warranting the need for an improved approach to screening to increase comfort and encourage honesty.

Rates of reported perinatal mental health screening over time have also been documented using longitudinal ALSWH data. Moss et al. (2020) examined data from 7,566 mothers between 2000 and 2017. During the study period, the percentage of women not screened decreased from 40.6% to 1.7%. The percentage of women reporting being screened both antenatally and postnatally increased from 21.3% to 79.3%. Women who were older or had reported emotional distress were less likely to have been screened both antenatally and postnatally, compared to younger women and those who had not reported emotional distress. Findings indicated that, although improvements were observed, perinatal mental health screening is not yet universal.

8.4 Prevalence of perinatal anxiety and depression

8.4.1 Cumulative prevalence

Figure 8-1 presents the cumulative prevalence for self-reported diagnoses of antenatal anxiety, antenatal depression, postnatal anxiety, and postnatal depression for mothers from the 1989-95 and 1973-78 cohorts. For both cohorts, postnatal diagnoses for depression and anxiety were more common than antenatal diagnoses. For women born 1973-78 (N = 7,186), 21% were diagnosed with postnatal mental health issues (depression and/or anxiety), and 7% were diagnosed with antenatal mental health issues. Similarly, for women born 1989-95 (N = 1,537), postnatal diagnoses for depression and anxiety were more common (37%) than antenatal diagnoses (22%). During the antenatal period, anxiety diagnoses tended to be reported slightly more

than depression, while depression was more common in the postnatal period. However, it is important to note that depression and anxiety often coexist.

Diagnoses for perinatal depression and anxiety were more commonly reported among women born 1989-95 (42%) than among women born 1973-78 (22%). Among women born 1989-95, perinatal depression and/or anxiety was more commonly reported among women with two or more children (51%) than women with one child (36%). However, among women born 1973-78, the prevalence of perinatal depression and/or anxiety was not dissimilar among women with two or more children (23%) compared with women with one child only (21%).

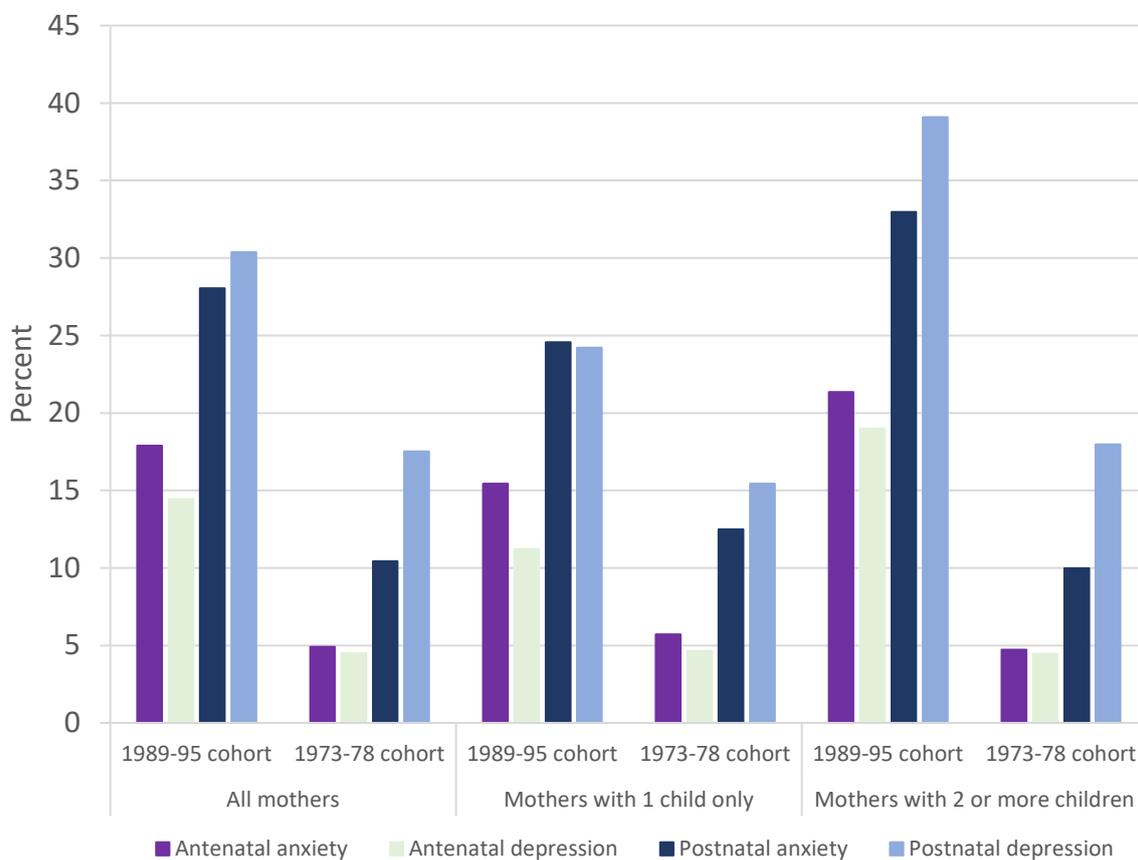


Figure 8-1 Cumulative prevalence of self-reported diagnosed antenatal and postnatal mental health (depression and anxiety) in women born 1989-95 and 1973-78, according to parity.

8.4.2 Perinatal mental health over time

Consistently over time, postnatal depression has been diagnosed more frequently than antenatal depression (Figure 8-2). For women born 1973-78, the annual rate of antenatal depression diagnoses remained reasonably stable at around 2-3% from 1996 to 2014, increasing to around 4-5% by 2018. For the same women, the annual rate of postnatal depression diagnoses gradually decreased from around 13% in 1996 to approximately 6% in 2014, before increasing again to around 10-11% in 2018. However, the annual rates of perinatal depression diagnoses are higher for women born 1989-95, although the rates have decreased over time. From 2011 to 2019, the annual rate of antenatal depression among women born 1989-95 dropped from 18% to 10%, while the annual rate of postnatal depression dropped from around 30% in 2011 to 17% in 2019.

For both cohorts, and similar to perinatal depression rates, the annual rate of antenatal anxiety is consistently lower than the annual rate of postnatal anxiety (Figure 8-3). For women born 1973-78, both antenatal anxiety and postnatal anxiety slowly increased over time between 1996 and 2018, with antenatal anxiety increasing from around 1.9% in 1996 to 8% in 2017-2018, while postnatal anxiety increased from around 1.5% in 1996 to around 10% in 2015-2017, dropping slightly to 8% in 2018. For women born 1989-95, the annual rates of perinatal anxiety are much higher, with antenatal anxiety rates increasing from 15% in 2011 to 19% in 2019, while the annual rate of postnatal anxiety varied between 20% in 2011 to 27% in 2017, and then fell to 18% in 2019.

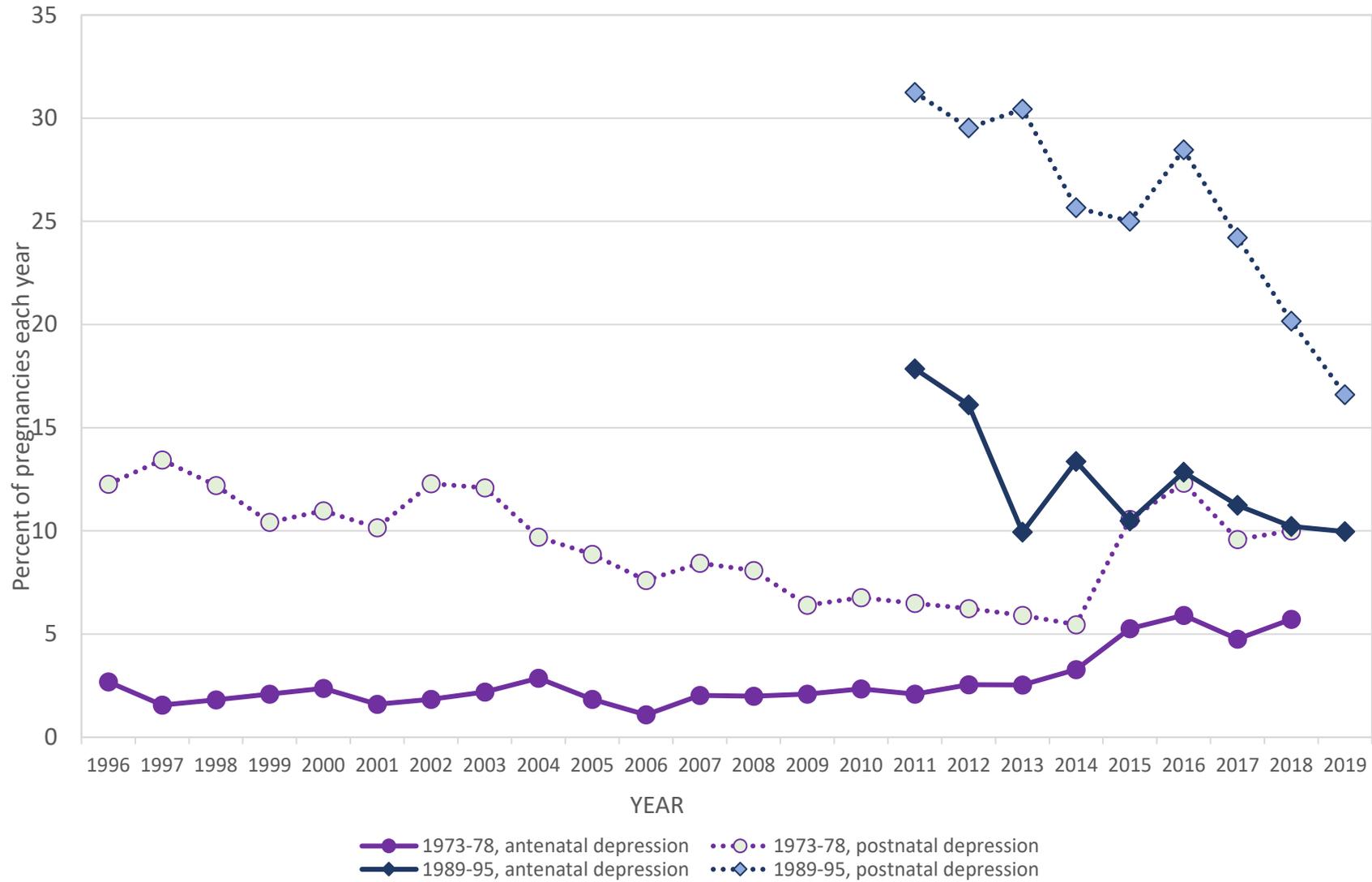


Figure 8-2 Antenatal depression and postnatal depression over time for women born 1989-95 and 1973-78.

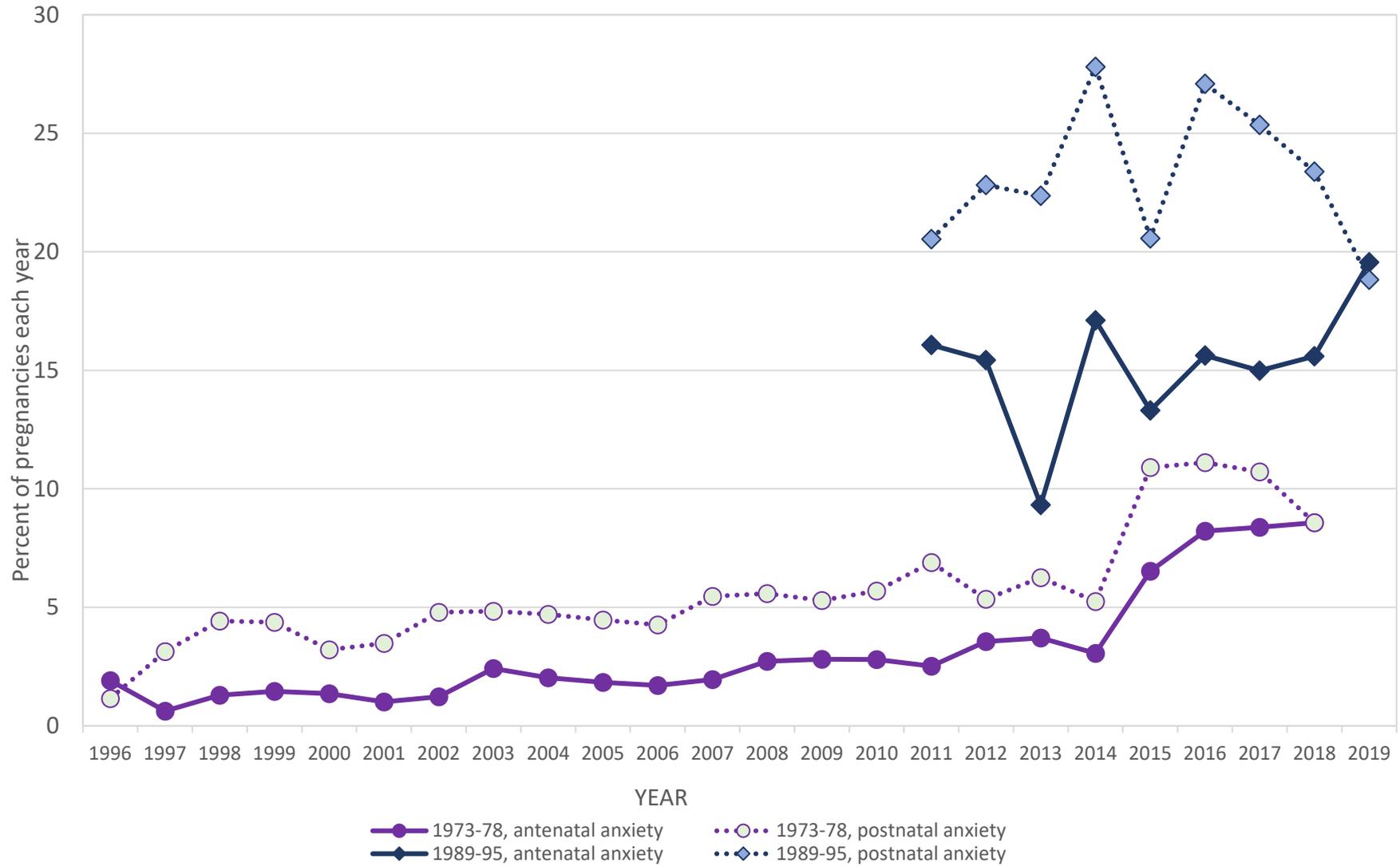


Figure 8-3 Antenatal anxiety and postnatal anxiety over time for women born 1989-95 and 1973-78.

8.5 Risk factors for perinatal depression and anxiety

8.5.1 History of mental health issues

Longitudinal data collected from 1996 to 2006 were used to examine the risk factors for postnatal depression among 2,451 mothers (Chojenta et al., 2012). Overall, 9.8% of women reported being diagnosed or treated for postnatal depression. Women who reported being diagnosed with or treated for depression three or six years preceding pregnancy were more than twice as likely to experience postnatal depression, compared to those who had not reported depression. Stressful life events also significantly predicted postnatal depression within the sample.

A later study assessed the importance of women's mental health history in regard to the detection of postnatal depression, using data from 5,219 mothers at Survey 5 (Chojenta et al., 2016). Over 15% of mothers reported that they had experienced postnatal depression with at least one child. At the multivariate level, postnatal anxiety and antenatal depression were strongly associated with postnatal depression. Strong links were also shown for a history of depression, poor mental health, emotional distress during labour, and breastfeeding for less than six months. These findings implied that the treatment and management of preceding mental health problems may be preventive of later postnatal depression.

8.5.2 History of poor mental health and health care costs in the perinatal period

Chojenta et al. (2019) examined the impact of a history of poor mental health on health care costs during the perinatal period. Linkage with national administrative datasets permitted a comparison of health care costs between those with and without a history of poor mental health between 2002 and 2011. Findings revealed that women with a history of poor mental health faced higher health care costs in the perinatal period, compared to those without such history. An average increase in cost of 11% per birth was observed for those with a history of poor mental health, regardless of birth type (i.e. vaginal, instrumental, caesarean) and private health insurance status. This study reinforced the need to address poor mental health prior to child bearing, in the interest

of cost saving in the perinatal period and the reduction of women experiencing poor perinatal mental health.

8.5.3 History of poor mental health and parenting post-birth

A recent analysis sought to better understand the mechanisms through which pre-conception maternal depression and child psychosocial functioning are related (Moss et al., 2020). Maternal and child factors were examined based on 2,917 mothers and their 5,532 combined children aged 0-12 who participated in the 2016 MatCH study. Results indicated a link between pre-conception maternal depression and poorer maternal mental health and parenting post-birth. This study highlighted pre-conception as the optimal time for depression intervention.

8.5.4 PCOS and perinatal mental health

Recently, Tay et al. (2019) addressed an important gap in the literature by examining perinatal mental health in relation to PCOS. Cross-sectional data from 5,239 women who had completed Survey 7 and had given birth were examined. Compared to women not reporting PCOS, those reporting PCOS had higher prevalence of the following perinatal mental disorders: antenatal depression (8.9% versus 4.4%), antenatal anxiety (11.7% versus 5.6%), postnatal depression (26.8% versus 18.6%), and postnatal anxiety (18.4% versus 12.0%). Moreover, after controlling for confounders, women with PCOS were almost twice as likely to report antenatal depression and/or anxiety as those without PCOS, however, no such association was shown for postnatal depression and/or anxiety. Nonetheless, findings underscored the need to screen for common perinatal mental disorders among women with PCOS.

8.5.5 Traumatic birth experiences and perinatal mental health

Previous work using ALSWH data has provided some insight into the impact of pregnancy loss on perinatal mental health (Chojenta et al., 2014). Using data from the ALSWH Perinatal Mental Health sub study conducted in 2011, the impact of pregnancy loss on women's mental health during a subsequent pregnancy and postpartum was examined. Among 584 mothers, 30.5% reported experiencing a pregnancy loss prior to the birth of their youngest child, including miscarriage,

termination due to medical reasons, ectopic pregnancy, and stillbirth. Controlling for demographics and mental health history, women who had experienced a previous pregnancy loss were more likely to experience sadness or low mood and excessive worry during a subsequent pregnancy than those without a history of pregnancy loss. These findings highlight the impact of pregnancy loss on perinatal mental health, and the need to investigate the relationship between traumatic birth experiences and perinatal mental health more broadly. The analysis below addresses this gap in knowledge by presenting preliminary results on the relationship between traumatic birth experiences and postnatal mental health.

Prevalence of traumatic birth experiences among first births

For the purposes of the following analysis, traumatic birth experiences included emergency caesarean (caesarean section after labour has started); labour lasting longer than 36 hours; emotional distress during labour; or stillbirth. This analysis included data on first births for women who had responded to questions on traumatic birth experiences and postnatal mental health (1,544 women born 1989-95 and 7,658 women born 1973-78).

Overall, 45.6% of women born 1989-95 and 36.9% of women born 1973-78 had experienced a traumatic birth during their first birth (Figure 8-4). Stillbirths were the least common traumatic birth experience, with 1.3% of women born 1989-95 and 0.7% of women born 1973-78 reporting this experience. Long labours were slightly more common, with 12% of women born 1989-95 and 9% of women born 1973-78 reporting this experience. Almost one in five women born 1989-95 and 1973-78 reported experiencing an emergency caesarean (18.3% and 18.5%, respectively). Emotional distress during pregnancy was more commonly reported by women born 1989-95 (32%) than by those born 1973-78 (22%). Of the women who had experienced a traumatic birth, 26% reported two traumatic birth experiences, while 5% of women in both cohorts reported three traumatic birth events.

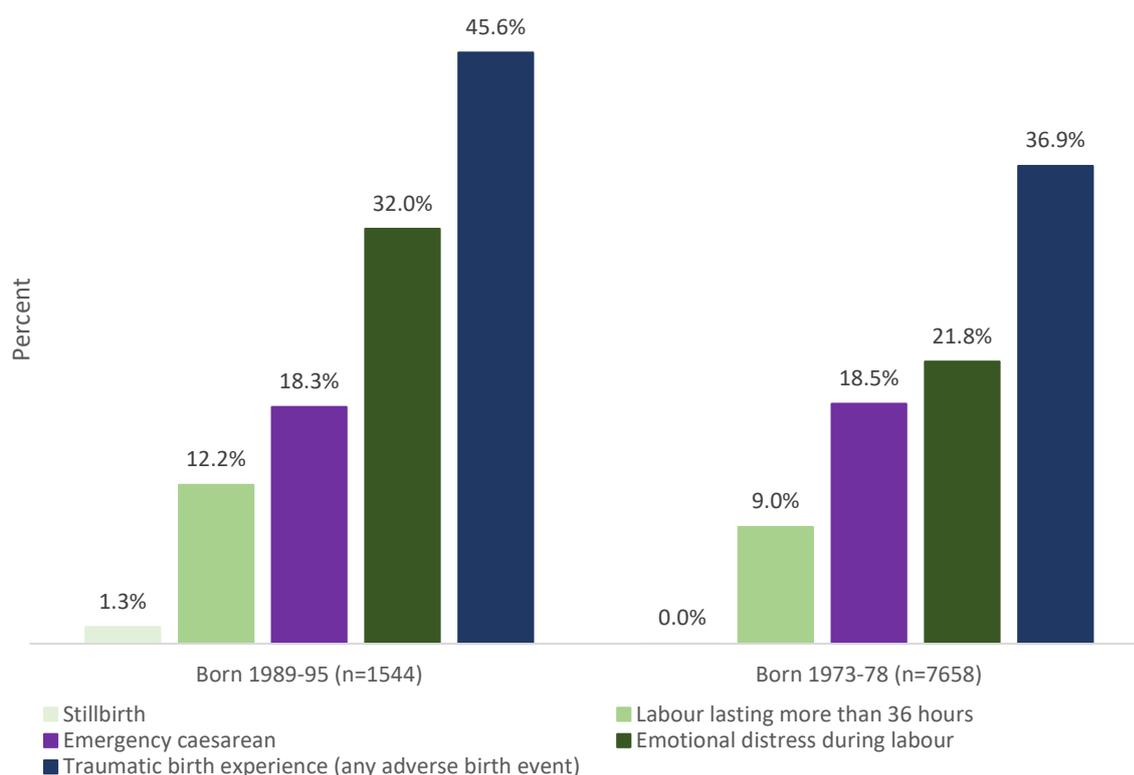


Figure 8-4 Traumatic birth experiences among first births for Australian women born 1989-95 and 1973-78

Prevalence of postnatal depression or anxiety among first births

Almost a third (31.6%) of women born 1989-95 reported diagnosed postnatal depression or anxiety. Around one in four (25.3%) women born 1989-95 reported being diagnosed with depression only, and one in five (23.0%) reported being diagnosed with anxiety only. Just over one in ten (13.9%) women born 1973-78 reported being diagnosed with postnatal depression or anxiety. One in ten (11.5%) women born 1973-78 reported being diagnosed with depression only, and 7% reported being diagnosed with anxiety only.

Association between traumatic birth experiences and postnatal mental health

Taking into account several sociodemographic factors and antenatal depression and anxiety, the influence of traumatic births on postnatal depression and anxiety for women born 1989-95 and 1973-78 was investigated separately. This analysis was restricted to women with complete covariate data.

As shown in Table 8-3, among women born 1989-95, the effect of having a traumatic birth on postnatal depression and anxiety was significant (Model 1). Even after controlling for sociodemographic factors (Model 2) and antenatal depression and anxiety (Model 3), women who had experienced a traumatic birth had 74% higher odds of being diagnosed with postnatal depression and anxiety, compared with women who did not experience a traumatic birth.

Table 8-3 Association of traumatic birth on postnatal depression or anxiety among first births for women born 1989-95, adjusting for sociodemographic factors and antenatal depression/anxiety

Women born 1989-95 N = 1,103*	Outcome: Postnatal depression or postnatal anxiety					
	MODEL 1		MODEL 2		MODEL 3	
	OR (95%CI)	P	OR (95%CI)	P	OR (95%CI)	P
Traumatic birth experience						
<i>No</i>	1		1		1	
<i>Yes</i>	1.93 (1.49, 2.50)	<0.001	1.85 (1.42, 2.41)	<0.001	1.74 (1.30, 2.33)	<0.001
Manage on available income						
<i>Easy/Not too bad</i>			1		1	
<i>Difficult some of the time</i>			1.21 (0.88, 1.66)	0.24	1.16 (0.82, 1.64)	0.39
<i>Always difficult/Impossible</i>			1.42 (0.98, 2.04)	0.06	1.01 (0.67, 1.53)	0.97
Highest qualification						
<i>University</i>			1		1	
<i>Certificate/Diploma</i>			1.36 (0.98, 1.90)	0.06	1.25 (0.87, 1.79)	0.23
<i>Year 12 or equivalent</i>			1.01 (0.66, 1.57)	0.95	0.98 (0.61, 1.58)	0.95
<i>Less than Year 12</i>			1.84 (1.04, 3.25)	0.035	2.01 (1.09, 3.71)	0.025
Area of residence						
<i>Major city</i>			1		1	
<i>Inner regional</i>			1.20 (0.88, 1.62)	0.25	1.16 (0.83, 1.61)	0.39
<i>Outer regional, remote, very remote</i>			1.00 (0.67, 1.48)	0.99	0.92 (0.59, 1.42)	0.70
Maternal age (years)			0.91 (0.86, 0.97)	0.003	0.90 (0.84, 0.96)	0.001

Women born 1989-95 N = 1,103*	Outcome: Postnatal depression or postnatal anxiety					
	MODEL 1		MODEL 2		MODEL 3	
	OR (95%CI)	P	OR (95%CI)	P	OR (95%CI)	P
Antenatal depression/anxiety						
No					1	
Yes					9.86(6.77, 14.37)	<0.001

* Restricted to women who had complete covariate data

Similarly, among women born 1973-78, the effect of having a traumatic birth on postnatal depression and anxiety was only slightly attenuated when sociodemographic factors (Model 2) and antenatal depression and anxiety (Model 3) were taken into account (Table 8-4). Women who had experienced a traumatic birth had 63% higher odds of being diagnosed with postnatal depression and anxiety, compared with women who did not experience a traumatic birth, after controlling for sociodemographic factors and antenatal depression and anxiety.

Table 8-4 Association of traumatic birth on postnatal depression or anxiety among first births for women born 1973-78, adjusting for sociodemographic factors and antenatal depression/anxiety

Women born 1973-78 N = 6,905*	Outcome : Postnatal depression or postnatal anxiety					
	MODEL 1		MODEL 2		MODEL 3	
	OR (95%CI)	P	OR (95%CI)	P	OR (95%CI)	P
Traumatic birth experience						
No	1		1		1	
Yes	1.77 (1.54, 2.03)	<0.001	1.72 (1.50, 1.98)	<0.001	1.63 (1.40, 1.88)	<0.001
Manage on available income						
Easy/Not too bad			1		1	
Difficult some of the time			1.30 (1.11, 1.52)	0.001	1.22 (1.03, 1.45)	0.020
Always difficult/Impossible			1.45 (1.16, 1.82)	0.001	1.20 (0.93, 1.53)	0.16

Women born 1973-78 N = 6,905*	Outcome : Postnatal depression or postnatal anxiety					
	MODEL 1		MODEL 2		MODEL 3	
	OR (95%CI)	P	OR (95%CI)	P	OR (95%CI)	P
Highest qualification						
<i>University</i>			1		1	
<i>Certificate/Diploma</i>			1.42 (1.19, 1.70)	<0.001	1.44 (1.20, 1.74)	<0.001
<i>Year 12 or equivalent</i>			1.50 (1.24, 1.81)	<0.001	1.47 (1.20, 1.80)	<0.001
<i>Less than Year 12</i>			1.38 (1.05, 1.82)	0.022	1.32 (0.98, 1.77)	0.07
Area of residence						
<i>Major city</i>			1		1	
<i>Inner regional</i>			0.92 (0.78, 1.09)	0.35	0.90 (0.76, 1.08)	0.27
<i>Outer regional, remote, very remote</i>			0.91 (0.75, 1.11)	0.35	0.89 (0.72, 1.10)	0.28
Maternal age (years)			1.03 (1.01, 1.05)	<0.001	1.01 (0.99, 1.03)	0.27
Antenatal depression/anxiety						
<i>No</i>					1	
<i>Yes</i>					20.93 (15.57, 28.13)	<0.001

* Restricted to women who had complete covariate data

8.6 Conclusion

Screening rates have increased over time, however women born 1989-95 have reported higher rates of poor perinatal mental health than women born 1973-78. The higher prevalence of mental health issues in women born 1989-95 needs to be investigated further as a matter of urgency. Women born 1989-95 are still in their prime childbearing years, while the 1973-78 cohort have mostly completed their families. Therefore, the already high rates of perinatal mental health issues in the 1989-95 cohort are likely to increase as more women in this age group start families, and those who have children continue to grow their families.

The high prevalence of traumatic births and the association between traumatic births and poor perinatal mental health underscore the need to enquire about past traumatic birth experiences as part of perinatal mental health screening in subsequent pregnancies. Past ALSWH research has demonstrated the value of perinatal mental health screening and has also highlighted the need to continue monitoring the responses of women to inquiries about their mental health during the perinatal period.

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9. MENOPAUSE

Authors: Hsin-Fang Chung, Katrina Moss, Gita D Mishra.

9.1 Key points

Natural menopause

- In the 1946-51 cohort, 90% of women reached natural menopause by age 55, with an average age at 50.9 years. However, 1.3% experienced premature menopause (<40 years), and 5.8% experienced early menopause (40-44 years).
- Women who were less educated, separated/divorced/single, and reported finding income management difficult all the time were more likely to have an earlier age at menopause.
- In the 1973-78 cohort, almost 10% of women had reached menopause by age 40-45 years, and 20% had entered perimenopause.
- Cigarette smoking, being underweight, early age at menarche (≤ 11 years), and nulliparity/low parity were associated with an increased risk of premature and early menopause. Smokers who quit smoking for more than ten years prior to the menopause can minimise this risk.
- Women with premature menopause or a very short reproductive lifespan (<30 years) had an increased risk of non-fatal CVD, especially early onset CVD events before age 60.

Hysterectomy and oophorectomy

- In the 1946-51 cohort, 37.9% of women had had a hysterectomy and/or oophorectomy by age 68-73 years – 12.6% reported a hysterectomy with bilateral oophorectomy (surgical menopause). The average age at hysterectomy was 46.3 years, with one third occurring before age 45.

- In the 1973-78 cohort, 5.7% of women had undergone a hysterectomy and/or oophorectomy by age 40-45 years – 0.8% reported a hysterectomy with bilateral oophorectomy.
- Earlier surgical menopause before age 45 was associated with an additional risk of CVD, compared with natural menopause at the same age.
- Women with hysterectomy/oophorectomy were at a higher risk of type 2 diabetes in both healthy weight and overweight/obese BMI groups.
- Hysterectomy with ovarian conservation before age 50 did not increase the risk of all-cause mortality, compared with the no hysterectomy group. However, women with hysterectomy and bilateral oophorectomy before age 50 who did not take MHT had an increased risk of premature mortality.

VMS; hot flushes and night sweats

- In the 1946-51 cohort, almost 25% of women experienced hot flushes 'often' at age 50-58 years. Only 5.8% still experienced hot flushes 'often' at age 68-73. The prevalence of night sweats 'often' was lower.
- Five symptom profiles of hot flushes were identified over a 20 year period from age 45-73 years: minimal (62.2%), later onset, resolved (17.4%), early onset (10.8%), later onset, not resolved (5.9%), and persistent (3.3%). The 'persistent' and 'later onset, not resolved' groups still experienced hot flushes at age 68-73 years. Similar results were found for night sweats.
- Three in four women who experienced hot flushes 'often' sought help at age 45-50, and this decreased over time to 25% at age 59-64. Of these women, 20-25% reported that they were not satisfied with the help given.
- In the 1973-78 cohort, less than 3% of women reported that they experienced hot flushes 'often' at age 37-45 years. However, help-seeking among those women experiencing hot flushes 'often' rose from 30.7% at age 37-42 to 41.3% at age 40-45.

- Cigarette smoking, having a BMI in the overweight/obese range, and a high fat-sugar diet were associated with a higher risk of VMS, while high intakes of soy products, fruit, and Mediterranean diet were associated with a lower risk of VMS. Women who quit smoking before age 40 had a similar level of risk as never smokers.
- Both hot flushes and night sweats were associated with increased risk of CVD, especially those experiencing both symptoms often.

MHT

- In the 1946-51 cohort, the use of MHT peaked at age 50-55 years (32.6%), and 7.3% were still taking MHT at age 68-73 years. Among women taking MHT at age 45-50, 52.4% reported a hysterectomy and/or bilateral oophorectomy.
- In the 1973-78 cohort, 1.4% reported currently taking MHT at age 40-45 years. Of these, 40.2% reported a hysterectomy and/or bilateral oophorectomy.

9.2 Introduction

Menopause is a natural part of ageing and marks the end of a woman's reproductive years. Menopause occurs when the ovaries no longer release an egg every month and menstruation stops. Menopause usually occurs between 45 and 55 years of age. Menopause before age 45 is called early menopause. Early menopause may occur naturally or following chemoradiation or removal of both ovaries.

During the menopausal transition, changes in hormones may lead to symptoms. Hot flushes and night sweats (VMS) are the main reason women seek treatment, and they may continue for ten years or more. For women who seek medical advice for their menopausal symptoms, hormone therapy (also known as menopausal hormone therapy) is the most effective treatment. This chapter includes new analyses and previous research findings for four main topics: natural menopause, hysterectomy/oophorectomy, VMS, and MHT.

9.3 Natural menopause

9.3.1 Background

Natural menopause is defined as the permanent cessation of menstruation resulting from a depletion of ovarian primordial follicles. It is diagnosed based on 12 consecutive months of amenorrhea that is not attributable to other causes. Some women experience induced menopause due to chemoradiation or removal of ovaries (oophorectomy). Timing of natural menopause is an important indicator for subsequent morbidity and mortality. Early menopause is associated with an increased risk of cardiovascular disease, type 2 diabetes, depression, and osteoporosis.

9.3.2 1946-51 cohort

Age at natural menopause

Age at menopause was determined from responses to the question 'if you have reached menopause, at what age did your periods completely stop' asked in Surveys 2-6 (when women of this cohort were aged 47-64 years). Natural menopause was confirmed by at least 12 months of cessation of menses not attributable to hysterectomy or bilateral oophorectomy. By age 59-64 years (at Survey 6), more than 95% of women had reached menopause (either naturally or surgically), 61.7% experienced natural menopause, and 34.3% had undergone a hysterectomy and/or bilateral oophorectomy.

Overall, 7,616 women reported experiencing natural menopause and recorded their age at last menstrual period (Figure 9-1). About 90% of women reached natural menopause by age 55, with an average age of 50.9 years (SD 4.3; range 31-63). Most women (82%) reported experiencing menopause between 45 and 55 years. However, 1.3% (N = 102) experienced premature menopause before 40 years, and 5.8% (N = 444) experienced early menopause between 40 and 44 years.

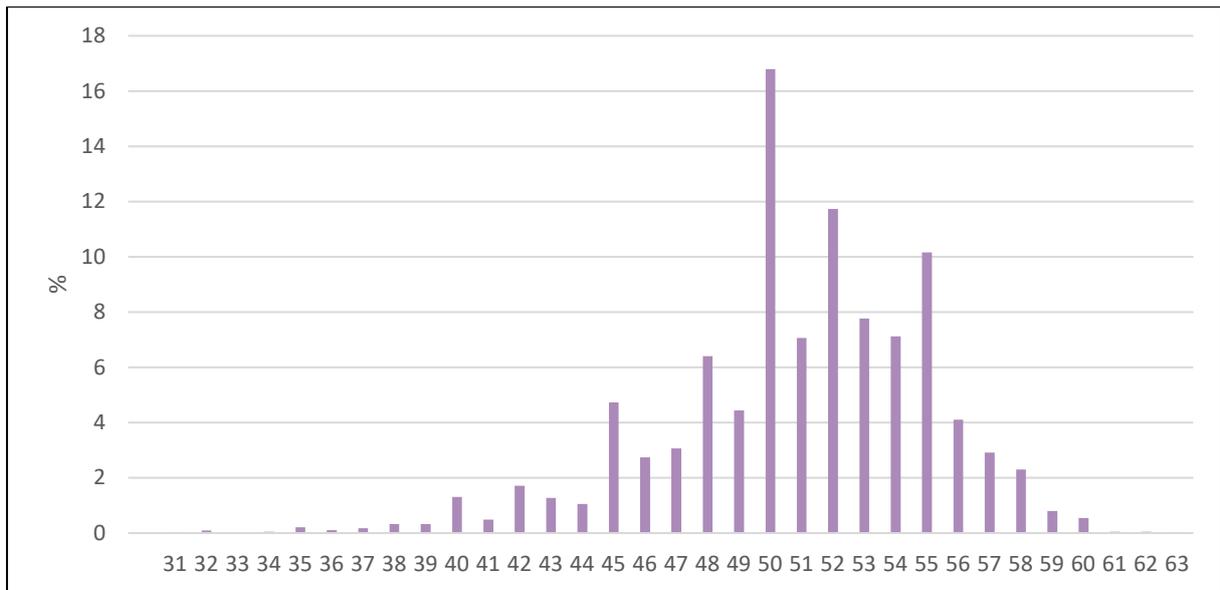


Figure 9-1 Age at natural menopause (N = 7,616).

Age at natural menopause by socio-demographic characteristics

Figure 9-2 shows the mean age at natural menopause by socio-demographic characteristics collected at age 45-50 years (at Survey 1). There was a delay in age at menopause for women with a university degree or higher, compared with those with no formal qualifications (51.5 vs 50.2 years). However, women who reported finding income management difficult all the time or impossible had an earlier age at menopause, compared with those who found income management easy (50.4 vs 51.0 years). Women who were separated/divorced or single also reported an earlier age at menopause (50.5 and 49.9 years, respectively), compared with those who were married or de facto (50.9 years). There was no apparent difference in age at menopause between women living in urban and rural/remote areas.

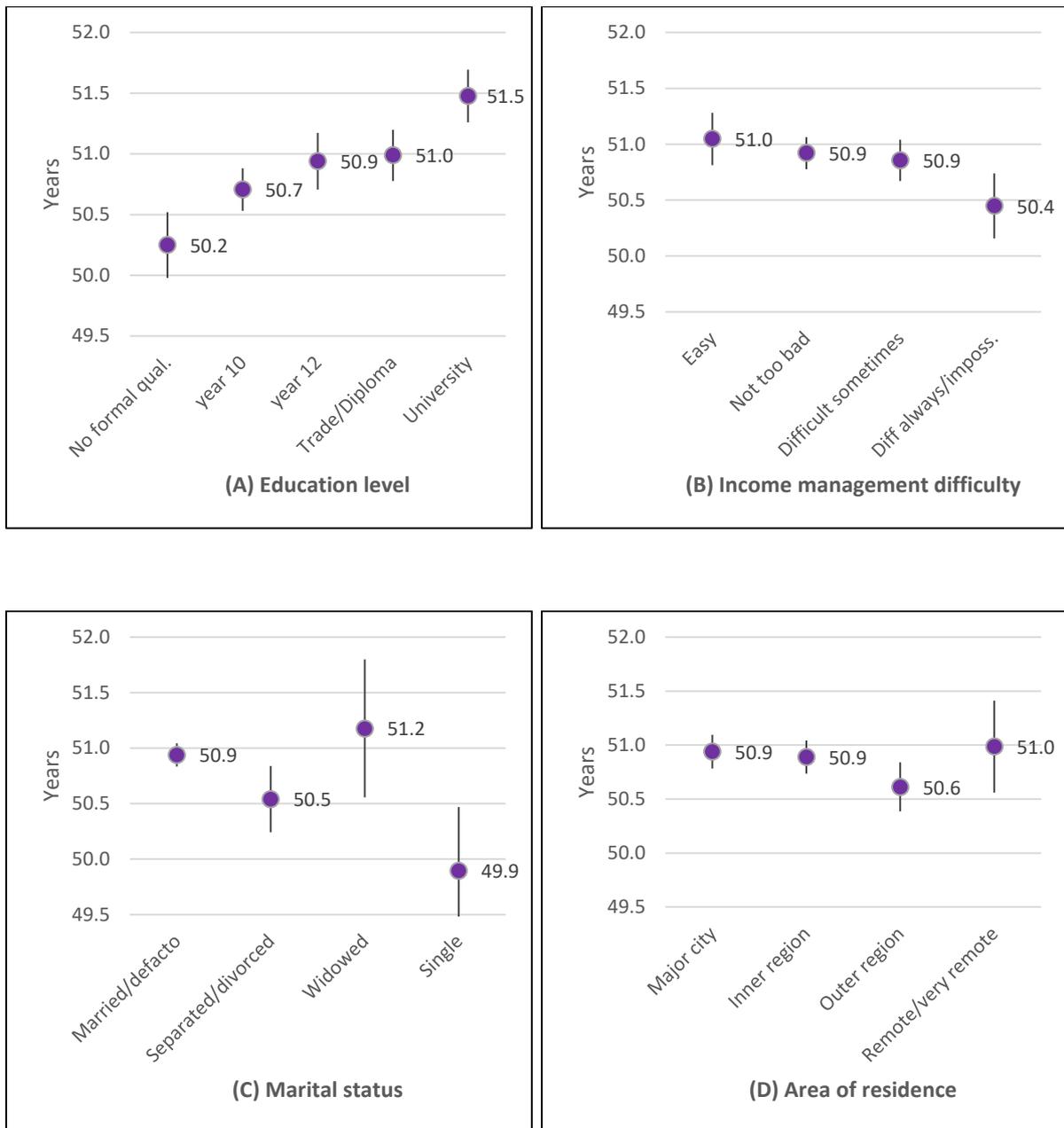


Figure 9-2 Mean age at natural menopause by (A) education level (N = 7,548), (B) income management difficulty (N = 7,573), (C) marital status (N = 7,581), and (D) area of residence (N = 7,615).

9.3.3 1973-78 cohort

When aged 40-45 years (at Survey 8; N = 6,731), almost one in ten (N = 667) women born 1973-78 had reached natural menopause, which is similar to the prevalence of early menopause in previous studies. Over 5% (N = 385) reported having had a hysterectomy and/or bilateral oophorectomy. Almost 20% had entered perimenopause, based on changes to the regularity of the menstrual period. Half (50.8%) were still premenopausal, based on having a menstrual period in the past two months and no changes to regularity. Menopausal status could not be determined for the remaining women due to the use of OCP (13.1%) or MHT (0.9%).

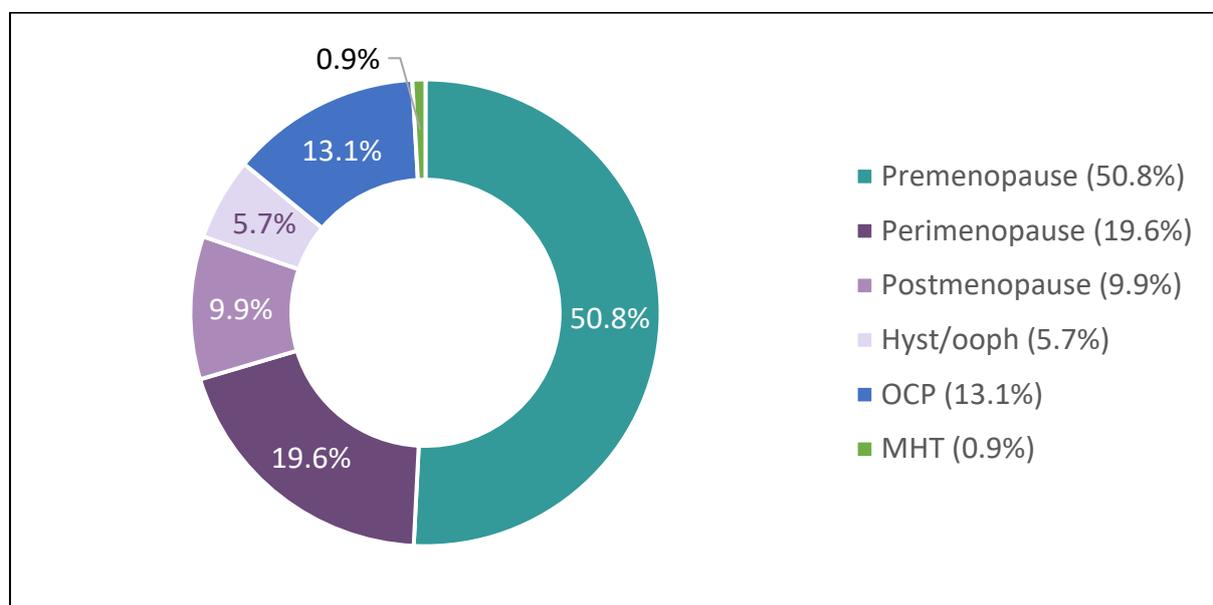


Figure 9-3 Menopausal status of the 1973-78 cohort at age 40-45 years (N = 6,731).

9.3.4 Previous research: predictors of premature and early menopause

Data collected from the 1946-51 cohort comprise a core dataset of the International collaboration on the Life course Approach to reproductive health and Chronic disease Events (InterLACE) consortium, which has pooled individual-level data from over 20 studies on women's reproductive health in midlife (Mishra et al., 2016). The InterLACE study reported that the mean age at natural menopause was 50.5 years, with substantial variations across racial/ethnic groups and education levels (Inter et al., 2019). Previous ALSWH and InterLACE research have shown certain lifestyle (Zhu et

al., 2018a; Zhu et al., 2018b), reproductive (Mishra et al., 2017), and social/environmental factors (Mishra et al., 2018) were associated with premature menopause (<40 years; also known as primary ovarian insufficiency) and early menopause (40-44 years). These findings, outlined below, have contributed to the EMAS position statement (Mishra et al., 2019).

- Women who currently smoked were at twice (95% CI 1.73-2.44) the risk of premature menopause (<40 years), while the risk was considerably lower for women who no longer smoked (only 15% increased risk), compared with women who had never smoked (Zhu et al., 2018b).
- Women who had quit smoking for more than ten years had a similar risk as those who had never smoked, suggesting women should quit smoking early, preferably before the age of 30 years (Zhu et al., 2018b).
- Underweight women (BMI<18.5 kg/m²) had over twice (95% CI 1.50-3.06) the risk of early menopause (<45 years), while women in the overweight or obese BMI category had a 50% (95% CI 1.18-2.01) increased risk of late menopause (≥56 years). These findings highlighted the role of optimal weight in reducing the risk of early or late menopause (Inter et al., 2019).
- Women with early menarche (≤11 years) had an 80% (95% CI 1.53-2.12) increased risk of premature menopause (<40 years), compared with those who experienced menarche at age 13 years. Nulliparous women had over twice (95% CI 1.84-2.77) the risk of premature menopause, compared with those with two or more children (Mishra et al., 2017).
- The combination of early menarche and nulliparity resulted in a five-fold (95% CI 4.04-7.87) increased risk of premature menopause, compared with women who experienced menarche at age 12 or older and women who had two or more children (Mishra et al., 2017).
- Women who experienced intimate partner violence had a 40% (95% CI 1.03-1.80) increased risk of early menopause (<45 years). This risk was attenuated and no longer significant after adjusting for smoking status. The mediation

analyses showed that cigarette smoking explained 36.7% of the overall relationship between intimate partner violence and early menopause (Mishra et al., 2018).

9.3.5 Previous research: early menopause and risk of chronic conditions

Previous studies have shown that age at menopause and the duration of the reproductive lifespan (defined as the time interval between menarche and menopause) were associated with the risk of non-fatal CVD events (Zhu et al., 2019; Mishra et al., 2020).

- Compared with women who experienced menopause at age 50-51 years, women who experienced premature menopause (<40 years) were at 1.5 times (95% CI 1.38-1.73) higher risk of CVD, and had almost twice (95% CI 1.62-2.20) the risk of having a CVD event before age 60 (Zhu et al., 2019).
- Women with a very short reproductive lifespan (<30 years) were at 1.7 times (95% CI 1.58-1.84) higher risk of CVD than those with a reproductive lifespan of 36-38 years (Mishra et al., 2020).
- These findings suggest that women who experience premature or early menopause need early screening tests (e.g., blood pressure, lipids, blood glucose) for monitoring cardiovascular health before age 60.

9.4 Hysterectomy and oophorectomy

9.4.1 Background

Hysterectomy is one of the most common gynaecological procedures performed in developed countries. In the past, bilateral oophorectomy (removal of both ovaries) was commonly performed at the time of hysterectomy for benign diseases in order to prevent ovarian cancer. Removal of normal ovaries is no longer recommended apart from women at high inherited risk of ovarian cancer.

9.4.2 1946-51 cohort

From Survey 1-9 (aged 45-73 years), ALSWH participants born 1946-51 were asked whether they had ever had a hysterectomy or both ovaries removed (bilateral oophorectomy). By age 68-73 years, over one third (37.9%) had undergone a hysterectomy and/or oophorectomy. 1.7% reported having both ovaries removed without a hysterectomy, 23.6% reported a hysterectomy with ovarian conservation, and 12.6% reported a hysterectomy and both ovaries removed (Figure 9-4).

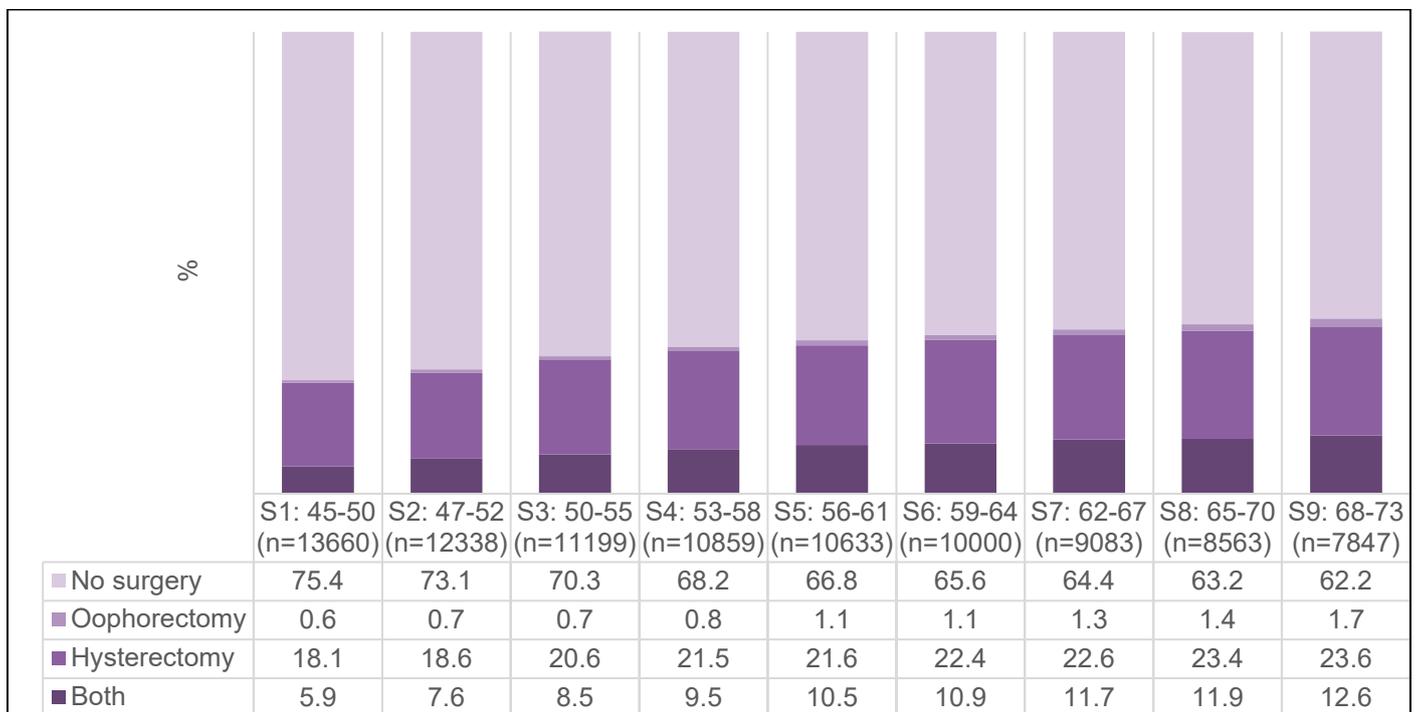


Figure 9-4 History of hysterectomy and/or oophorectomy over time.

Age at hysterectomy

Overall, 4,884 women born 1946-51 reported a hysterectomy and recorded their age at hysterectomy (Figure 9-5). The average age when a hysterectomy was performed was 46.3 years (SD 9.8; range = 17-73). One third (35.7%, N = 1,745) of women had undergone a hysterectomy before the age of 45 years, and 39.5% were between 45 and 50 years. The majority (87.1%) had undergone a hysterectomy before natural menopause.

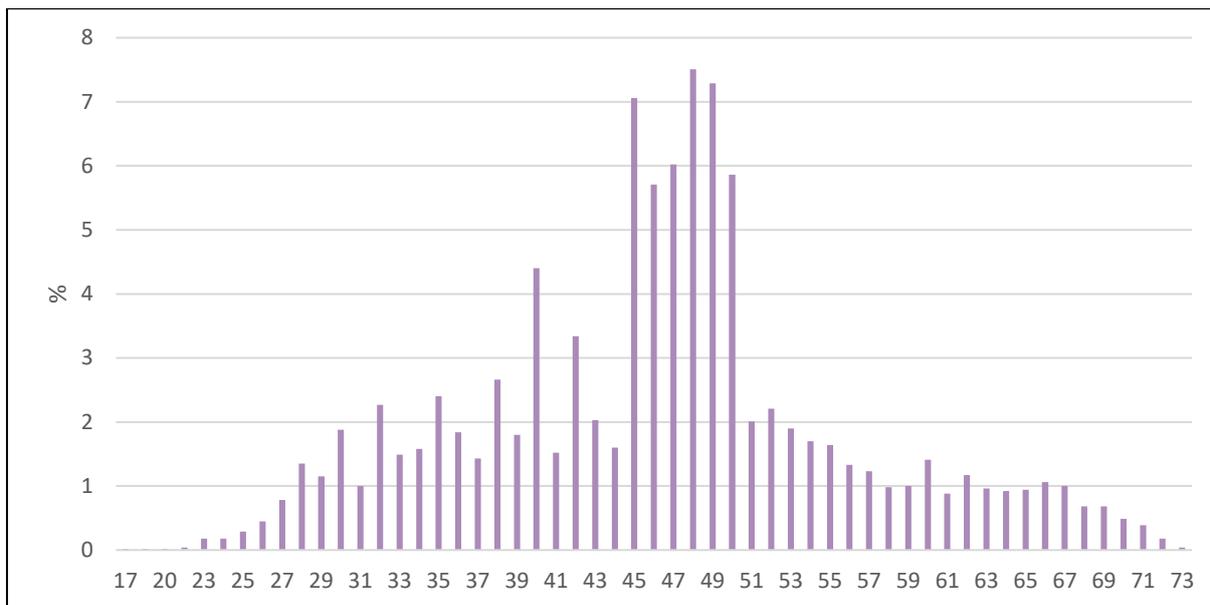


Figure 9-5 Age at hysterectomy (N = 4,884).

9.4.3 1973-78 cohort

In Surveys 5-8, participants born 1973-78 (then aged 31-45 years) were asked whether they had ever had a hysterectomy or both ovaries removed. By age 40-45 years (at Survey 8; N = 6,731), 5.7% (N = 385) had undergone a hysterectomy and/or oophorectomy: 0.3% (N = 20) reported having both ovaries removed without a hysterectomy, 4.6% (N = 310) reported a hysterectomy with ovarian conservation, and 0.8% (N = 55) reported a hysterectomy with both ovaries removed.

9.4.4 Previous research: hysterectomy, oophorectomy and risk of chronic conditions

Previous ALSWH and InterLACE research has shown that hysterectomy and oophorectomy were associated with increased risk of CVD (Zhu et al., 2020a), type 2 diabetes (Pandeya et al., 2018), depressive symptoms (Wilson et al., 2018), and all-cause mortality (Wilson et al., 2019).

- Hysterectomy with bilateral oophorectomy (defined as surgical menopause) was associated with over 20% higher risk of CVD (95% CI 1.16-1.28), compared with natural menopause (Zhu et al., 2020a).
- Earlier surgical menopause was associated with an additional risk of CVD compared with women with natural menopause at the same age. For instance, women with surgical menopause before 35 years (HR 2.55, 95% CI 2.22-2.94) had a much higher risk of CVD than those with natural menopause before 35 years (HR 1.59, 95% CI 1.23-2.05) (Zhu et al., 2020a).
- Hysterectomy and/or oophorectomy was associated with a 20% (95% CI 1.07-1.29) higher risk of type 2 diabetes after adjusting for BMI, compared with pre- and perimenopausal women (Pandeya et al., 2018).
- Women with a hysterectomy were at increased risk of incident depressive symptoms compared with those without a hysterectomy, with a slightly higher risk among those with a hysterectomy and bilateral oophorectomy (RR 1.44, 95% CI 1.22-1.68) than those with a hysterectomy and ovarian conservation (RR 1.20, 95% CI 1.06-1.36) (Wilson et al., 2018).
- Women who reported a hysterectomy and ovarian conservation before the age of 50 years were not at increased risk of all-cause mortality compared with women without a hysterectomy, regardless of the use of hormone therapy. However, the risk of premature mortality was higher among women who had undergone a hysterectomy and bilateral oophorectomy before the age of 50 and did not take hormone therapy (HR 1.81, 95% CI 1.01-3.25) (Wilson et al., 2019).
- These findings on chronic diseases lend some support to the position that normal ovaries should not be removed at the time of hysterectomy before age 50, except in women at high inherited risk of ovarian cancer.

9.5 VMS

9.5.1 Background

VMS (hot flushes and night sweats), are the main reason women seek treatment, and drivers of menopause-related health service use.

9.5.2 1946-51 cohort

At each survey, participants were asked how frequently they had experienced hot flushes and night sweats in the last 12 months. The response categories were 'never', 'rarely', 'sometimes', and 'often'. Previous research has identified four symptom profiles of VMS using data from Surveys 1-6, covering ages 45-64 years: early severe (11.2%), late severe (28.9%), moderate (18.2%), and mild (41.7%) (Mishra & Dobson, 2012). The early severe group reported VMS while still premenopausal, and the prevalence of VMS peaked just before menopause or around menopause, followed by a steady decline through postmenopause. The late severe group was characterised with the peak prevalence occurring one to four years into postmenopause, and still experiencing VMS ten or more years after menopause. The moderate group followed a similar symptom pattern as the late severe group but reported a lower prevalence.

Building on previous research (Mishra & Dobson, 2012), VMS were dichotomised as either often present or absent (collapsed never, rarely, and sometimes). As night sweats are associated with sleep disturbances, and our data showed that night sweats were less common than hot flushes, we examined the symptom profiles of hot flushes and nightsweats separately using data from Surveys 1-9, when women were aged 45-73 years. Participants were also asked whether they sought help for VMS at age 45-64 years (in Surveys 1-6), and whether they were satisfied with the help that they received at age 47-58 years (in Surveys 2-4).

Hot flushes

Of the 4,459 women born 1946-51 who reported hot flushes at all nine surveys, 8.4% 'often' experienced hot flushes when aged 45-50 years. This prevalence peaked at age 50-58 years, with almost one in four women reporting hot flushes (Figure 9-6).

When aged 68-73 years, 5.8% of women 'often' experienced hot flushes. Across all nine surveys, nearly half (45.6%) the women born 1946-51 only reported experiencing hot flushes 'sometimes', 'rarely' or 'never'.

A latent class analysis determined five symptom profiles of hot flushes, with the prevalence of hot flushes over time for each symptom profile presented in Figure 9-7. Overall, nearly two-thirds (62.6%) of women born 1946-51 only had minimal hot flushes throughout the survey period (i.e., from ages 45-50 to 68-73 years). The later onset group comprised over 20% of women, characterised by peaked prevalence of hot flushes at age 53-58 years or after, while the majority (17.4%) reported that their hot flushes had ceased by age 62-67 years. 5.9% were still experiencing hot flushes at age 68-73 years. Around 10% of women experienced hot flushes early at age 45-50, with the prevalence peaking at age 47-52 years, followed by a steady decline (early onset group). Finally, the persistent group, consisting of 3.3% of women, experienced hot flushes throughout the survey period.

The baseline demographic and health characteristics associated with the symptom profiles of hot flushes are shown in Table 9-1. Education level, income management difficulty, and cigarette smoking were significantly associated with the symptom groups in the multiple regression analysis (data not shown). Women with no formal qualifications were at higher risk of experiencing all symptom profiles other than minimal hot flushes, and had the highest likelihood of having persistent hot flushes (RRR 5.75, 95% CI 2.81-11.75). Women who reported always having difficulty managing on their available income were also more likely to experience persistent hot flushes (RRR 2.08, 95% CI 1.13-3.83), while current smokers were more likely to experience early onset hot flushes (RRR 1.90, 95% CI 1.35-2.66).

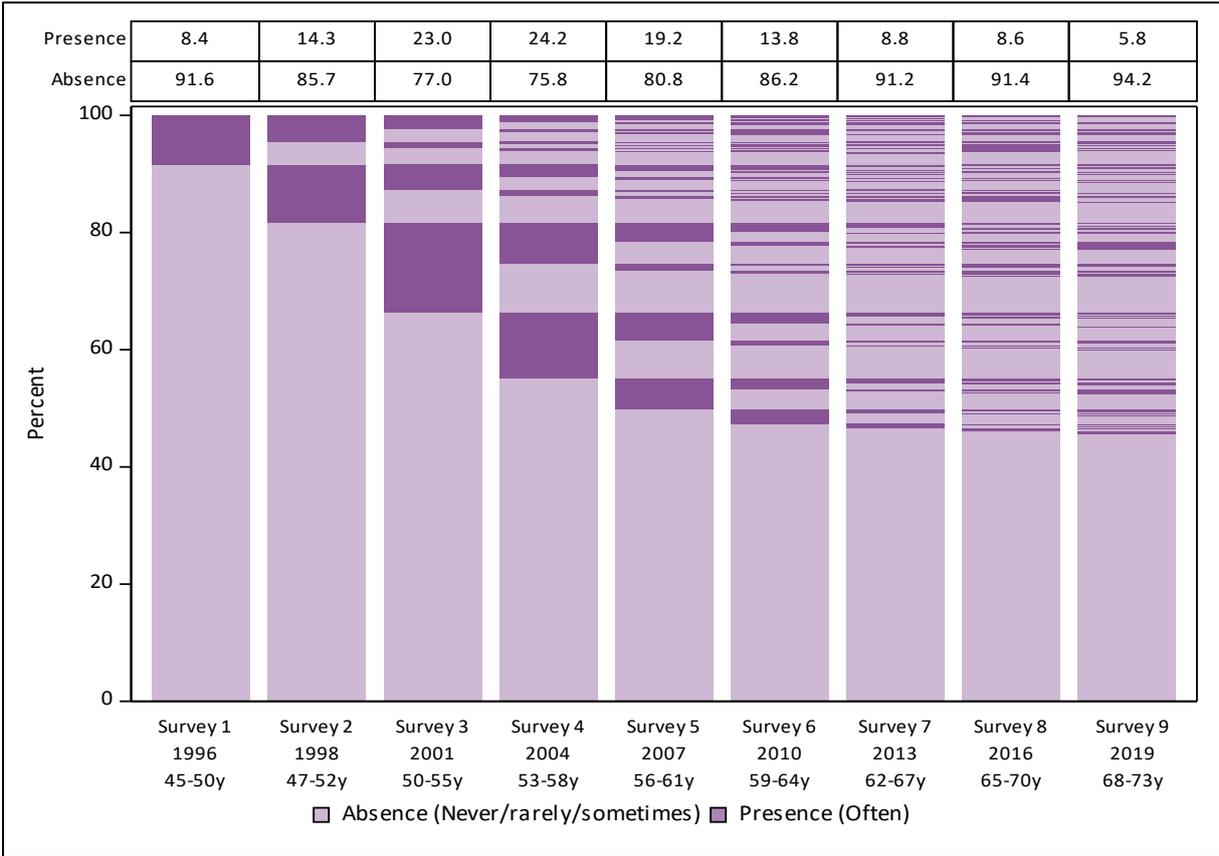


Figure 9-6 Prevalence of hot flushes over time (N = 4,459).

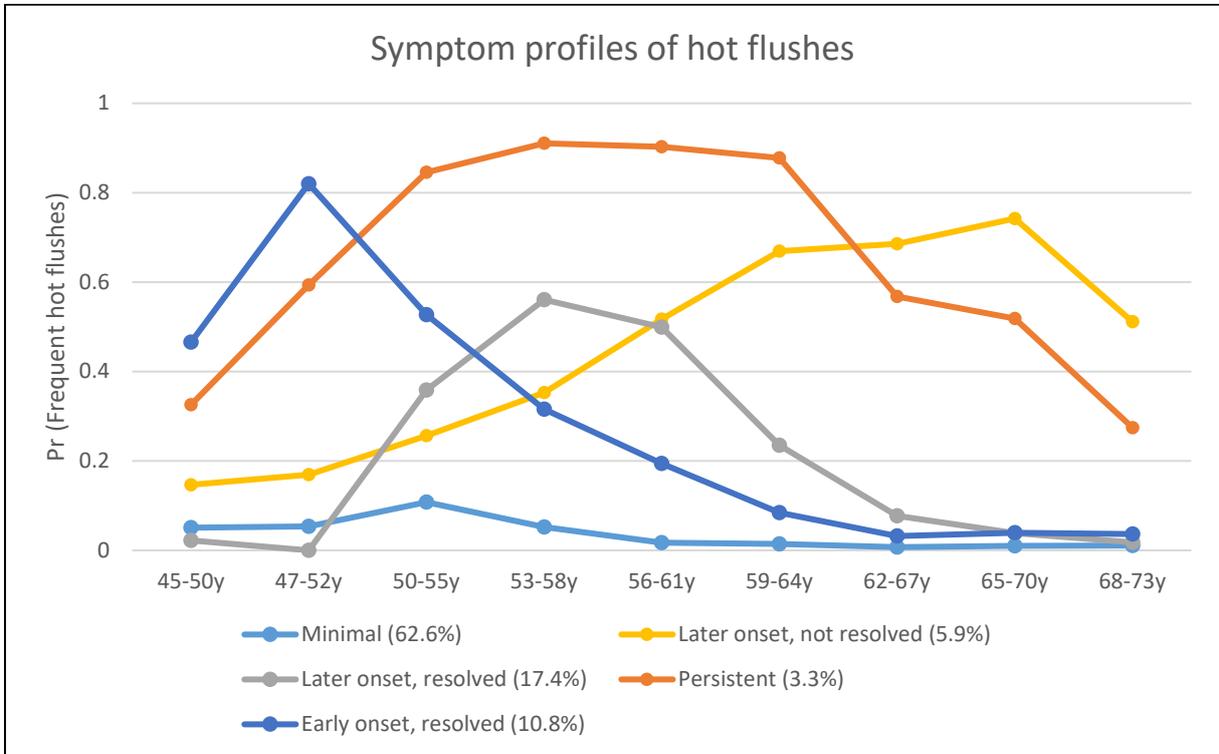


Figure 9-7 Symptom profiles of hot flushes, with the prevalence of hot flushes over time (N = 4,459).

Table 9-1 Baseline demographic and health characteristics associated with the symptom profiles of hot flushes (N = 4,131)

	Minimal hot flushes		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent hot flushes		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
N	2,756		643		331		261		140		4,131	
Survey 1 Education status												
No formal qualification	268	55.6%	82	17.0%	59	12.2%	41	8.5%	32	6.6%	482	11.7%
Year 12 or less	1,309	65.2%	326	16.2%	167	8.3%	137	6.8%	69	3.4%	2,008	48.6%
Trade/Certificate	626	70.7%	127	14.3%	57	6.4%	48	5.4%	28	3.2%	886	21.4%
University degree or higher	553	73.2%	108	14.3%	48	6.4%	35	4.6%	11	1.5%	755	18.3%
Pearson chi2(12) = 68.2 Pr = 0.000												
Survey 1 Area of residence												
Major cities of Australia	989	67.6%	234	16.0%	112	7.7%	82	5.6%	45	3.1%	1,462	35.4%
Inner regional Australia	1,093	65.4%	249	14.9%	151	9.0%	116	6.9%	63	3.8%	1,672	40.5%
Outer regional Australia	539	67.7%	126	15.8%	53	6.7%	52	6.5%	26	3.3%	796	19.3%
Remote Australia	135	67.2%	34	16.9%	15	7.5%	11	5.5%	6	3.0%	201	4.9%
Pearson chi2(12) = 9.7 Pr = 0.641												

	Minimal hot flushes		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent hot flushes		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %

Survey 1 Marital status

Married/De facto	2,357	66.7%	555	15.7%	282	8.0%	222	6.3%	119	3.4%	3,535	85.6%
Separated/Divorced	259	65.4%	57	14.4%	32	8.1%	32	8.1%	16	4.0%	396	9.6%
Widowed	52	64.2%	19	23.5%	6	7.4%	1	1.2%	3	3.7%	81	2.0%
Single	88	73.9%	12	10.1%	11	9.2%	6	5.0%	2	1.7%	119	2.9%

Pearson $\chi^2(12) = 14.4$ Pr = 0.274

Survey 1 Income difficulty

Easy	541	70.8%	107	14.0%	48	6.3%	46	6.0%	22	2.9%	764	18.5%
Not too bad	1,230	67.7%	286	15.7%	144	7.9%	109	6.0%	49	2.7%	1,818	44.0%
Difficult some of the time	702	64.9%	173	16.0%	91	8.4%	73	6.7%	43	4.0%	1,082	26.2%
Difficult all the time/impossible	283	60.6%	77	16.5%	48	10.3%	33	7.1%	26	5.6%	467	11.3%

Pearson $\chi^2(12) = 24.9$ Pr = 0.015

	Minimal hot flushes		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent hot flushes		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
Survey 1 BMI category (WHO)												
Healthy weight, <18.5 kg/m ²	1,567	66.7%	366	15.6%	171	7.3%	160	6.8%	85	3.6%	2,349	56.9%
Overweight, 25 to 29.9 kg/m ²	769	67.6%	172	15.1%	104	9.1%	59	5.2%	34	3.0%	1,138	27.5%
Obese, ≥30 kg/m ²	420	65.2%	105	16.3%	56	8.7%	42	6.5%	21	3.3%	644	15.6%
arson chi2(8) = 8.7 Pr = 0.371												
Survey 1 Smoking status												
Non-smoker	1,659	68.5%	363	15.0%	156	6.4%	151	6.2%	93	3.8%	2,422	58.6%
Ex-smoker	797	65.6%	200	16.5%	118	9.7%	67	5.5%	33	2.7%	1,215	29.4%
Current smoker	300	60.7%	80	16.2%	57	11.5%	43	8.7%	14	2.8%	494	12.0%
Pearson chi2(8) = 34.1 Pr = 0.000												
Survey 1 Alcohol status (NHMRC)												
Non-drinker	334	64.9%	72	14.0%	52	10.1%	32	6.2%	25	4.9%	515	12.5%
Rarely drinks	778	67.0%	182	15.7%	90	7.7%	72	6.2%	40	3.4%	1,162	28.1%

	Minimal hot flushes		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent hot flushes		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
Low risk drinker	1,508	66.9%	370	16.4%	164	7.3%	141	6.3%	70	3.1%	2,253	54.5%
Risky/high risk drinker	136	67.7%	19	9.5%	25	12.4%	16	8.0%	5	2.5%	201	4.9%
Pearson chi2(12) = 21.6 Pr = 0.043												

Seeking help for hot flushes

Among women born 1946-51 who 'often' experienced hot flushes, almost three in four women sought help at age 45-50 years, and the proportion of those who sought help decreased over time to around 25% at age 59-64 years (Figure 9-8). Participants were also asked whether they were satisfied with the help they had received. Among those who 'often' experienced hot flushes and sought help, 20-25% reported not being satisfied with that help at age 47-58 years (Surveys 2-4).

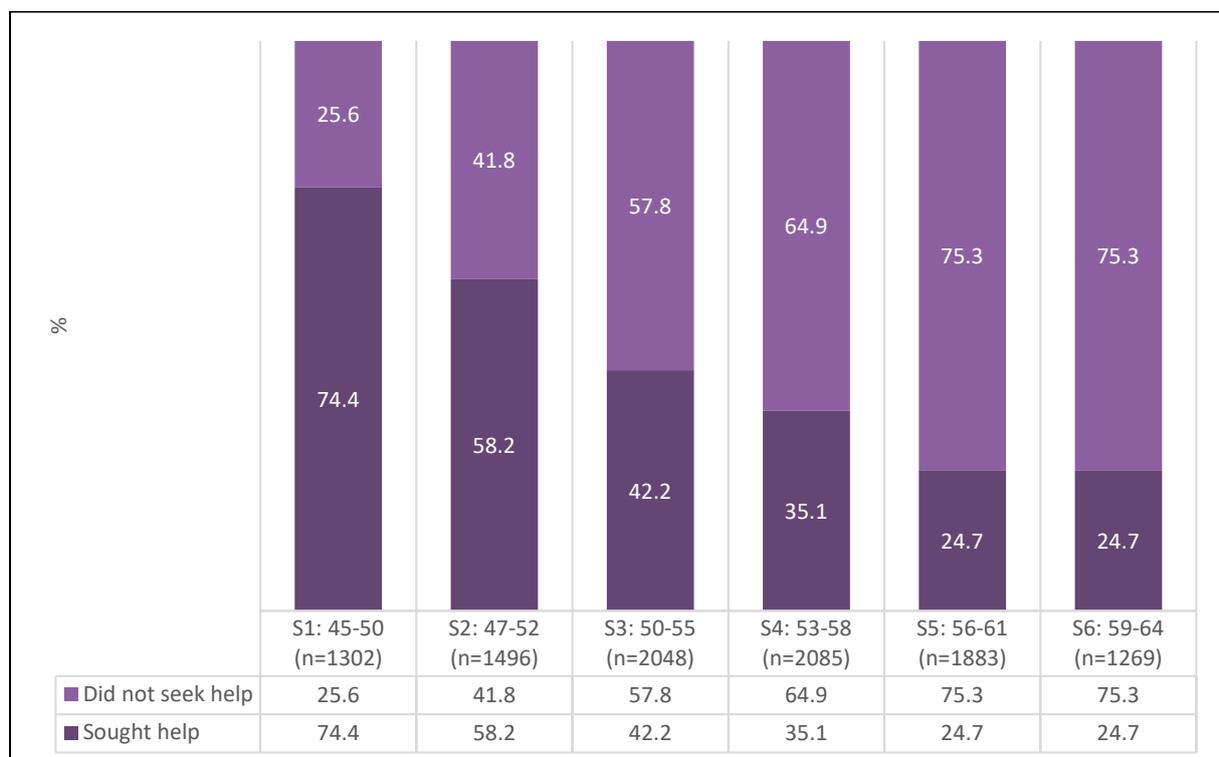


Figure 9-8 Seeking help among women who experienced hot flushes often.

Night sweats

Similar to hot flushes, the prevalence of night sweats peaked at age 50-58 years, but it was lower than that of hot flushes (16.9% vs 24.2%)(Figure 9-9). When aged 68-73 years, 4.1% of women still 'often' experienced night sweats. Across all nine surveys, more than half (57.6%) of women only reported experiencing night sweats 'sometimes', 'rarely', or 'never'.

The five symptom profiles of night sweats are presented in Figure 9-10, with the prevalence of night sweats over time for each symptom profile presented. Over 70% of women reported only having minimal night sweats throughout the survey period. The later onset group comprised over 15% of women, characterised by peaked prevalence of night sweats at age 53-58 years or after, while the majority (11.9%) ceased experiencing night sweats by age 62-67 years. 4.6% were still experiencing night sweats at age 68-73 years. Around 8% of women experienced night sweats early at age 45-50, with the peak prevalence at age 47-52 years (early onset group). Finally, 3% of women reported persistent night sweats across surveys.

The baseline demographic and health characteristics of the women by symptom profiles of night sweats are presented in Table 9-2. In the multiple regression analysis, education level, income management difficulty, cigarette smoking, and BMI were the main factors associated with night sweats. Similar to hot flushes, women who did not have formal qualifications were at higher risk of experiencing all symptom profiles other than minimal night sweats, and had the highest likelihood of having early onset night sweats (RRR 4.06, 95% CI 2.31-7.12). Women who were in the obese category (RRR 1.54, 95% CI 1.06-2.23) and women who currently smoked (RRR 1.81, 95% CI 1.21-2.71) were also more likely to experience early onset night sweats. Women who currently smoked were twice (95% CI 1.35-3.20) as likely to have persistent night sweats. Women who reported they always had difficulty managing on their available income were more likely to experience later onset night sweats.

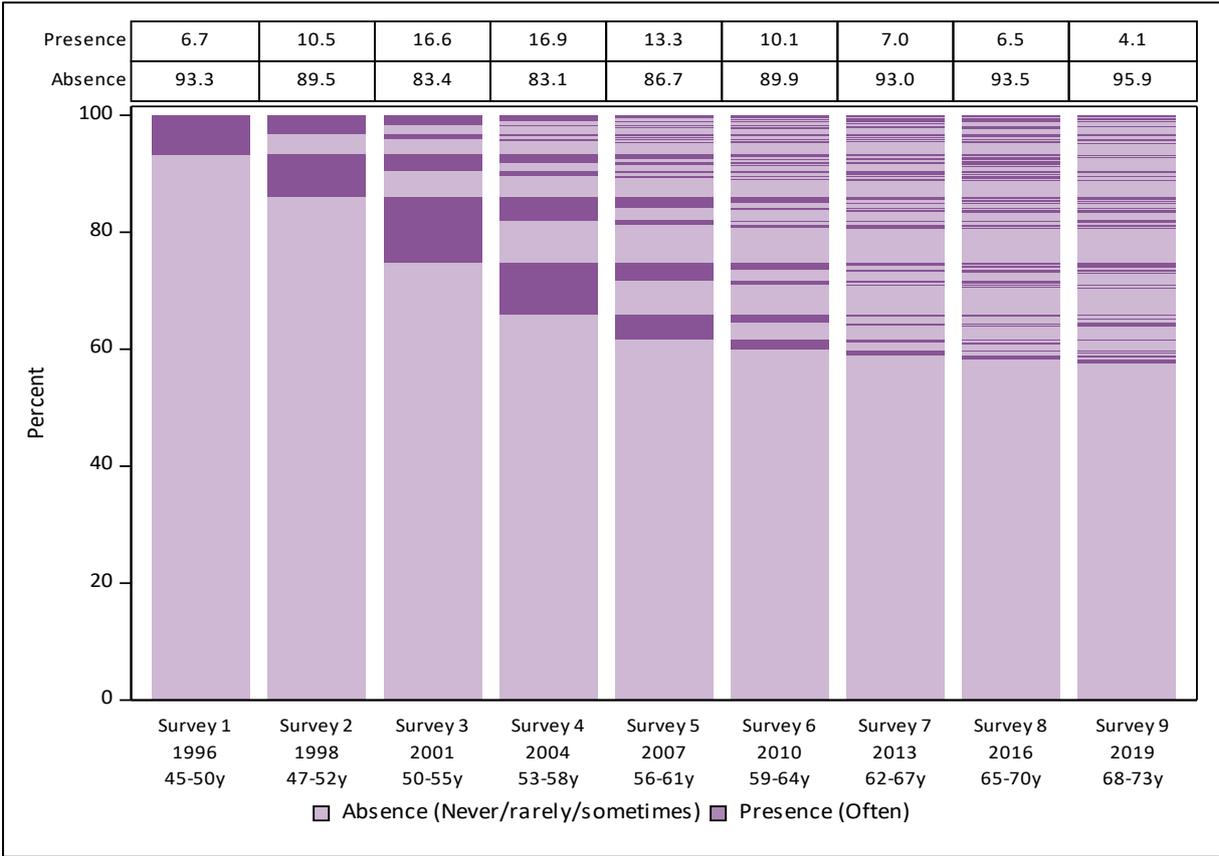


Figure 9-9 Prevalence of night sweats over time (N = 4,085).

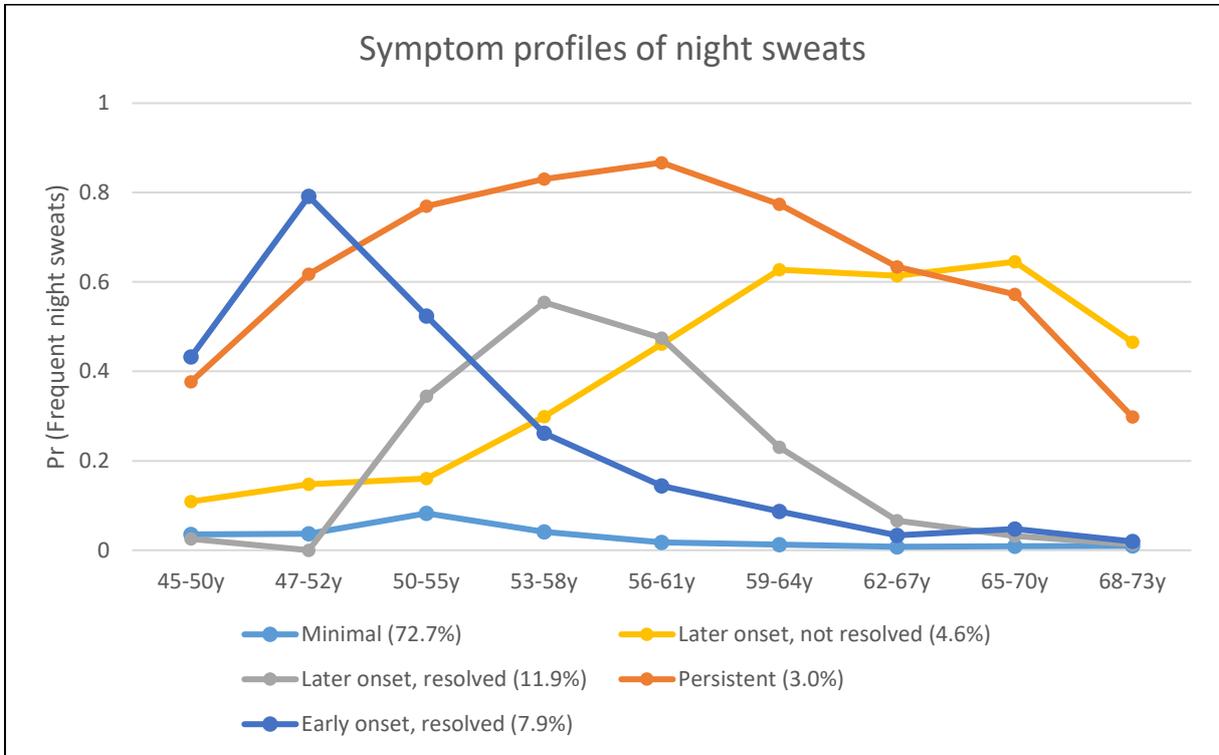


Figure 9-10 Symptom profiles of night sweats, with the prevalence of night sweats over time (N = 4,085).

Table 9-2 Baseline demographic and health characteristics associated with the symptom profiles of night sweats (N = 3,775)

	Minimal night sweats		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent night sweats		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
N	2,909		389		203		167		107		3,775	
Survey 1 Education status												
No formal qualification	282	65.0%	55	12.7%	44	10.1%	25	5.8%	28	6.5%	434	11.5%
Year 12 or less	1,394	76.2%	199	10.9%	95	5.2%	88	4.8%	54	3.0%	1,830	48.5%
Trade/Certificate	650	80.6%	74	9.2%	44	5.5%	27	3.3%	11	1.4%	806	21.4%
University degree or higher	583	82.7%	61	8.7%	20	2.8%	27	3.8%	14	2.0%	705	18.7%
Pearson chi2(12) = 78.4 Pr = 0.000												
Survey 1 Area of residence												
Major cities of Australia	1,033	76.9%	145	10.8%	77	5.7%	50	3.7%	38	2.8%	1,343	35.6%
Inner regional Australia	1,186	77.6%	146	9.5%	81	5.3%	72	4.7%	44	2.9%	1,529	40.5%
Outer regional Australia	545	76.2%	78	10.9%	37	5.2%	37	5.2%	18	2.5%	715	18.9%
Remote Australia	145	77.1%	20	10.6%	8	4.3%	8	4.3%	7	3.7%	188	5.0%
Pearson chi2(12) = 5.9 Pr = 0.923												

	Minimal night sweats		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent night sweats		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %

Survey 1 Marital status

Married/Defacto	2,488	76.7%	344	10.6%	175	5.4%	142	4.4%	94	2.9%	3,243	85.9%
Separated/Divorced	273	78.0%	28	8.0%	17	4.9%	21	6.0%	11	3.1%	350	9.3%
Widowed	60	81.1%	9	12.2%	3	4.1%	2	2.7%	0	0.0%	74	2.0%
Single	88	81.5%	8	7.4%	8	7.4%	2	1.9%	2	1.9%	108	2.9%

Pearson chi2(12) = 11.7 Pr = 0.470

Survey 1 Income difficulty

Easy	565	80.8%	63	9.0%	28	4.0%	27	3.9%	16	2.3%	699	18.5%
Not too bad	1,290	78.1%	159	9.6%	94	5.7%	74	4.5%	34	2.1%	1,651	43.7%
Difficult some of the time	752	75.3%	117	11.7%	51	5.1%	43	4.3%	36	3.6%	999	26.5%
Difficult all the time/impossible	302	70.9%	50	11.7%	30	7.0%	23	5.4%	21	4.9%	426	11.3%

Pearson chi2(12) = 28.1 Pr = 0.005

	Minimal night sweats		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent night sweats		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
Survey 1 BMI category (WHO)												
Healthy weight, <18.5 kg/m ²	1,672	77.4%	218	10.1%	102	4.7%	105	4.9%	64	3.0%	2,104	55.7%
Overweight, 25 to 29.9 kg/m ²	791	77.7%	112	11.0%	54	5.3%	34	3.3%	27	2.7%	1,018	27.0%
Obese, ≥30 kg/m ²	446	74.8%	59	9.9%	47	7.9%	28	4.7%	16	2.7%	596	15.8%
Pearson chi2(8) = 13.9 Pr = 0.085												
Survey 1 Smoking status												
Non-smoker	1,738	78.7%	226	10.2%	103	4.7%	82	3.7%	60	2.7%	2,209	58.5%
Ex-smoker	847	77.1%	107	9.7%	62	5.6%	50	4.6%	32	2.9%	1,098	29.1%
Current smoker	324	69.2%	56	12.0%	38	8.1%	35	7.5%	15	3.2%	468	12.4%
Pearson chi2(8) = 27.7 Pr = 0.001												
Survey 1 Alcohol status (NHMRC)												
Non-drinker	350	74.8%	46	9.8%	33	7.1%	23	4.9%	16	3.4%	468	12.4%
Rarely drinks	787	76.1%	115	11.1%	60	5.8%	43	4.2%	29	2.8%	1,034	27.4%

	Minimal night sweats		Later onset, resolved		Early onset, resolved		Later onset, not resolved		Persistent night sweats		Total	
	n	row %	n	row %	n	row %	n	row %	n	row %	n	col %
Low risk drinker	1,634	78.6%	208	10.0%	96	4.6%	87	4.2%	55	2.6%	2,080	55.1%
Risky/high risk drinker	138	71.5%	20	10.4%	14	7.3%	14	7.3%	7	3.6%	193	5.1%
Pearson chi2(12) = 14.5 Pr = 0.269												

Seeking help for night sweats

Similar to hot flushes, of women born 1946-51 who 'often' experienced night sweats, almost three in four women sought help when aged 45-50 years, and the proportion of women who sought help decreased over time to 24% at age 59-64 years (Figure 9-11). Among the women who 'often' experienced night sweats and sought help, 20-30% reported not being satisfied with that help at Surveys 2 to 4, when aged 47-58 years.

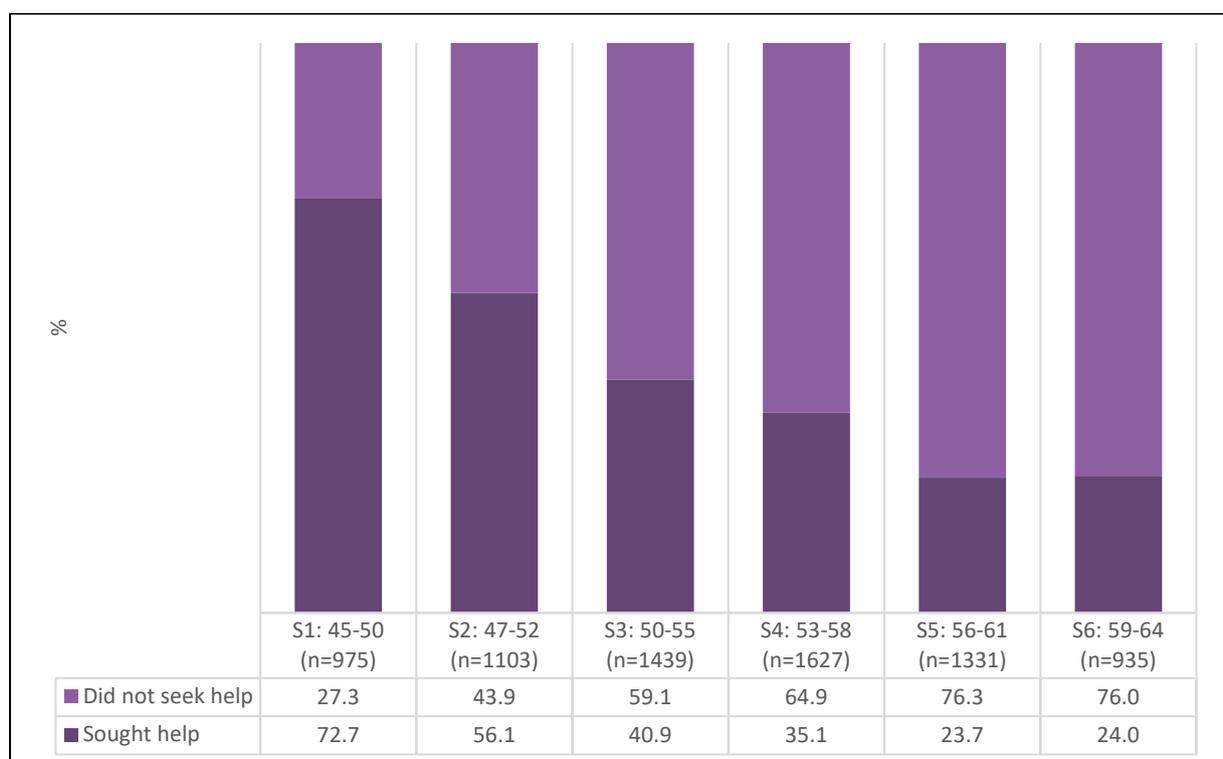


Figure 9-11 Seeking help among women who experienced night sweats often.

9.5.3 1973-78 cohort

Hot flushes

Of women who completed both Surveys 7 and 8 (aged 37-45 years; N = 6,158), less than 3% reported that they 'often' experienced hot flushes. Although the prevalence was steady between the surveys (Survey 7: 1.5%; Survey 8: 2.3%), help-seeking

among those who ‘often’ experienced hot flushes rose from 30.7% in Survey 7 to 41.3% in Survey 8 (Figure 9-12).

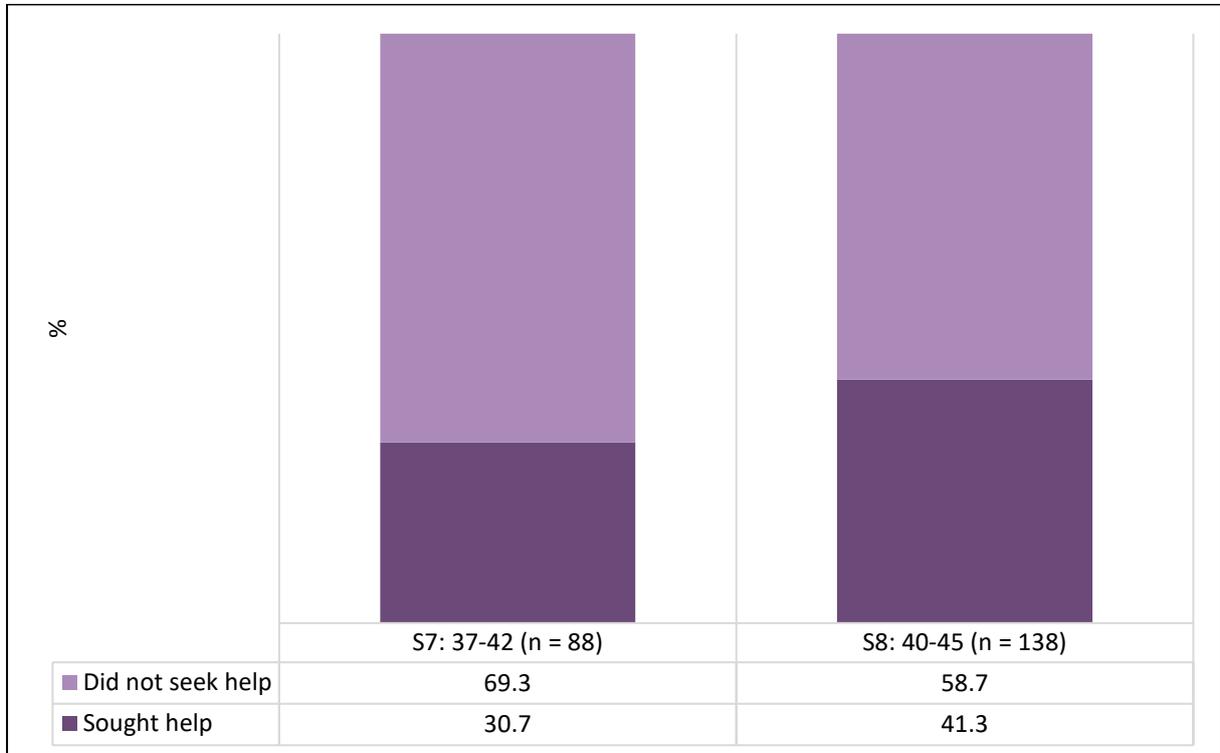


Figure 9-12 Seeking help among women who experienced hot flushes often.

Night sweats

The prevalence of night sweats was similar to that of hot flushes. Of women who completed both Surveys 7 and 8 (aged 37-45 years), only 3% or fewer reported that they ‘often’ experienced night sweats (Survey 7: 2.1%; Survey 8: 2.7%). Help-seeking among those who ‘often’ experienced night sweats was similar at both surveys, at approximately 31% (Figure 9-13).

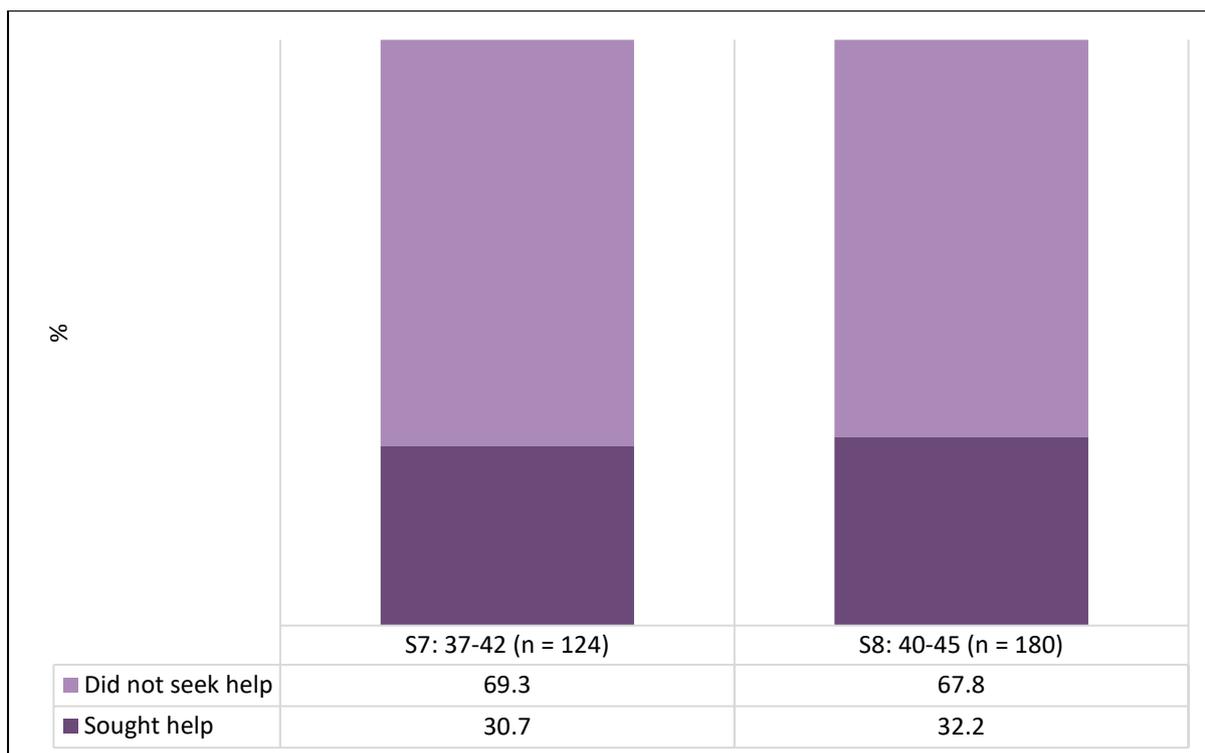


Figure 9-13 Seeking help among women who experienced night sweats often.

9.5.4 Previous research: predictors of vasomotor symptoms

Although menopause-related hormonal changes are associated primarily with VMS, previous ALSWH and InterLACE studies have shown that certain lifestyle factors (Anderson et al., 2020) and diet (Dunneram et al., 2019; Herber-Gast & Mishra 2013) were also associated with the frequency and severity of VMS.

- Obesity was associated with a 60% (95% CI 1.41-1.78) increased risk of experiencing often/severe VMS, compared with normal weight. Women who smoked were 80% (95% CI 1.45-2.30) more likely to experience often/severe VMS, compared with women who never smoked (Anderson et al., 2020).
- Women who quit smoking before 40 years had a similar level of risk of VMS as those who had never smoked (Anderson et al., 2020).
- Frequent (daily or weekly) consumption of soy products (OR 0.63, 95% CI 0.45-0.89) but not soy milk (OR 1.11, 95% CI 0.85-1.45) was associated with a lower likelihood of reporting subsequent VMS (Dunneram et al., 2019).

- A higher consumption of fruit (OR 0.81, 95% CI 0.71-0.93) or a Mediterranean diet (OR 0.80, 95% CI 0.69-0.92) were both associated with a decreased risk of reporting VMS, whereas a high fat and high sugar diet was associated with an increased risk of reporting VMS (OR 1.23, 95% CI 1.05-1.44), when comparing the top 20% with the bottom 20% of dietary intakes (Herber-Gast & Mishra, 2013).

9.5.5 Previous research: VMS and risk of chronic conditions

- Greater severity of VMS, rather than frequency, was associated with a higher risk of CVD. Women who reported experiencing both hot flushes and night sweats had a higher risk of CVD (HR 1.55, 95% CI 1.24-1.94) than those with hot flushes alone (HR 1.33, 95% CI 0.94-1.88) or night sweats alone (HR 1.32, 95% CI 0.84-2.07) (Zhu et al., 2020b).
- Compared with women without VMS, those with either early onset (before menopause) or late onset VMS (after menopause) had an increased risk of CVD, with a slightly higher risk in the late onset group (HR 1.69, 95% CI 1.32-2.16) than in the early onset group (HR 1.38, 95% CI 1.10-1.75) (Zhu et al., 2020b).
- Women who experienced often/severe VMS were more likely to have concurrent (OR 2.59, 95% CI 2.35-2.85) and subsequent depressed mood (OR 1.56, 95% CI 1.27-1.92), compared with those without VMS. This association may be largely explained by sleeping difficulties (Chung et al., 2018).

9.6 MHT

9.6.1 1946-51 cohort

At each survey, participants were asked whether they were currently undergoing MHT. The use of MHT peaked at age 50-55 (Survey 3 in 2001), with one third (32.6%) of women taking MHT (Figure 9-14). When aged 68-73 years, 7.3% of women were still taking MHT. Half (50.6%) of women did not take MHT throughout the survey period.

Among women who were taking MHT at age 45-50, more than half (52.4%) reported a hysterectomy and/or bilateral oophorectomy.

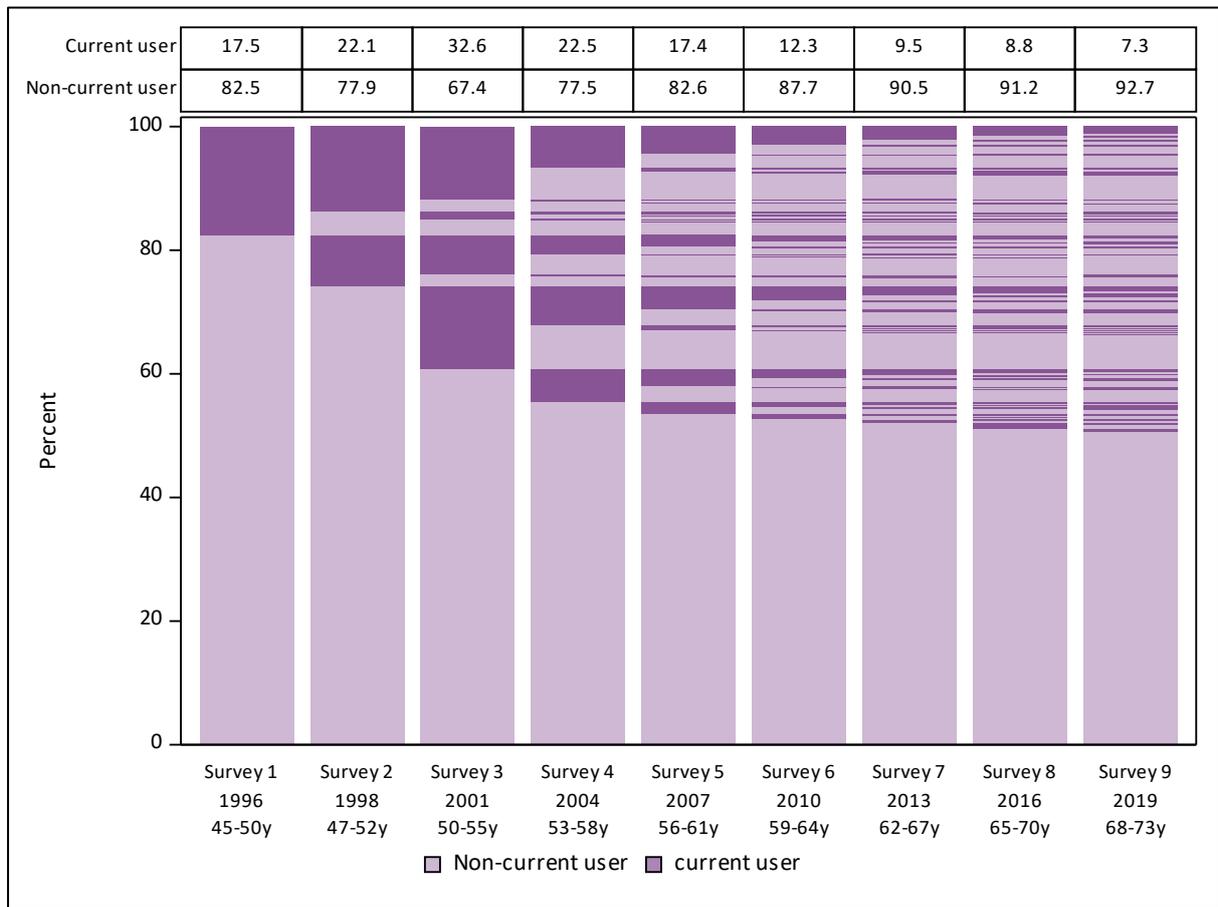


Figure 9-14 Use of MHT over time (N = 6,021).

9.6.2 1973-78 cohort

At Survey 8, when aged 40-45 years, only 1.4% (N = 102) of women born 1973-78 reported they were currently taking MHT. Of these, 40.2% (N = 41) reported a hysterectomy and/or bilateral oophorectomy. Of those who reported ‘often’ experiencing hot flushes, 11.9% (N = 20) were taking MHT, and of those who reported ‘often’ experiencing night sweats, 7.8% (N = 17) were taking MHT.

9.7 Conclusion

These findings provide robust evidence that an earlier age at menopause (<45 years) and surgical menopause (bilateral oophorectomy) are associated with adverse health outcomes in later life, especially CVD. Hot flushes and night sweats were also linked to CVD. Women with early menopause, having had a hysterectomy and/or oophorectomy, and experiencing frequent/severe vasomotor symptoms need early screening tests (e.g., blood pressure, lipids, blood glucose) for monitoring cardiovascular health before age 60. Age and type of menopause should be considered as an important factor when assessing CVD risk for women. Removal of normal ovaries at the time of hysterectomy should not be recommended before age 50, except in women at high inherited risk of ovarian cancer.

Some modifiable lifestyle factors may reduce the risk of early menopause and mitigate vasomotor symptoms. Maintaining a normal weight before the menopausal transition and quitting smoking early, preferably before the age of 30, may mitigate the excess risk of early menopause and vasomotor symptoms.

9.8 References

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10. FAMILY PLANNING AND USE OF CONTRACEPTIVES DURING THE COVID-19 PANDEMIC

Authors: Natalie Townsend, Peta Forder, Emma Byrnes, Isabelle Barnes, Deborah Loxton

10.1 Key messages

Quantitative findings

- 10% of women aged 25-31 years changed their pregnancy plans during the pandemic, compared to less than 1% of women aged 42-47 years.
- 11% of women aged 25-31 years were either pregnant or trying to fall pregnant, compared to 2% of women aged 42-47 years.
- 14% of women aged 25-31 years and 3% of women aged 42-27 years indicated that their contraception use had changed since the pandemic began.
- Very few women reported difficulties in accessing contraception during the pandemic.

Qualitative findings

- The pandemic introduced challenges in accessing reproductive health services and adhering to regular contraceptive methods.
- Women described changes to sexual activity during the pandemic, such as having limited opportunities for sexual activity, or a reduced interest in sex.
- Women wrote of limited maternal health service use, economic instability, additional stress, and uncertainty as reasons contributing to their change of mind on pregnancy and having children.

10.2 ALSWH fortnightly COVID-19 pandemic surveys

As with the rest of the population, the women in the ALSWH have never lived through anything like the COVID-19 pandemic. To capture this moment in time, a series of short fortnightly online surveys was deployed via email to women in the three younger ALSWH cohorts (born 1989-95, 1973-78, and 1946-51), with the first survey sent out in April 2020. The purpose of these surveys was to learn about the women's experiences during the pandemic. These surveys were designed to be brief and succinct, with the online surveys taking 1-2 minutes to complete.

Each fortnight, the same questions were asked concerning COVID-19 symptoms, testing, general health, and stress. Brief questions on specific topics were also included, with the topics changing each fortnight. At the tenth COVID-19 survey (2-15 September 2020), women from the two youngest cohorts (aged 25-31 years and 42-47 years) were asked about the impact of the pandemic on their plans for pregnancy and about contraceptive use during the pandemic. The following two sections present summary findings from this survey. COVID-19 Survey 10 also invited women to write about their concerns or experiences during the pandemic. After identifying those free text responses that were pertinent to family planning, a qualitative analysis was undertaken, the results of which are presented in Section 10.5.

10.3 Pregnancy plans during the COVID-19 pandemic

Around 10% of women aged 25-31 indicated that their plans for pregnancy had changed since the pandemic started, with 6% delaying pregnancy and 4% planning to become pregnant sooner than they had planned prior to the pandemic. Less than 1% of women aged 42-47 reported changing their plans for pregnancy since the pandemic started (Table 10-1).

Around 11% of women aged 25-31 and 2% of women aged 42-47 were either pregnant or trying to fall pregnant at the time of the survey.

Table 10-1 Pregnancy intentions since the COVID-19 pandemic started and current pregnancy status among women aged 25-31 years and 42-47 years

	Aged 25-31 (N = 1,972)		Aged 42-47 (N = 2,253)	
	N	%	N	%
Have your plans for pregnancy changed since the COVID-19 crisis began? (Mark one only)				
No, my plans have not changed	1,698	86.11	2,169	96.27
Yes, I plan to have a child later than I had planned prior to COVID-19	125	6.34	9	0.40
Yes, I plan to have a child sooner than I had planned prior to COVID-19	79	4.01	3	0.13
Other	66	3.35	63	2.80
Missing	4	0.20	9	0.40
Are you currently pregnant or trying to get pregnant? (Mark one only)				
Yes, I am currently pregnant	117	5.93	7	0.31
Yes, I am trying to get pregnant	98	4.97	31	1.38
No	1,750	88.74	2,207	97.96
Missing	7	0.35	8	0.36

Since the start of the COVID-19 crisis, reported pregnancy intentions were similar for women aged 25-31 years who had either a university qualification, a trade certificate or equivalent, or who had completed Year 12 or less, with 85-88% of women born 1989-95 indicating that their pregnancy intentions were unchanged during the pandemic (Figure 10-1). Pregnancy intentions were similar for women who lived in major cities versus women who lived in regional and remote areas. Women aged 25-31 who indicated that their available income was manageable were more likely to report that they planned to have children earlier than they originally planned when compared to women who found it difficult or impossible to manage on their available income (5.0% versus 2.1%, respectively).

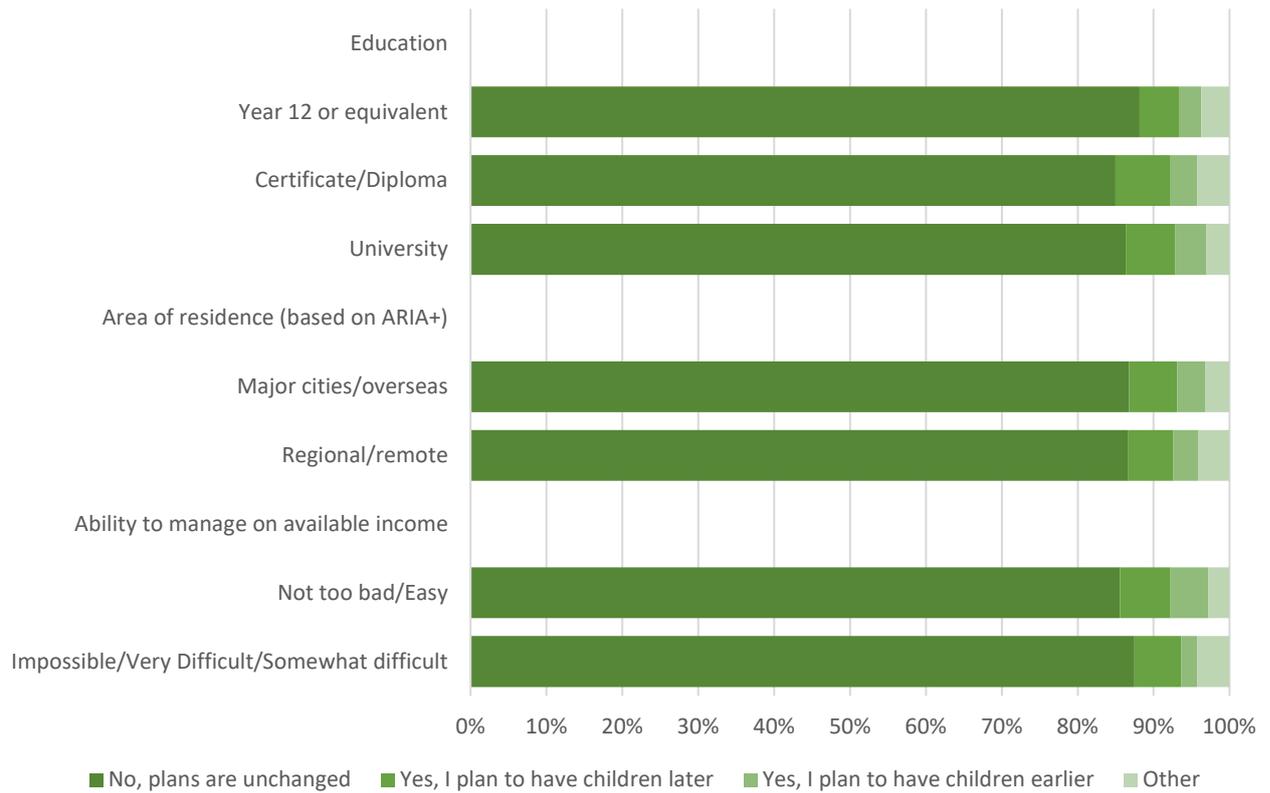


Figure 10-1 Pregnancy intentions since the COVID-19 pandemic started, among women aged 25-31 years, according to socio-demographic factors at most recent main survey.

Six months into the COVID-19 pandemic, 6.4% of women aged 25-31 with a university qualification had reported being currently pregnant, compared to 4.9% of women with a trade certificate or equivalent and 3.0% of women who had completed Year 12 or less (Figure 10-2). A higher proportion of current pregnancies were reported by women living in regional and remote areas, compared to women living in major cities (8.5% versus 5.6%). Women aged 25-31 who managed on their income were also more likely to report currently being pregnant during the pandemic (7.1%) than women who reported that their available income was not manageable (3.8%).

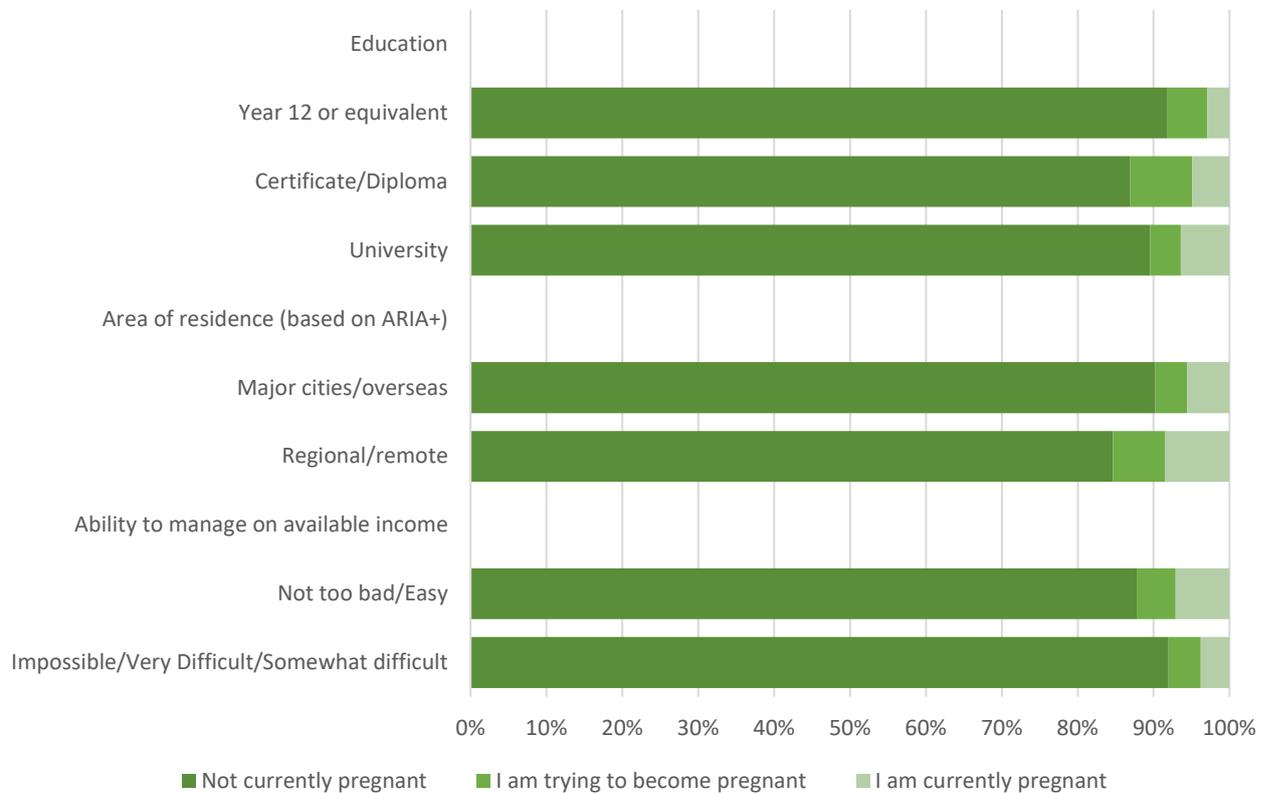


Figure 10-2 Current pregnancy status among women aged 25-31 years, according to socio-demographic factors at most recent main survey.

Only 12 women (0.5%) aged 42-47 years reported changing their pregnancy plans, and less than 40 women (1.6%) indicated that they were currently pregnant or trying to become pregnant at the COVID-19 Survey 10. As a result of these low numbers, no detailed examination of socio-demographic factors for women aged 42-47 was conducted.

10.4 Contraceptive use during the COVID-19 pandemic

10.4.1 Change in contraception use

Among women aged 25-31 years, 14% indicated that their contraception use had changed since the pandemic began, with 6% indicating that they no longer used contraception and 8% indicating that they had changed their contraception method. Among women aged 42-47, the majority of women indicated that their contraception use had not changed since the pandemic started, with only 3% indicating that their contraception use had changed, including 1% who indicated that they no longer use contraception and 2% who indicated that they had changed contraception.

Table 10-2 Change in contraception use during the COVID-19 pandemic (at September 2020) for women aged 25-31 and 42-47 years

Has your contraception use changed since the COVID-19 crisis began? (Mark one only)	Aged 25-31 (N = 1,972)		Aged 42-47 (N = 2,253)	
	N	%	N	%
Missing	7	0.35	12	0.53
Yes, I have changed the contraception I use	159	8.06	50	2.22
Yes, I have stopped using contraception	122	6.19	22	0.98
No, the method of contraception I use has not changed	1,300	65.92	1,186	52.64
No, I still do not use contraception	384	19.47	983	43.63

10.4.2 Type of contraceptives used during the COVID-19 pandemic

Women were asked about their use of 13 types of contraceptive methods during the COVID-19 pandemic, which were classified into the following groups (Harris et al; 2020):

- short-acting contraceptives (i.e., the combined OCP, the progesterone only pill, an unknown type of OCP, vaginal ring, and hormone injection);
- condoms;
- emergency contraception;

- LARCs (i.e., contraceptive implant, copper IUD, and progesterone IUD);
- natural methods (i.e., withdrawal method and fertility awareness period method); and
- other (any contraceptive method not listed).

Among women aged 25-31 who indicated that they were not currently pregnant or trying to become pregnant (N = 1,750), short-acting contraceptive methods were the most common contraceptive method used since the beginning of the COVID-19 crisis. Around one in three women (37%) indicated they used this option, which was most commonly the combined OCP, but also included the progesterone-only pill (the 'mini-pill'), the hormonal injection, and the vaginal ring. More than a quarter of women aged 25-31 reported using condoms (28%) and LARC (28%). Natural methods were reported by 16% of women aged 25-31, while 2% reported that they had used emergency contraception since the beginning of the pandemic (Figure 10-3).

Compared to data collected at the last main ALSWH survey of women born 1989-95 (2019), women during the pandemic were less likely to use condoms, more likely to use LARC, and more likely to use no contraception. Overall, the differences were minimal and reflect changes that occurred both within the context of the pandemic and those changes in use that ordinarily occur as time passes.

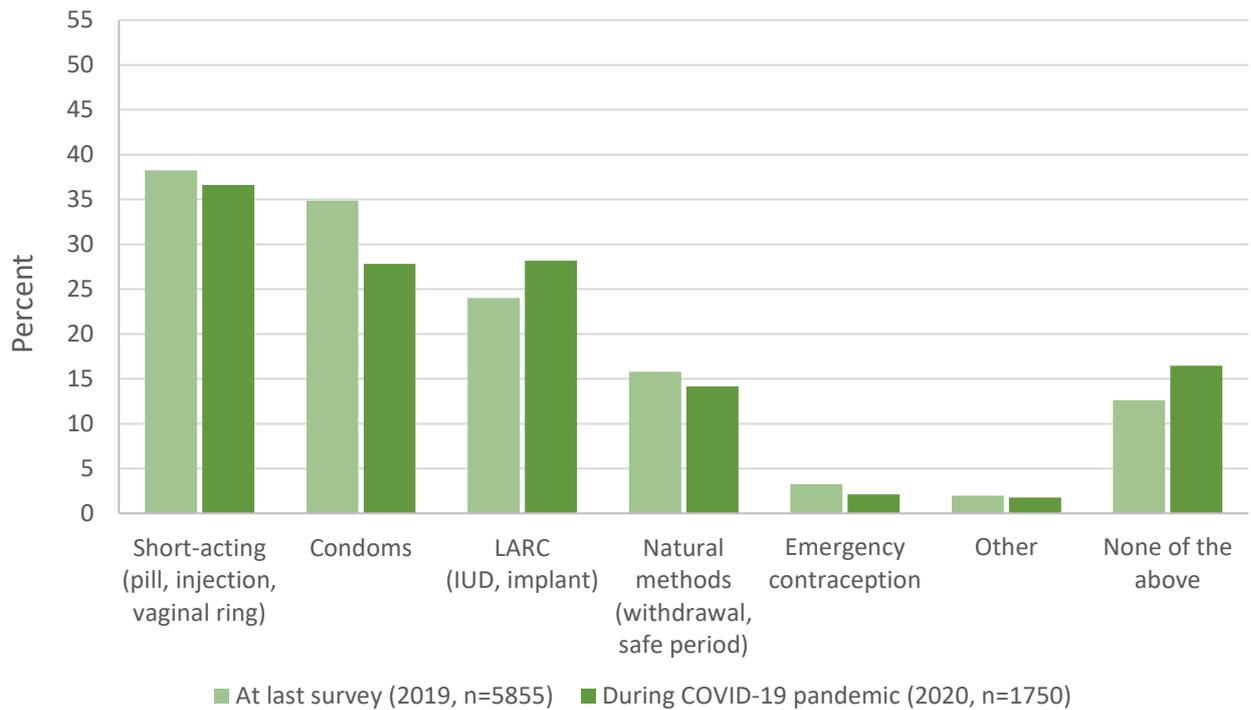


Figure 10-3 Contraceptive methods used among women aged 25-31 years, as reported at last main ALSWH survey (2019) and during the COVID-19 pandemic (at September 2020).

Among women aged 42-47 who indicated that they were not currently pregnant or not trying to become pregnant during the pandemic (N = 2,207), 50% indicated that they were using none of the listed contraceptives (Figure 10-4). The most common contraceptive methods reported include LARC (18%), short-acting methods (12%), and condoms (9%). Less than 1% of women aged 42-47 reported using emergency contraception. During the COVID-19 pandemic, women were less likely to report using condoms (9% versus 15%), and more likely to use no contraception (49% versus 46%), compared to contraceptive methods reported before the pandemic (reported at the last main ALSWH survey in 2018).

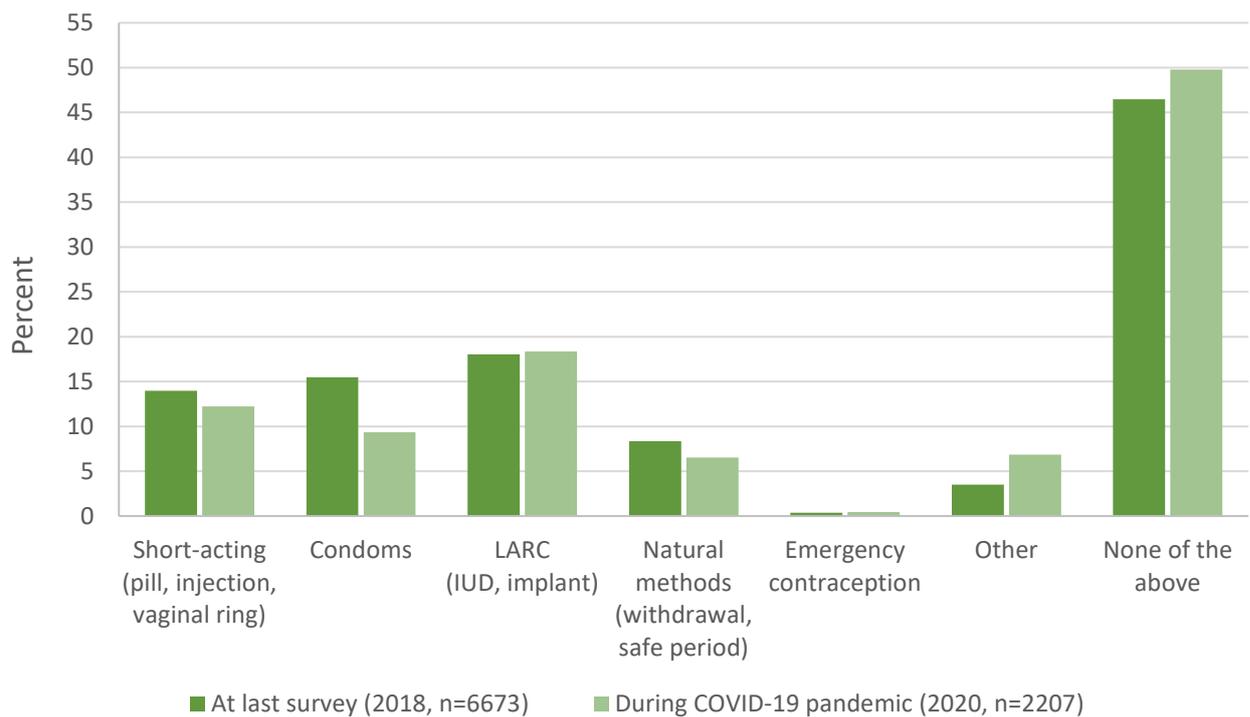


Figure 10-4 Contraceptive methods used among women aged 42-47 years, as reported at last main ALSWH survey (2018) and during the COVID-19 pandemic (at September 2020).

10.4.3 Number of contraceptive methods used during the COVID-19 pandemic

The number of contraceptive methods used differed between cohorts (Figure 10-5), with women aged 25-31 more likely to report using multiple contraceptive methods than women aged 42-47. Among women aged 25-31 who were using contraception, 70% used one type of contraceptive only, 24% used two contraceptive types (condoms were most commonly used with either a short-acting contraceptive like the OCP, or with a LARC), and 6% used three or more types of contraceptives. Among women aged 42-47 who were using contraception, 91% reported using one type of contraceptive only, with 8% using two types, and 1% using three or more types of contraception.

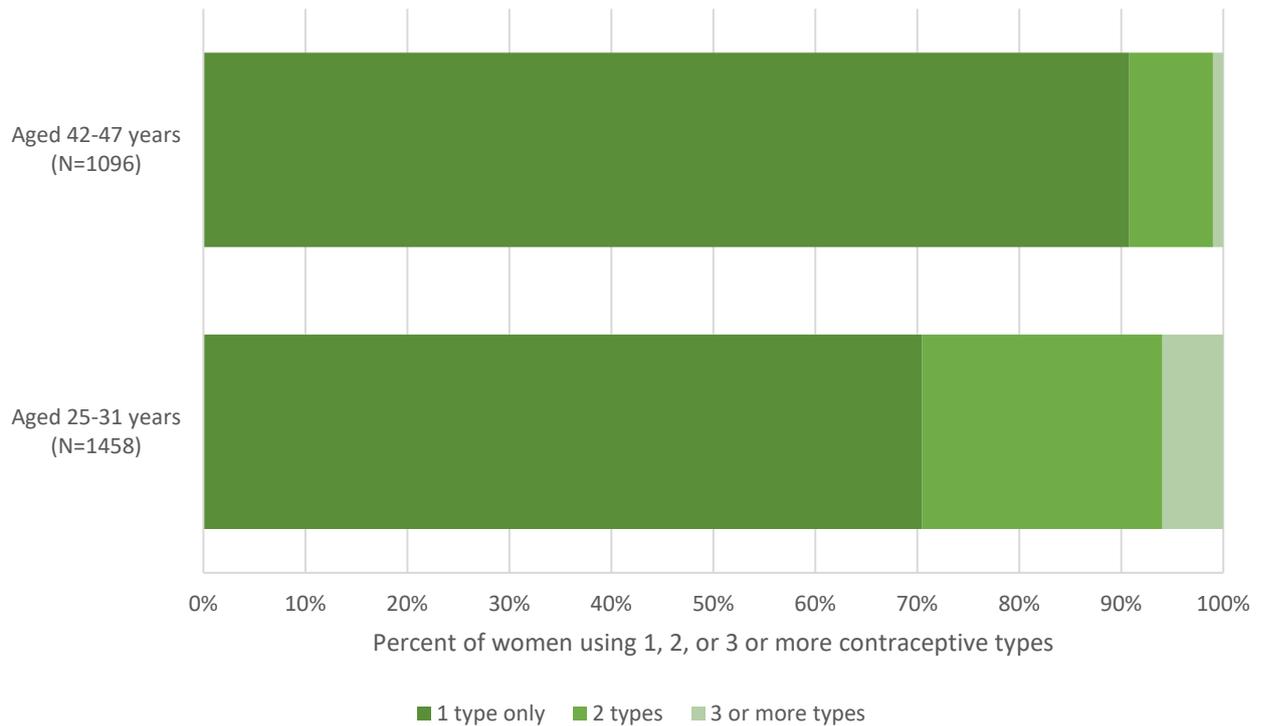


Figure 10-5 Number of contraceptive types used by women during the COVID-19 pandemic (at September 2020), among women aged 25-31 years and 42-47 years.

10.4.4 Difficulties accessing contraception during the COVID-19 pandemic

Among women aged 25-31, 6% reported difficulty accessing contraception, most commonly the OCP (4%) and the progesterone IUD (1%). Of women aged 42-47, 2% reported difficulty accessing contraception, most commonly the OCP (1%). Women elaborated on their experiences in obtaining contraception during the pandemic in the qualitative section of the survey. The results of these data are presented in the next section.

10.5 What women said about the impact of the COVID-19 pandemic on their contraception use, pregnancy plans, and sexual and reproductive health: A qualitative analysis

A total of 328 participants from the 1989-95 and 1973-78 cohorts provided free text comments in the COVID-19 Survey 10. Of the 328 comments, 178 women (39 from the 1989-95 cohort and 139 from the 1973-78 cohort) provided comments about their

sexual and reproductive health. Comments which were not specific to experiences during the COVID-19 pandemic were excluded (e.g. *'My husband had vasectomy years ago'* or *'I have had a hysterectomy so not relevant'*). Therefore, the following qualitative thematic analysis includes comments from 150 participants: 118 women from the 1989-95 cohort and 32 women from the 1973-78 cohort.

Comments were coded using a thematic analysis technique. Thematic analysis, as detailed by Braun & Clarke (2006), is a flexible analysis technique which has successfully been applied to free-text analysis. Thematic analysis involves familiarisation with the data, generation of initial codes, developing themes, reviewing themes, defining and naming themes, and producing the report.

10.5.1 Results

Two major themes were generated from the qualitative analysis. The first of these was practices of contraception use, and reproductive and sexual health. This theme included four subthemes: reproductive and sexual health service use, contraceptive practices, sexual activity, and fertility issues. The second major theme was attitudes and beliefs towards contraception, reproductive and sexual health. This theme included two subthemes: attitudes towards having children, and pregnancy and birth.

Practices

Reproductive and sexual health service use

In adhering to COVID-19 restrictions and social distancing measures, reproductive and sexual health services were offered in a limited capacity during the COVID-19 pandemic. Women noted limited availability of services, as well as self-limiting their use of services. Women from both cohorts discussed difficulty in accessing appointments for sexual health screening, contraception upkeep, and other reproductive health services:

Very hard to get a GP face to face visit for a [Pap] Smear. (1989-95 cohort participant)

Covid has impacted accessibility of maternity and GP services in our small rural town - it has been more difficult to engage with services. (1989-95 cohort participant)

Difficulty in sourcing elective surgery to have Mirena replaced due to limited elective surgery options. (1973-78 cohort participant)

IVF during Covid has another layer of complexity. With the first wave the service was on hold for 2 weeks. Covid adds another layer of stress. (1973-78 cohort participant)

For some women, limited access to reproductive and sexual health services created unintentional consequences, including additional stress and costs, and prolonged pain or side effects:

I use an IUD for managing the symptoms of my endometriosis. Due to COVID-19, I have had to delay the plans I had to go back to my gyno and get my endometriosis removed, so I still live with a considerable amount of pain. (1989-95 cohort participant)

I was still able to access a contraceptive implant but the supplier did change as well as the cost. My appointment with Family Planning was cancelled with no replacement appointment offered. Fortunately my local health centre offered to put in for me instead. The cost difference was about \$150... (1973-78 cohort participant)

Many women spoke of their personal choice to limit their reproductive and sexual health service use during the COVID-19 pandemic, particularly their use of contraceptive and sexual screening services. Adhering to social distancing and lockdown regulations, fear of catching COVID-19, and avoiding the additional barriers and stress in accessing services were some of the reasons women gave for limiting their health service use:

I technically can get my IUD replaced- but the barriers are higher eg more difficult to access appointments, and the risks are greater. I am avoiding it... (1989-95 cohort participant)

I am overdue for a pap test because of Covid/fear of covid. (1973-78 cohort participant)

Throughout the COVID-19 pandemic, many health services offered telehealth appointments (e.g., phone or video calling) as an alternative to face to face appointments. A few women from the 1989-95 cohort commented on the challenges in using telehealth for reproductive and sexual health services:

My GP has not been doing any face to face consults so I haven't been able to have my routine [cervical screening test] (1989-95 cohort participant)

I recently delayed seeking an appointment for a routine Pap smear due to limited availability of face to face appointments. (1989-95 cohort participant)

Contraceptive practices

Women offered insight into the impact of the COVID-19 crisis on the availability of contraception at pharmaceutical dispensaries and the ability to see a healthcare provider for contraceptive health care, in addition to the impact on their own comfort levels in seeking contraceptive health care. All of these factors impacted their contraceptive practices.

A number of women described having difficulty accessing their regular OCP during the COVID-19 crisis, due to a shortage in supply. Some indicated that they had gone without their medication for a period of time:

...The pill I was [supposed] to get is out of stock australia wide and will take a few weeks to get shipped in so am without for a few weeks. (1989-95 cohort participant)

Searching for the oral contraceptive I'd been on for years due to lack of supply was quite stressful. (1989-95 cohort participant)

I prescribe contraception - there is no Norimin and Norimin-1 available in our town and this has caused some trouble for people who suffer significant side effects with other COCPs! (1989-95 cohort participant)

While some women reported going without the OCP, others indicated that they had obtained new prescriptions and were using different pill varieties. One woman highlighted the potential adverse consequences of this, describing the side effects that she had experienced from the different pill. It was also clear that changing from their regular contraceptive pill was stressful for these women, many of whom indicated that they had previously used the same pill for a long time:

Changing contraception due to lack of availability of the pill I was on before has had a massive negative impact. I tried a number of pills before settling on a pill. The pills I initially tried had massive side effects on my mental health. Having to move to another pill thus caused a large amount of stress and anxiety and the new pill has again caused negative side effects and severe anxiety. (1989-95 cohort participant)

Had to get different script as the brand I was on is out of stock until November. That 3 months waiting. I have been using the same brand for over 20 yrs. (1973-78 cohort participant)

Aside from the shortage in supply of contraceptive medications, an additional barrier to accessing contraception was the difficulty in accessing an appointment with a health practitioner during the COVID-19 crisis. Many women indicated a desire to change their contraceptive method, however a lack of available appointments with healthcare providers was a barrier to making this change:

I have commenced a new relationship during COVID -19 and would like to use a method of contraception other than condoms but without easy access to a GP to discuss it with am not sure what would be suitable (I was last on the combined pill approximately 4 years ago). (1978-78 cohort participant)

Before covid I had a referral to get the IUD, but due to restrictions and cancelled appointments I have not had it done, and just staying on the pill. (1989-95 cohort participant)

The difficulty in accessing health services extended to those with hormonal implants and IUDs. There was a large number of women who indicated that they were overdue for the removal or replacement of their implant or IUD. As women explained, this left them at risk of side effects, in addition to a potential unplanned pregnancy. Further, some women indicated that they had been very stressed by this:

GP treatment/procedure room was closed during COVID restrictions and I am overdue for new implanon insertion. (1989-95 cohort participant)

Due to COVID-19 the removal of my mirena was delayed possibly prolonging serious side effects. (1989-95 cohort participant)

I had to get my Mirena replaced during Stage 4 lock down in Melbourne. It was okay and my doctor was great but it definitely had an impact on the process. The last one I got, I had done at a specialist clinic but this time I just went to my doctor because it felt safer. It added a lot of stress to the process having to deal with restrictions on top of an already difficult thing. (1989-95 cohort participant)

Another barrier to accessing contraception was women not wanting to seek contraceptive health care during the COVID-19 crisis. It was clear that many women did not feel comfortable leaving home to see a health care provider during the pandemic and so they limited their own access to services. Self-limiting was

particularly evident for those facing strict lockdown conditions in locations in which high COVID-19 case numbers were recorded. There was also some uncertainty surrounding recommendations to stay at home, as well as whether or not contraceptive procedures were considered elective:

I am due for a change of my Mirena IUD but I don't feel comfortable doing this during stage 4 restrictions in Melbourne - in fact I'm pretty sure I couldn't do this as I need a light general anaesthetic (due to previous complications) and this is not a category 1 or 2 surgical procedure so not allowed. (1973-78 cohort participant)

I would like to have another discussion with a practitioner at Royal Women's Hospital about changing my birth control because I am having issues with it again. I have delayed this discussion and am making-do with the side-effects, when I probably would have made active plans had the COVID-19 pandemic not affected Victoria like this. (1989-95 cohort participant)

While my access to obtaining the Mirena hasn't changed, I haven't been in for a followup partially as a result of a reluctance to go to a doctor surgery for a non-vital service. (1989-95 cohort participant)

Although the majority of comments about contraception described barriers to use, it must be noted that a minority of women reported no difficulty in accessing contraception during the pandemic (as reported in Section 10.4.4). A small number of women wrote that they had not experienced or perceived any difficulties accessing their regular contraception and contraceptive care during the COVID-19 crisis:

No issues with contraceptives access. (1989-95 cohort participant)

Had to change my mirena over - quite straight forward to do during COVID. (1973-78 cohort participant)

Women also described using online services to both obtain their prescriptions and order their medications during the COVID-19 crisis. These services were spoken about positively, with women highlighting the convenience of not having to visit a GP and chemist and the increased ease of access:

I have changed the way I get my pill. I have swapped to an online Dr to have the pill sent to me in the mail so I can avoid the GP and chemist. I also don't have to worry about the availability of my pill. (1989-95 cohort participant)

I started using a pill delivery service. It meant that I didn't need to go to my gp to get a script. I had been thinking about this pre Covid but Covid did impact my decision to use the service. (1989-95 cohort participant)

Sexual activity

Women described a range of ways in which the COVID-19 had impacted their sexual activity. The impact of the COVID-19 crisis on single women's sexual activity was apparent. Many women, particularly from the 1989-95 cohort, explained that they had not been sexually active during the COVID-19 crisis. Some explained that this was due to social distancing recommendations:

In the context of these questions, I am not sexually active (no partner and currently social distancing). (1989-95 cohort participant)

I'm single and not currently sexually active and that's unlikely to change while socially distancing is still recommended. (1989-95 cohort participant)

Moreover, those living in areas with strict lockdown policies described having no opportunity for sexual relationships:

Single. Stage 4 lockdown. No sexual prospects possible. (1989-95 cohort participant)

A number of women from the 1973-78 cohort described changes to their sexual activity within their relationships during the COVID-19 crisis. Some reported having a reduced interest in sex due to stressors associated with the pandemic:

I feel like my libido is in quarantine! (1973-78 cohort participant)

I have not been intimate with my husband during covid, I think we are just too stressed and too tired. And he goes to bed early and gets up early (4:30am) and I go to bed late and get up late (7am), this is just so we can get through looking after 5 kids and running our business which has been able to continue to trade, but the cost of exhaustion is mounting with all the additional paperwork and homeschooling. (1973-78 cohort participant)

Some women offered insight into those working on the frontline of the pandemic, or with family participants in health care. Concerns about spreading the COVID-19 virus seemed to affect sexual behaviours within these relationships:

No energy for intimacy with partner and concerned about possible risks as well since he also works in front line as a GP. (1973-78 cohort participant)

Covid has likely contributed to having sex less due to me working in a hospital and being worried about possible spread of covid to my husband. (1973-78 cohort participant)

Fertility issues

Women reflected on the additional challenges faced by those experiencing fertility issues during the COVID-19 crisis. These included restricted access to fertility services and the associated mental health costs. Further, this subtheme relates to attitudes towards pregnancy, which is discussed later in this chapter:

My partner wants to begin the process of IUI and then IVF if unsuccessful but she wants to carry the baby. However due to IVF being an elective surgery that has been cancelled, it has been postponed. (1989-95 cohort participant)

I was accessing fertility treatment prior to covid restrictions and this did mean a period of not having access. However, living in SA I was able to recommence treatment recently which luckily resulted in pregnancy. (1989-95 cohort participant)

Extended stress and experienced depression due to ivf treatment being postponed. (1973-78 cohort participant)

Attitudes and beliefs

Attitudes towards having children

Women from the 1989-95 and 1973-78 cohorts wrote about their attitudes toward pregnancy and having children, and the ways in which the COVID-19 crisis impacted their beliefs and decisions.

A few women born 1989-95 and 1973-78 spoke about their increased desire to have children during the COVID-19 pandemic. Fertility issues, changes to employment, and the strengthening of relationships were some of the factors which contributed to this increased desire to have children:

This year has been intense in so many ways and I think just seeing how our relationship has held strong, and we've survived what has happened personally, and throughout the world, that has helped confirm the decision to have kids. (1989-95 cohort participant)

Bringing pregnancy plans forward due to feeling less tied to work. (1989-95 cohort participant)

I'm actually doing IVF as a single person because I've had a frozen embryo in storage for several years. There seemed like no better time than to give this one last go. (1973-78 cohort participant)

In general, women with fertility issues did not appear to change their pregnancy plans during the COVID-19 crisis. These women described continuing to try to start a family, despite the pandemic:

Due to my own ongoing chronic health issues impacting on our ability to conceive we decided not to take a break during Covid. I have fewer viable cycles than a healthy woman and we don't want to miss those opportunities as it would cause much longer delays for us than for others trying to conceive. (1989-95 cohort participant)

Some of these women acknowledged the complex circumstances under which they were trying to start a family due to the COVID-19 pandemic:

We had been trying to conceive for a year prior to the start of COVID-19. We had been struggling to conceive, and decided not to stop trying despite the pandemic. We finally managed to fall pregnant in June, and it feels like the timing isn't great given the increasing restrictions and second [wave] in Victoria where we live, but we didn't want to take any longer to get pregnant than absolutely necessary, since it had been so hard. (1989-95 cohort participant)

Many women from the 1989-95 cohort wrote about feeling highly reluctant about becoming pregnant or having children. Some women attributed this to the unforeseen circumstances resulting from the pandemic, including economic instability, limited maternal health services, and additional stress and uncertainty as reasons for the change in their stance on pregnancy and having children:

On the topic of pregnancy, if I was to fall pregnant (unplanned), I feel like I would be more inclined to get a TOP due to COVID than prior to COVID. This is due to the change in the public maternity system and lack of support for women in the perinatal period because of COVID. (1989-95 cohort participant)

I got pregnant about 5 weeks prior to Covid getting serious in WA. Had Covid had happened earlier, we probably would have stopped trying to get pregnant. It is a very stressful time to bring a baby into the world not knowing what is going to happen and the financial uncertainty that comes with that. (1989-95 cohort participant)

For other women, the COVID-19 pandemic validated their pre-existing desire to not have children. Overpopulation concerns, public health issues, and climate change were some of the concerns women had prior to the COVID-19 crisis:

If anything, I want a child even less than I did at the start of the pandemic. I already felt that I should not bring a child into the world due to climate change. I think having a child right now is doubly selfish and irresponsible. (1989-95 cohort participant)

Unpredictability was widely discussed as a major impact of the COVID-19 pandemic. Some women from the 1989-95 cohort wrote about their increased uncertainty surrounding the desire to have, or not have, children. A few women discussed the uncertainty around their ability to meet a partner during the pandemic whilst adhering to social distancing and lockdown requirements. Other women spoke of the uncertainty surrounding the virus more broadly, and whether it is appropriate to have children:

Regarding fertility plans COVID adds to my already long list of cons about having a baby. I remain undecided if i would like to have children one day or not. (1989-95 cohort participant)

My plans have not changed around pregnancy (I am still unsure about ever having children) and in fact this crisis has given me further reason not to become a mother. It seems very counterintuitive to bring another person I love into a world like this one. (1989-95 cohort participant)

The pandemic gives me another reason to worry about whether or not it is right to ever have children. (1989-95 cohort participant)

There was a consensus that pregnancy and having children during the pandemic was increasingly difficult and complex. Some women from the 1973-78 cohort discussed their relief and gratitude for having children prior to the COVID-19 pandemic:

Often reflect on how fortunate we are to have had our children prior to covid as I would have been terribly stressed about all the restrictions and ramifications if I was pregnant in this current time. (1973-78 cohort participant)

Who would like to bring a kid into this shitstorm. (1973-78 cohort participant)

Pregnancy and birth

One of the most prominent themes drawn from the comments concerned the difficulties associated with being pregnant and giving birth during the COVID-19 crisis. This included the multifaceted struggle of many women from the 1989-95 cohort experiencing pregnancy and the postpartum period while living through a pandemic. One woman from the 1989-95 cohort highlighted this concurrent adversity:

I gave birth in March 2020 to my first baby. So I've been navigating COVID alongside navigating post-partum, often it's hard to tell which major event has affected me more. (1989-95 cohort participant)

Women also wrote about the impact of the COVID-19 pandemic restrictions on mothers and pregnant women, including the isolation associated with travel and gathering restrictions, the limitations of health care during pregnancy and the postpartum period, added financial and economic stressors, and the impact on women's mental health.

A number of women identified the challenges associated with travel and gathering restrictions for women who had given birth during the COVID-19 crisis. Women from the 1989-95 cohort described being isolated at home, many unable to have family members visit during this time. This was associated with feelings of stress and depression:

my baby was born at the start of the pandemic. It really impacted my mental health as I was isolated and only had my partner and baby. (1989-95 cohort participant)

...none of our family will get to meet our newborn until well who knows..... it is depressing thinking about it. (1989-95 cohort participant)

Additionally, with family members unable to visit, many mothers explained that accessing emotional and practical support was difficult during this time:

There was a time when I was pregnant since covid began and covid made keeping the baby impossible as my family are in NSW and I'm Victoria and I couldn't see there being any support to do it on my own. (1989-95 cohort participant)

I had a baby in the height of COVID 19. It was hard to access family support in the early days. Things are now relatively normal in WA for which I am grateful. (1989-95 cohort participant)

An overwhelming number of comments were made about shortfalls of perinatal health care during the COVID-19 crisis. Several women reported having perinatal appointments cancelled, leaving them feeling unsupported and unprepared for pregnancy and motherhood:

Covid has affected my antenatal appointments and potential for meeting other pregnant mothers via antenatal classes. (1989-95 cohort participant)

covid caused me to have less prenatal visits throughout my pregnancy. My birth class was also cancelled so I felt I didn't receive the knowledge people normally would for birth. (1989-95 cohort participant)

Pregnant women described a number of changes to regular care during the COVID-19 crisis. Some women wrote about appointments being replaced by telehealth sessions, or having face-to-face appointments which were quite short in duration. A large number of women commented on the restrictions to the number of people allowed in consultation rooms during the pandemic. These women explained that their partners were unable to attend many appointments, leaving them without a source of support. The stress associated with this was particularly evident:

Husband has not been able to attend most obstetrician appointments (based at private hospital), which has been pretty upsetting as we are first-time parents. (1989-95 cohort participant)

Partner hasn't been allowed to attend appointments. I was admitted to hospital this week due to reduced movement of baby and my partner was not allowed to enter the hospital with me. This was extremely stressful and difficult for us both. (1989-95 cohort participant)

I have PTSD from my first pregnancy/birth, and have found the differences in antenatal care this time around quite challenging and anxiety inducing. Not all appointments are face to face, the appointments I do have seem quite brief to try and limit the time spent with each patient. (1989-95 cohort participant)

The economic impact of the COVID-19 pandemic was also described in relation to pregnancy and newborn babies. Women described struggling financially during this time, including facing the impact of the COVID-19 pandemic on their employment and maternity leave plans:

It's becoming more and more stressful with a baby at home and not being able to see family. I am also really struggling financially we have no income right now. (1989-95 cohort participant)

COVID-19 has impacted on the amount of time I will be able to spend with my baby as my husband has lost his job but I still have mine. I will not be able to spend the planned year with my baby and will likely stop breastfeeding earlier than 12 months as well. (1989-95 cohort participant)

The profound impact of the concurrent stressors on mothers and pregnant women during the COVID-19 crisis was clear. Women from the 1989-95 cohort described major deficits in their mental health during this time, including experiencing stress, depression, and anxiety.

These ridiculously strict restrictions imposed on us for extended periods of time in Vic is ruining my mental health dramatically. I am not able to enjoy this pregnancy or any aspect of life as I normally would. (1989-95 cohort participant)

I have developed diagnosed post natal depression during covid and believe without the stage 4 restrictions in Melbourne I may not have. (1989-95 cohort participant)

10.6 Conclusion

Most women indicated that they could access their usual contraception during the pandemic. Nevertheless, the qualitative data suggest that difficulty with accessing contraception was distressing for the 6% of women aged 25-31 and 2% of those aged 42-47 who reported this experience. Some women (14% of women aged 25-31 and 3% of women aged 42-47) reported changing their contraception during the pandemic, with qualitative data indicating a number of reasons beyond access issues, including the desire to have children sooner and becoming less sexually active.

The impact of the pandemic on family planning decisions was noted by a minority of women. One in ten women aged 25-31 indicated that they had reconsidered when, or if, to have children, demonstrating the disruption of the pandemic to life plans. The qualitative data revealed the depth of feeling evoked by the pandemic with regard to having children, with the COVID-19 crisis seen as a catalyst for delaying pregnancy, deciding to never have children, confirming the desire to have children, or deciding to have children earlier than originally planned.

10.7 References

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11. APPENDICES

11.1 Appendix for Chapter 1: Participant retention

Participants from the 1973-78 and 1946-51 cohorts have been surveyed approximately every three years since 1996, while participants in the 1989-95 cohort have been surveyed annually from 2013 to 2017 and then again in 2019 (Table 11-1).

Table 11-1 Schedule of surveys across the three ALSWH cohorts born 1989-95, 1973-78 and 1946-51, detailing year, age range and number of respondents at each survey.

Survey	1989-95 Cohort	1973-78 Cohort	1946-51 Cohort
1	2013 Aged 18-23 N = 17,010	1996 Aged 18-23 N = 14,247	1996 Aged 45-50 N = 13,714
2	2014 Aged 19-24 N = 11,345	2000 Aged 22-27 N = 9,688	1998 Aged 47-52 N = 12,338
3	2015 Aged 20-25 N = 8,961	2003 Aged 25-30 N = 9,081	2001 Aged 50-55 N = 11,226
4	2016 Aged 21-26 N = 7,287	2006 Aged 28-33 N = 9,145	2004 Aged 53-58 N = 10,905
5	2017 Aged 22-27 N = 8,495	2009 Aged 31-36 N = 8,200	2007 Aged 56-61 N = 10,638
6	2019 Aged 24-30 N = 8,346	2012 Aged 34-39 N = 8,009	2010 Aged 59-64 N = 10,011
7		2015	2013

Survey	1989-95 Cohort	1973-78 Cohort	1946-51 Cohort
		Aged 37-42 N = 7,186	Aged 62-67 N = 9,151
8		2018 Aged 40-45 N = 7,121	2016 Aged 65-70 N = 8,622
9			2019 Aged 68-73 N = 7956

11.2 Appendix for Chapter 2

11.2.1 Measurement of contraception in ALSWH surveys

Questions about contraception in 1989-95 cohort surveys

Women in the 1989-95 cohort were asked about their use of contraception in Surveys 1, 2, 3, 5 and 6. The questions are largely consistent across Surveys 1, 2, 3, and 5. At Surveys 3 and 6, comparable questions to those asked of the 1973-78 cohort were asked. Women were also asked whether they were currently pregnant at the time of each survey. Table 11-2 summarises the response options for the questions relating to contraception and their comparability across surveys.

In Survey 1, women were asked if they had ever had vaginal sex. If they answered yes, they were then asked about what types of contraception they used 'the last time they had vaginal sex', with the ability to choose multiple responses. The same question was asked in Surveys 2, 3, 5 and 6, with the exception that vaginal sex was defined as 'penis in vagina sex'. The data used in Chapters 2, 3 and 4 of this report are derived from this question.

In Surveys 3 and 6, an additional question was asked to enable comparisons with questions asked of the 1973-78 cohort. This question asked about a more extensive list of contraception options (see Table 11-4), and women could select multiple

responses. At Survey 6, a separate question asked women about their reasons for not using contraception.

Questions about contraception in 1973-78 cohort surveys

Women in the 1973-78 cohort were asked about their use of contraception in each of the eight surveys. The questions vary between surveys, with the response options for methods of contraception and reasons for non-use becoming more extensive over time. Table 11-3 summarises the response options for the questions relating to contraception and their comparability across surveys. These questions were similar between Surveys 1 and 2, and between Surveys 3 and 4. An extended number of questions were asked at each of Surveys 5 to 8 (see exact questions in Table 11-5). Women were also asked whether they were currently pregnant at the time of each survey.

In Survey 1, women were asked two questions about contraception use. In the first, women could only select one response from 'don't need to use any (e.g. pregnant or no sex)'; 'choose not to use any (e.g. want to be pregnant)'; 'OCP'; 'condoms'; and 'other'. A separate question asked women about use of the OCP for 'reasons other than contraception', and condoms for 'STD/HIV prevention'. Women could answer 'yes' to both of these options. In contrast to Survey 1, Survey 2 included only one question with all the options listed in Table 11-3 (except whether they were currently pregnant), with women directed to select as many responses as applied to them.

In Survey 3, women were asked to indicate which form(s) of contraception they were currently using. Women who indicated that they did not use contraception were asked to indicate the best reason for non-use from a list of options. As in the first two surveys, Survey 3 also included a question about other reasons for using the contraceptive pill and use of barrier methods for the prevention of infection. The question wording differs slightly, but the responses are comparable with those in Surveys 1 and 2.

In Survey 4, women were also asked about forms of contraception they were currently using, and all women (not just non-users as in Survey 3) were asked about a range of situations that may explain their non-use. All women, regardless of whether they used contraception, were asked to answer this question, and unlike the question in Survey 3, they were able to select multiple responses.

In Surveys 5 to 8, all women were asked about a more extensive list of contraception options and were able to select multiple responses.

Table 11-2 Response options for methods of contraception for women in 1989-95 cohort in each of Surveys 1, 2, 3, 5 and 6

Survey 1	Survey 2	Survey 3	Survey 5	Survey 6
Response options for ‘Thinking about the last time you had penis in vagina sex, did you use any of the following?’				
The Pill	The Pill	The Pill	The Pill	The Pill
Condoms	Condoms	Condoms	Condoms	Condoms
Implanon	Implanon	Implanon	Implanon	Implanon
Mirena	Mirena	Mirena	Mirena	Mirena
Other contraceptive	Other contraceptive	Other contraceptive	Other contraceptive	Other contraceptive
None	None	None	None	None
Response options for “What type of contraception do you use now?”				
		I use a combined oral contraceptive pill (The Pill)		I use a combined oral contraceptive pill (The Pill)
		I use a progestogen only oral contraceptive pill (The Mini Pill)		I use a progestogen only oral contraceptive pill (The Mini Pill)
		I use the oral contraceptive pill but I don’t know what type		I use the oral contraceptive pill but I don’t know what type
		I use condoms		I use condoms
		I use emergency contraception (eg morning after pill)		I use emergency contraception (eg morning after pill)
		I use an implant (eg Implanon)		I use an implant (eg Implanon)
		I use the withdrawal method		I use the withdrawal method
		I use a copper - (IUD)		I use a copper intrauterine device (IUD)
		I use a progestogen intrauterine device (IUD) (eg Mirena)		I use a progestogen intrauterine device (IUD) (eg Mirena)

Survey 1	Survey 2	Survey 3	Survey 5	Survey 6
		I use an injection (e.g., Depo-provera)		I use an injection (eg Depo-provera)
		I use a safe period method (e.g., natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence)#		I use a safe period method (eg natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence)#
		I use a vaginal ring (e.g., Nuvaring)		I use a vaginal ring (eg Nuvaring)
		I use another method of contraception		I use another method of contraception
		I don't use contraception		I don't use contraception

OCP – oral contraceptive pill; IUD - intrauterine device; # - natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence.

Table 11-3 Response options for methods of contraception for women in 1973-78 cohort in each of Surveys 1 to 8

Survey 1	Survey 2	Survey 3	Survey 4	Surveys 5 to 8
OCP	I use the OCP for contraception	I use the OCP	I use the OCP	I use a combined OCP I use a progestogen OCP I use a OCP but do not know what type
Using the OCP for reasons other than contraception	I use the OCP for other reasons	Using the OCP for reasons other than contraception		
Condoms	I use condoms for contraception	I use condoms	I use condoms	I use condoms
Using condoms for STD/HIV prevention	I use condoms (or other barrier methods) for prevention of infection	Using condoms (or other barrier methods) for prevention of infection		

Survey 1	Survey 2	Survey 3	Survey 4	Surveys 5 to 8
		I use an implant*	I use an implant	I use an implant
		I use emergency contraception	I use emergency contraception	I use emergency contraception
				I use a copper IUD
				I use a progestogen IUD
				I use an injection
			I use the withdrawal method	I use the withdrawal method
				I use a safe period method#
				I use a vaginal ring
Other	Other	I use another method of contraception	I use another method of contraception	I use another method of contraception
Don't need to use any Choose not to use any	Don't need to use any Choose not to use any	I don't use contraception	I don't use contraception	I don't use contraception

*OCP – oral contraceptive pill; IUD - intrauterine device; * Implants were made available in Australia in 2001; # - natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence.*

Table 11-4 Questions and response options asked at all surveys for 1989-95 cohort

Surveys 1, 2, 3, 5, 6: Thinking about the last time you had penis in vagina sex, did you use any of the following? (Mark all that apply)	
a	The Pill
b	Condoms
c	Implanon
d	Mirena
e	Other of contraception
f	None
Survey 3: Do you use any of the following now? (Mark all that apply)	
Survey 6: What forms of contraception do you use now? (Mark all that apply)	
a	I use a combined oral contraceptive pill (the Pill)
b	I use a progestogen only oral contraceptive pill (the Mini Pill)
c	I use the oral contraceptive pill but I don't know what type
d	I use condoms
e	I use emergency contraception (e.g., the morning after pill)
f	I use an implant (e.g., Implanon)
g	I use the withdrawal method
h	I use a copper intrauterine device (IUD)
i	I use a progestogen intrauterine device (IUD) (e.g., Mirena)
j	I use an injection (e.g., Depo-provera)

k	I use a safe period method (e.g., natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence)
l	I use a vaginal ring (e.g., Nuvaring)
m	I use another of contraception
n	I don't use contraception

Table 11-5 Questions and response options asked at all surveys for 1973-78 cohort

Survey 1: What sort of contraception do you use now?		Response		
1	Don't need to use any (e.g., pregnant or no sex)	Y	N	DK
2	Choose not to use any (e.g., want to be pregnant)	Y	N	DK
3	Oral contraceptive pill	Y	N	DK
4	Condom	Y	N	DK
5	Other (Please specify on line)	Y	N	DK
Survey 2: Which of the following apply to you now? (Mark all that apply)		Response		
a	I don't need to use any (e.g., pregnant or no sex)	Y	N	
b	I choose not to use any (e.g., want to be pregnant)	Y	N	
c	I use the oral contraceptive pill for contraception	Y	N	
d	I use the oral contraceptive pill for other reasons	Y	N	
e	I use condoms for contraception	Y	N	
f	I use condoms (or other barrier method) for prevention of infection	Y	N	
g	I use another of contraception	Y	N	

Survey 3: What forms of contraception do you use now? (Circle all that apply)

a	I use the oral contraceptive pill
b	I use condoms
c	I use emergency contraception (the morning after pill)
d	I use an implant (e.g., Implanon)
e	I use another of contraception
f	None, I don't use contraception

Survey 4: What forms of contraception do you use now? (Circle all that apply)

a	I use the oral contraceptive pill
b	I use condoms
c	I use emergency contraception (the morning after pill)
d	I use an implant (e.g., Implanon)
e	I use the withdrawal method
f	I use another of contraception
g	I don't use contraception

Surveys 5 to 8: What forms of contraception do you use now? (Mark all that apply)

a	I use a combined oral contraceptive pill (the Pill)
b	I use a progestogen only oral contraceptive pill (the Mini Pill)
c	I use the oral contraceptive pill but I don't know what type
d	I use condoms
e	I use emergency contraception (e.g., the morning after pill)

f	I use an implant (e.g., Implanon)
g	I use the withdrawal method
h	I use a copper intrauterine device (IUD)
i	I use a progestogen intrauterine device (IUD) (e.g., Mirena)
j	I use an injection (e.g., Depo-provera)
k	I use a safe period method (e.g., natural family planning, rhythm method, Billings method, body temperature method, periodic abstinence)
l	I use a vaginal ring (e.g., Nuvaring)
m	I use another of contraception
n	I don't use contraception

Table 11-6 Data used in Figure 2-1: Prevalence of contraception methods used by women in the 1989-95 cohort in Surveys 1, 2, 3, 5 and 6

Contraceptive method N (%)	S1	S2	S3	S5	S6	Total
OCP	2,631 (60.2)	2,601 (57.4)	2,572 (54.9)	2,075 (45.5)	1,675 (34.2)	1,1554
Condoms	1,958 (44.8)	1,909 (42.1)	1,838 (39.2)	1,759 (36.0)	1,525 (31.1)	8,989
Implanon	445 (10.2)	492 (10.9)	543 (11.6)	546 (11.2)	466 (9.5)	2,492
Mirena	98 (2.2)	144 (3.2)	206 (4.4)	428 (8.8)	651 (13.3)	1,527
Other	150 (3.4)	148 (3.3)	176 (3.8)	221 (4.5)	269 (5.5)	964
None	386 (8.8)	447 (9.9)	483 (10.3)	773 (15.8)	1,023 (20.9)	3,112

Table 11-7 Data used in Figure 2-2: Transition plot of use of contraception by women in the 1989-95 cohort between Surveys 1, 2, 3, 5 and 6

Contraceptive method (%)	S1	S2	S3	S5	S6
Pill	60.8%	57.6%	54.4%	41.8%	33.6%
Condom	19.4%	19.5%	19.2%	21.8%	21.2%
Long acting (Implanon, Mirena)	9.6%	11.0%	13.0%	16.6%	19.2%
Other	1.9%	2.1%	2.9%	3.5%	4.5%
None	8.3%	9.8%	10.5%	16.3%	21.6%

To create the transition plot, one contraception choice per woman per survey was needed. In the surveys, however, women could mark all that apply, so if a woman chose more than one type of contraception, only one was chosen at each time point.

The preference order used in this plot was none, pill, condom, long acting method (Implanon, Mirena), and other.

Table 11-8 Data used in Figure 2-3: Prevalence of contraception methods used by women in the 1973-78 cohort from Survey 1 to Survey 8

Contraceptive method N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
OCP	1,786 (47.6)	2,044 (55.9)	1,888 (53.4)	1,403 (44.6)	1,063 (35.6)	871 (31.4)	648 (25.2)	482 (20.1)	10,185
Condoms									6,884
	729 (19.4)	1,004 (27.5)	1,147 (32.4)	1,033 (32.8)	936 (31.3)	816 (29.4)	654 (25.4)	565 (23.6)	
LARC					421 (10.8)	561 (15.5)	672 (19.9)	773 (24.5)	2,427
Withdrawal				391 (10.2)	424 (11.7)	361 (10.7)	364 (11.6)	330 (11.2)	1,870
Fertility awareness period					194 (4.9)	174 (4.8)	159 (4.7)	137 (4.3)	664
None	1,118 (29.8)	643 (17.6)	807 (22.8)	635 (20.2)	667 (22.3)	646 (23.3)	631 (24.5)	626 (26.1)	5,773
Emergency			45 (1.2)	49 (1.4)	27 (0.8)	24 (0.8)	16 (0.6)	14 (0.5)	175

11.3 Appendix for Chapter 3: Socioeconomic and health behaviour variations in the use of contraceptives

11.3.1 Detailed descriptions of associations between contraceptive use and socioeconomic factors and health risk behaviours by women in the 1989-95 cohort

OCP use and socioeconomic factors

At Survey 1, OCP use was highest among women living in outer regional, major cities and inner regional areas (around 60%), compared to those living in remote (50%) areas. By Survey 6, 36% of women in major cities used the OCP, followed by 31% of women in inner regional and remote areas and 25% of women living in outer regional areas.

At Survey 1, OCP use was highest in women with a university education and year 12 education (about 64%), followed by a trade/certificate/diploma (51%) and less than year 12 education (43%). By Survey 6 when the women were aged 24 to 30, use had decreased (university level (37% used the OCP), year 12 education and trade/certificate/diploma (both 28%) and less than year 12 education (25%)).

Regarding marital status, OCP use at Survey 1 was highest in women who had never married or were in a de facto relationship (60%), compared with women who were married (48%). By Survey 6, these of the OCP had dropped for women in all marital status groupings, with use highest in women who never married or were in a de facto relationship (at 38%) and lowest in married women (22%).¹⁴

Use of OCP at Survey 1 was highest in women who found it easiest to manage on their income ('it is not too bad' 64%, 'it is easy' and 'it is difficult some of the time', both 59%) with slightly lower percentages for women who found it difficult all the time (57%) or impossible (56%). By Survey 6, OCP use had dropped to between 32% and 36%

¹⁴ *There were too few women who were separated, widowed or divorced to make meaningful interpretations*

of women who found it 'easy', 'not too bad' or 'difficult' to manage on their income. Use remained lowest, at 21%, for women who found it 'impossible'.

OCP use and health risk behaviours

At Survey 1, OCP use was highest in women who were low risk drinkers (63%) followed by those who drank alcohol rarely (57%), were risky drinkers or non-drinkers (about 51%). By Survey 6, 37% of women who were low risk drinkers and 32% of women who rarely drank reported using the OCP, while only 20% of non-drinkers did so. There was no change in OCP use for women who were risky drinkers.¹⁵

OCP use at Survey 1 was higher in women who were non-smokers (64%) and ex-smokers (57%) compared with current smokers (46%). By Survey 6, use of OCP had halved to 36% in women who were non-smokers and 25% for ex-smokers. In smokers OCP use at Survey 6 was 30%.

Regarding participation in physical activity, at Survey 1 use of the OCP was highest in women who participated in high, moderate and low levels of physical activity (around 60% in each) and lowest in those who were inactive (51%). While use of the OCP was lower at Survey 6, it remained highest for women who participated in high and moderate levels of physical activity (about 36%), followed by women with low physical activity levels or who were inactive (about 30%).

OCP use at Survey 1 was higher in women who were in the BMI underweight or healthy weight range (64%), about 55% in women who were in the overweight range, and the lowest (44%) in women with a BMI in the obese range. At Survey 6, about 38% of women who were in the underweight or a healthy weight groups used the OCP, compared with around 30% of women who were in the overweight or obese groups.

Use of OCP at Survey 1 was highest in women who had never used marijuana (64%) compared with about 57% for women who had been using marijuana for more than 12 months and were still current users, and those who had only used the drug in the last

¹⁵ *There were too few women who were high risk drinkers to make meaningful interpretations about their use of the OCP.*

12 months. At Survey 3 (the last time the same question was asked, when the women were 20 to 25 years of age) the percent of women using OCP by whether they use marijuana had not changed by more than a few percent, with the exception that use by women who had been using marijuana for more than 12 months and were still current users was at 49%. At Survey 6, a different question asked the women how often they used marijuana. Use of the OCP was higher (about 35%) in women who either did not use marijuana or used it infrequently (every few months, 1-2 times a year), compared to lower use of the OCP (23%) by women who used marijuana more frequently (every day, at least once a week, about one a month).

Illicit drug use (amphetamines, LSD, natural hallucinogens, tranquilisers, cocaine, ecstasy, inhalants, heroin or barbiturates) was asked at Surveys 1, 2 and 3. Similar patterns at Survey 1 and Survey 3 by frequency of use to those seen for marijuana were observed.

Condom use and socioeconomic factors

At Survey 1, condom use was similar in women living in major cities, inner regional, outer regional and remote areas (between 42%-46%). By Survey 6, the percent of women using condoms in major cities, inner regional, and outer regional areas had decreased to around 30% regardless of where the women lived.

At Survey 1, condom use was highest in women with a year 12 education (48%), followed by a university level (44%), trade/certificate/diploma (40%) and less than year 12 education (38%). By Survey 6, when the women were aged 24 to 30, use of condoms was highest in university educated women and those with less than year 12 (about 32%), and was lower in women with a year 12 education or a trade/certificate/diploma level (about 26%).

Use of condoms at Survey 1 was highest in women who were never married (49%), followed by those in a de facto relationship or who were married (around 30%). At Survey 6, condom use was lower in all groups regardless of their marital status (40% for never married women, 26% for those in a de facto relationship, 22% for married women).

Condom use by women at Survey 1 was around 45% in women who found it 'easy' or 'not too bad' or 'difficult some or all of the time' to manage on their income. Use was lowest, at 42%, for women who found it 'impossible'. By Survey 6, condom use was at between 30% and 33% for women regardless of how easy they found it to manage on their income.

Use of condoms at Survey 1 was between 45-50% in women who were born in Australia, another English speaking country, or in another country. At Survey 6, use was lower, at around 30%, for women born in Australia or another English speaking country, and 41% in women born in another country.

Women who spoke an Asian or other language at home had the highest rates of using condoms at Survey 1 (about 60%), with use by women who spoke English about 45%. At Survey 6, OCP use by women who spoke an Asian language still had the highest use of condoms (about 50%) compared with women who spoke English or another language (about 30%).¹⁶

Condom use and health risk behaviours

At Survey 1, condom use by women was between 44% and 48% regardless of how much they consumed alcohol (never, rarely, or at low risk or risky levels). By Survey 6, use of condoms by the women was around 30%, with no clear differences by how much they drank.¹⁷

Condom use at Survey 1 was higher in women who were non-smokers (47%) compared with ex-smokers (43%) or smokers (39%). By Survey 6, use of condoms had decreased to 32% in non-smokers and was about 27% for both ex-smokers and smokers.

Use of condoms at Survey 1 was similar in women regardless of how much physical activity they participated in (between 43% to 46%). By Survey 6, use of condoms was

¹⁶ *There were too few women who spoke a European language to make meaningful interpretations.*

¹⁷ *There were too few women who drank at a level considered high risk to make meaningful conclusions.*

around 30% (ranged between 28 to 33%) for women in all categories of physical activity.

Condom use at Survey 1 was similar in women regardless of their BMI (between 44% to 48%). By Survey 6, use of condoms was around 30% (ranged between 28% to 32%) for women in all categories of BMI.

Use of condoms at Survey 1 was highest in women who had never used marijuana (50%) compared with about 38% for women who had been using marijuana for more than 12 months and were still current users, and those who had only used the drug in the last 12 months. By Survey 3, use of condoms was around 40% for women in all categories of marijuana use. At Survey 6, the question that asked the women how often they used marijuana revealed that condom use was higher (about 31%) in women who either did not use marijuana or used it infrequently (about one a month, every few months, 1-2 times a year), compared to lower use of condoms (23%) by women who used marijuana daily or weekly.

Regarding use of illicit drugs (amphetamines, LSD, natural hallucinogens, tranquilisers, cocaine, ecstasy, inhalants, heroin or barbiturates), use of condoms at Survey 1 was higher in women who never used these drugs (49%) compared with around 35% for women who used them (regardless of frequency of use). By Survey 3, use for women who never used illicit drugs had dropped to 43% compared with reductions to 30% for women who used them.

Implanon use and socioeconomic factors

At Survey 1, Implanon use was slightly higher in women living in inner regional, outer regional and remote areas (around 13%) compared with women in major cities (9%). By Survey 6, the percent of women using Implanon was around 10% for women regardless of where they lived.

At Survey 1, Implanon use was highest in women with a trade/certificate/diploma education (13%), followed by a year 12 education, less than year 12 education, and university level (around 9%). By Survey 6 use ranged between 8-10% for all women, regardless of their level of education.

Use of Implanon at Survey 1 was about twice as high in women who were in a de facto relationship (12%) or had never married (10%) compared with married women (6%). At Survey 6, there was very little change in percent for women in any of these marital status groups.

Implanon use by women at Survey 1 was highest in women who found it impossible to manage on their income (13%), and between 9-11% for women in the other income categories (it is easy, it is not too bad, it is difficult some of the time, it is difficult all of the time). At Survey 6 there was essentially no change in percent of women using Implanon in each income management category.

Use of Implanon at Survey 1 was 10% in women who were born in Australia and 6% in women born in another English speaking country. At Survey 6, use had not changed for women born in Australia or another English speaking country.¹⁸ Around 10% of women who spoke English at home used Implanon at Survey 1 and 6.¹⁹

Implanon use and health risk behaviours

At Survey 1, Implanon use by women was between 10 to 12% in women who rarely drank alcohol or drank at a low risk level, and was 8% for women who either did not drink or drank at risky levels. At Survey 6, use had not changed for women who drank rarely, drank at a low risk level, or drank at risky levels, but had slightly dropped to 5% for women who were non-drinkers.

Implanon use at Survey 1 was 13%, 11% and 9% in women who were smokers, ex-smokers and never smokers, respectively. By Survey 6, only small changes in percent were observed, with the biggest change found for smokers, where use dropped to 8%.

¹⁸ *There were insufficient numbers of women who were born in a non-English speaking country and who used Implanon to make conclusions.*

¹⁹ *There were too few women who used Implanon who spoke either an Asian Language or another language to make meaningful conclusions.*

Use of Implanon at Survey 1 was 13% in women who were inactive, and ranged from 9-11% in women who had low, moderate or high levels of physical activity. At Survey 6, use was between 8-10% regardless of how much physical activity the women participated in.

Implanon use at Survey 1 was highest in women with a BMI in the obese (16%) or overweight (13%) ranges, compared with women in the healthy weight (9%) or underweight (5%) ranges. By Survey 6, 11% of women in the obese or overweight ranges used Implanon, and around 7% of women in the healthy weight or underweight range also used the implant.

Implanon use by women at Survey 1 was highest in women who had been using marijuana for more than 12 months and were still current users (13%), and between 9% to 11% for women who had never used marijuana, who had only used the drug in the last 12 months or who had used the drug more than 12 months ago. By Survey 3, use of Implanon was 14% for women who had only used the drug in the last 12 months and 11% for women in the other marijuana use categories. At Survey 6, the different question which asked the women how often they used marijuana showed that use of Implanon was between 9 and 12% regardless of whether or how often they used marijuana.

Regarding use of illicit drugs (amphetamines, LSD, natural hallucinogens, tranquilisers, cocaine, ecstasy, inhalants, heroin or barbiturates), use of Implanon at Survey 1 was between 10 and 12% in women regardless of whether or how often they had used such drugs, with these percentages showing little change at Survey 3.

Mirena use and socioeconomic factors

At Survey 6, Mirena use was higher in women living more remotely (in outer regional and remote areas, around 18%) compared with those living in major cities or inner regional areas (around 12%).

At Survey 6, use of Mirena was highest in women with more education (between 11-14% for women with a university education, trade/certificate/diploma education or year 12 education) and lowest, at 7% in women with a less than year 12 education.

At Survey 6, use of Mirena was slightly higher (about 14%) in women who had either never married or were in a de facto relationship, and 10% for married women.

Mirena use at Survey 6 was highest in women who either found it impossible or easy to manage on their income (about 17%) and around 12% for women in the other income categories (it is not too bad, it is difficult some of the time, it is difficult all of the time).

At Survey 6, use of Mirena ranged from 13% to 16% for women regardless of where they were born and also in women who spoke English at home.²⁰

Mirena use and health risk behaviours

At Survey 6, Mirena use was highest in women who drank at risky (19%) or low risk levels (15%) compared with women who drank rarely (11%) or did not drink (6%).

Mirena use was around 13% at Survey 6 in women regardless of whether the women had ever smoked or were current smokers, by how much physical activity they participated in or their BMI.

Mirena use by women at Survey 3 was 5% regardless of whether or how much marijuana or illicit drugs were used. At Survey 6, the different question which asked the women how often they used marijuana showed that use of Mirena was higher (between 15-20%) for women who used marijuana compared with 12% in women who never used it.²¹

²⁰ *There were too few women who used Mirena who spoke either an Asian Language or another language to make meaningful conclusions.*

²¹ *Use of 'other contraception' is found included in Appendix 11.2*

Use of no contraception and socioeconomic factors

At Survey 1, use of no contraception was around 9% by women living in urban and regional areas and 12% in women living in remote areas. At Survey 6, this percent had increased to around 19% for women living in major cities and around 27% for women living in inner regional, outer regional or remote areas.

At Survey 1, use of no contraception was lowest in women with a university level or year 12 education (7%), and two to three times higher in women with a trade/certificate/diploma (14%) or less than year 12 education (20%). At Survey 6, use remained highest in women with a less than year 12 education (35%), followed by around 30% in women with a trade/certificate/diploma or year 12 education. Use of no contraception was lowest, at 17%, in university educated women.

Use of no contraception was almost three times higher in married women (26%) at Survey 1 compared with women who were in a defacto relationship or who had not married (9%). Use of no contraception at Survey 6 was higher for all women and continued to be about three times higher for married women (41%) than women in a defacto relationship or who had not married (about 14%).

Women who found it impossible to manage on their income used no contraception slightly more (13%) than women who found it easier or less difficult (8-11%). At Survey 6, use of no contraception remained highest in women who found it impossible (34%) compared with women who found it not too bad, difficult some of the time or difficult all of the time to manage on their income, at 21%). Women who found it easy to manage on their income at Survey 6 were the least likely to use no contraception (16%).

Use of no contraception was 9% at Survey 1 and around 23% at Survey 6 for women regardless of which country they were born in.

Use of no contraception was 9% at Survey 1 in women who spoke either English or another language at home. At Survey 6, use of no contraception was 34% in women who spoke another language and 21% in women who spoke English.²²

Use of no contraception and health risk behaviours

At Survey 1, use of no contraception was highest in women who did not drink (19%), compared with around 12% of women who drank rarely or at risky levels. Use of no contraception was lowest in women who drank at low risk levels (7%). At Survey 6, use was highest in women who did not drink (45%), followed by 25% in women who drank rarely and about 15% of women who drank at low risk or risky levels.²³

Use of no methods of contraception was around 8% at Survey 1 for women who did not smoke or were ex-smokers and 16% of smokers. At Survey 6, around 28% of women who smoked or were ex-smokers used no contraception, with fewer women who did not smoke using no contraception (19%).

Use of no contraception was less in women who were more active at Survey 1 (7% in moderate and high active women, 10% in low active women and 14% in inactive women). At Survey 6, the same trend was observed (16% of high active, 23% of moderately active, 26% of low active and 28% of inactive women did not use contraception).

Use of no contraceptives at Survey 1 was around 8% in women with a BMI in the underweight, healthy weight or overweight categories, and 13% in women in the obese category. At Survey 6 use of no contraception was around 20% in women in the healthy weight or overweight categories, and around 25% in women in the underweight or obese categories.

²² *There were too few women who spoke either an Asian or European language to make meaningful conclusions about their use of no contraception*

²³ *There were too few women who drank at a high risk level to make meaningful conclusions about their use of no contraception*

Use of no contraceptives was similar (around 10%) between Survey 1 and 3 regardless of whether or how often they used marijuana they used. At Survey 6, the different question which asked the women how often they used marijuana showed that use of no contraception was highest in women who used it every day (32%) compared to 25% for those using it either weekly or monthly, 22% for those who never used it, and 17% for those using it either every few months or once or twice a year.

For illicit drug use, use of no contraception at Survey 1 and 3 was lowest for women who never used these substances (7-9%), and slightly higher for women who used them (around 14%).

Use of other contraception and socioeconomic factors

Use of other contraceptive methods was around 5% to 6% at Survey 6 regardless of where the women lived, their marital status or their ability to manage on their income.

At Survey 6, use of other contraception was around 9% in women with a year 12 education compared with women with a trade/certificate/diploma or university level education (5%). Use of other contraception by women with a less than year 12 education could not be reliably determined due to low numbers.

Use of other contraception at Survey 6 was 6% in women born in Australia and 3% in women born in another English-speaking country. Note: There were insufficient numbers of women who were born in a non-English speaking country and who used other contraceptives to make conclusions.

Use of other contraceptives in women who spoke English at home was 6% at Survey 6. Note: There were too few women who used other contraceptives who spoke either an Asian language or another language to make meaningful conclusions.

Use of other contraception and health risk behaviours

Use of other contraceptives was 6% at Survey 6 in women regardless of whether or how much they drank alcohol, whether they had ever smoked or were current smokers, how much physical activity they did or their BMI.

Use of other contraceptives by women at both Survey 1 and 3 was between 3 to 5%, regardless of how much marijuana or illicit drugs they used. At Survey 6, the different question which asked the women how often they used marijuana showed that use of other contraceptives was around 5% for women who rarely or never used marijuana (reliable estimates of their use of other contraception could not be determined in women who used marijuana more frequently at Survey 6 due to insufficient numbers).

11.3.2 Detailed descriptions of associations between some contraceptive use and socioeconomic factors and health risk behaviours by women in the 1973-78 cohort

LARC use by socioeconomic factors

At Survey 5, use of LARCs was about 8% for women living in major cities and about 13% for women living in regional and remote areas. By Survey 8 use had almost tripled for women living in major cities and remote areas, and doubled for women living in inner and outer regional areas.

At Survey 5, use of LARCs was between 10% and 15% in women regardless of how much education they had attained. At Survey 8, use was around 24% in women with a year 12 level of education or higher, and 17% in women with less than a year 12 level of education.

Use of LARCs at Survey 5 was highest in women who were separated (17%) and around 10% in women who were married, in a defacto relationship, divorced or had never married. At Survey 8, LARCs were used more by women who were separated or married (30%) compared with women in the other marital status categories (about 18%).²⁴

²⁴ *There were too few women who were widowed to make meaningful interpretations.*²⁵ *There were too few women who reported that it was impossible to manage on their income to make meaningful interpretations.*

Use of LARCs was around 12% in women at Survey 5, and around 24% at Survey 8 regardless of how well they reported managing on their income.²⁵

Use of LARCs was similar in women at Survey 5 (around 11%) regardless of whether they worked full-time, part-time or were not in the labour force. By Survey 8, about 25% of women who worked (full-time or part-time) used LARCs, while 17% of women who were not in the labour force did so.

Use of LARCs at Survey 5 (when the women were aged 31 to 36) was 11% in women who were born in Australia or another English speaking country, and had risen to about 25% by Survey 8 in these women.²⁶

Use of LARCs in women at Survey 5 was slightly higher in women who spoke English (11%) compared with speaking a European language (6%). By Survey 8, use of LARCs was reported by about 23% in of women regardless of the language they spoke at home.²⁷

LARC use by health risk behaviours

At Survey 5, use of LARCs was around 10% in women regardless of how much or whether they drank. By Survey 8, use was around 25% in women who drank at a low risk level, rarely drank or drank at risky levels, and was 18% in women who never drank.

LARCs were used by 10% of women at Survey 5 and about 25% of women at Survey 8 regardless of whether they currently or had ever smoked, by how much physical activity they did, by their BMI or by drug use.

Use of the withdrawal method and socioeconomic factors

²⁵ *There were too few women who reported that it was impossible to manage on their income to make meaningful interpretations.*

²⁶ *There were too few women born in Europe, Asia or another non-English speaking background country and who used LARCs to make meaningful interpretations.*

²⁷ *There were too few women who spoke Asian or another non-ESB language to make meaningful interpretations.*

At Surveys 4 and 8, use of the withdrawal method was about 10% for women regardless of where they lived, how much education they had attained²⁸, how well they reported managing on their income²⁹ or whether they worked full-time, part-time or were not in the labour force.

Use of the withdrawal method at Survey 4 was double that in women who were married or in a de facto relationship (about 12%), compared with women who were never married (6%). At Survey 8, the withdrawal method was used more by women who were in a de facto relationship (about 13%), than women who were married or never married (6%).³⁰

Use of the withdrawal method was around 11% in women at both Survey 4 and Survey 8 in women who were born in Australia or another English-speaking country.³¹

Use of the withdrawal method in women at Survey 4 was slightly higher in those who spoke a European language (17%) compared with speaking English (10%). By Survey 8, use remained higher in women speaking a European language (18%) compared with English (11%).³²

Use of the withdrawal method and health risk behaviours

Use of the withdrawal method was around 10% to 12% at Survey 4 and Survey 8 in women regardless of how much or whether they drank, whether they currently or had ever smoked, by how much physical activity they did or their BMI.

²⁸ *There were too few women with less than a year 12 level of education to make conclusions.*

²⁹ *There were too few women who found it impossible to manage on their income to make meaningful interpretations.*³⁰ *There were too few women who were separated, divorced or widowed to make meaningful interpretations.*

³⁰ *There were too few women who were separated, divorced or widowed to make meaningful interpretations.*

³¹ *There were too few women born in Europe, Asia or another non-English speaking background country and who used the withdrawal method to make meaningful interpretations.*

³² *There were too few women who spoke Asian or another non-English speaking background language to make meaningful interpretations.*

Use of the withdrawal method was higher in women at both Survey 4 and 8 if they had used illicit drugs (not including marijuana), at 15%. Use of the withdrawal method was lower in women who used marijuana regardless of when (around 11% at Surveys 4 and 8), and lowest in women who never used illicit drugs (around 7% at Surveys 4 and 8).

11.3.3 Use of emergency contraception

The total number of women in the 1973-78 cohort who reported using emergency contraception, in the six surveys which included this item, was 169.

- 43 at Survey 3 (when aged 25 to 30 years)
- 46 at Survey 4 (when aged 28 to 33 years)
- 26 at Survey 5 (when aged 31 to 36 years)
- 23 at Survey 6 (when aged 34 to 39 years)
- 17 at Survey 7 (when aged 37 to 42 years)
- 14 at Survey 8 (when aged 40 to 45 years).

General findings from the data from the two surveys with the highest prevalence, Surveys 3 and 4, suggested that women with a higher comparative use of emergency contraception were those who:

- Were never married, divorced or separated, compared with those who were partnered.
- Were risky drinkers, compared with those who consumed alcohol at less risky levels, or did not drink.
- Currently smoked, compared with those who did not or no longer smoked.
- Found it impossible to manage on their income, compared with those who found it easier.
- Who worked full-time, compared with those who worked part-time or were not in the paid labour force.
- Had not had children or a miscarriage, compared with those who had.
- Had had a previous pregnancy termination, compared with those who had not.

11.4 Appendix for chapter 4: The use of contraceptives following reproductive events

11.4.1 Measurement of reproductive events

Questions about reproductive events in 1989-95 cohort

At each of Surveys 1, 2, 3, 5 and 6 women were asked to indicate the number of times they had experienced various reproductive events. The types of events and response options are summarised in Table 11-9. There were only minor differences in the response options across surveys.

Table 11-9 Survey questions relating to reproductive events

	Survey 1	Survey 2, 3	Survey 5, 6
Reproductive events	Live birth	Live birth	Live birth
	Still birth	Still birth	Still birth
	Miscarriage	Miscarriage	Miscarriage
	Termination for medical reasons	Termination for medical reasons	Termination for medical reasons
	Termination for personal reasons	Termination for personal reasons	Termination for personal reasons
	Ectopic pregnancy	Ectopic pregnancy	Ectopic pregnancy

Response options	Yes, No, Don't know, I prefer not to answer	How many times have you had each of these? (free response)	How many times have you had each of these? (free response)
	How many have you had? (free response)		When did these occur? (month, year)

Questions about reproductive events in 1973-78 cohort

At each survey, women were asked to indicate the number of times they had experienced various reproductive events. The types of events and response options are summarised in Table 11-10. There were minor differences in the questions across surveys.

Table 11-10 Survey questions relating to reproductive events

	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5, 6	Surveys 7, 8
Reproductive events	Birth	Live birth	Live birth	Live birth	Live birth	
		Live premature birth	Live premature birth	Live premature birth		
		Still birth	Still birth	Still birth	Still birth	
	Miscarriage	Miscarriage	Miscarriage	Miscarriage	Miscarriage	Miscarriage

	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5, 6	Surveys 7, 8
	Termination	Termination	Termination	Termination for medical reasons	Termination for medical reasons	Termination for medical reasons
				Termination for other reasons	Termination for other reasons	Termination for other reasons
				Ectopic pregnancy	Ectopic pregnancy	Ectopic pregnancy
Response options	Never, Once, Twice	1, 2, 3, 4, 5 or more	1, 2, 3, 4, 5 or more	1, 2, 3, 4, 5 or more	1, 2, 3, 4, 5 or more	1, 2, 3, 4, 5 or more
	3 times, 4 or more times, Don't want to answer					
Reproductive events						Live birth
Response options						How many have you had in last 10 years?

	Survey 1	Survey 2	Survey 3	Survey 4	Survey 5, 6	Surveys 7, 8
Reproductive events					Premature birth	Premature birth Still birth
Response options					Response options: Never, 1 st child, 2 nd child...up to... 9 th child	Response options: Never, 1 st child, 2 nd child...up to... 9 th child

11.4.2 Use of emergency contraception

As described in Chapter 3, the total number of women in the 1973-78 cohort who reported using emergency contraception over the six surveys where it was asked was 169. Using data from the two surveys with the highest prevalence, Survey 3 (N = 43) and 4 (N = 46), general findings suggested that women with a higher comparative use of emergency contraception were those who:

- Had not had children or a miscarriage compared with those who had.
- Had had a previous pregnancy termination compared with those who had not.

11.4.3 Recoding reproductive events data

For the graphs in Chapter 4:

- Total number of live births up to the previous survey was used.
- Whether a woman had reported a reproductive event at the previous survey was used.
 - Therefore, if a woman indicated at Survey 3 that she had two miscarriages, and at Survey 5 reported three miscarriages, she was coded at Survey 5 as having had one at the previous survey.
 - While if a woman indicated at Survey 3 that she had two miscarriages, and at Survey 5 reported she had two miscarriages, she was coded at Survey 5 as not having had one at the previous survey.

Women's responses across surveys were analysed for logical consistency. Due to the longitudinal nature of the data, missing data and inconsistencies within these categories were recoded. The major assumptions underlying the recoding were:

- The total number of events could not decrease – it was assumed that an event, once reported, had indeed occurred.
- If all responses to a question were missing, all events were considered 'missing'.
- If an event was missing at Survey 1, and the response to that event at Survey 2 was 0, then the number of events at Survey 1 was set to 0.
- For all other surveys, if an event was missing, but had been answered at the previous survey, the prior value was carried across. If there is such a change, the

timing of the event was unknown so the count of the recoded variable may underestimate the true number of events. For example, if the number of events reported across three consecutive surveys is 2, then missing, then 4, the missing value could be 2, 3, or 4. The method used here would be to carry the value of 2 across surveys, with the risk of underestimating the total number of events at that time.

Table 11-11 Data used in Figure 4-1: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort with no children

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		2,584 (61.6)	2,558 (59.2)	2,516 (56.9)	2,001 (45.1)	1,560 (37.9)	11,219
Used condoms		1,896 (45.2)	1,851 (42.8)	1,761 (39.8)	1,639 (36.9)	1,339 (32.5)	8,486
Used Implanon		429 (10.2)	469 (10.9)	520 (11.8)	515 (11.6)	428 (10.4)	2,361
Used Mirena		86 (2.1)	127 (2.9)	188 (4.3)	389 (8.8)	568 (13.8)	1,358
Used other		138 (3.3)	138 (3.2)	160 (3.6)	190 (4.3)	207 (5.0)	833
Used none		330 (7.9)	370 (8.6)	388 (8.8)	595 (13.4)	703 (17.1)	2,386

Table 11-12 Data used in Figure 4-2: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had had one child up to that survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		37 (26.1)	29 (19.1)	32 (19.4)	48 (18.8)	70 (15.3)	216
Used condoms		52 (36.6)	42 (27.6)	50 (30.3)	68 (26.6)	110 (23.9)	322
Used Implanon		12 (8.5)	19 (12.5)	10 (6.1)	17 (6.6)	23 (5.0)	81
Used Mirena		10 (7.0)	11 (7.2)	9 (5.5)	21 (8.2)	38 (8.3)	89
Used other		9 (6.3)	8 (5.3)	13 (7.9)	15 (5.9)	24 (5.2)	69
Used none		45 (31.7)	57 (37.5)	67 (40.6)	106 (41.4)	210 (45.8)	485

Table 11-13 Data used in Figure 4-3: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had had two children up to that survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		8 (28.6)	13 (25.5)	20 (24.1)	22 (14.1)	39 (16.2)	102
Used condoms		4 (14.3)	15 (29.4)	24 (28.9)	47 (30.1)	62 (25.7)	152
Used Implanon		4 (14.3)	4 (7.8)	12 (14.5)	12 (7.7)	9 (3.7)	41
Used Mirena		1 (3.6)	3 (5.9)	5 (6.0)	14 (8.9)	34 (14.1)	57
Used other		3 (10.7)	2 (3.9)	2 (2.4)	12 (7.7)	25 (10.4)	44
Used none		9 (32.1)	16 (31.4)	23 (27.7)	58 (37.2)	80 (33.2)	186

Table 11-14 Data used in Figure 4-4: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had not experienced any reproductive event at the previous survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		2,488 (63.1)	2,565 (58.5)	2,515 (56.1)	2,015 (44.6)	1,575 (37.3)	11,158
Used condoms		1,815 (46.1)	1,859 (42.4)	1,775 (39.6)	1,653 (36.6)	1,360 (32.2)	8,462
Used Implanon		385 (9.8)	468 (10.7)	531 (11.8)	522 (11.6)	437 (10.3)	2,343
Used Mirena		78 (1.9)	140 (3.2)	194 (4.3)	397 (8.8)	590 (13.9)	1,399
Used other		118 (2.9)	137 (3.1)	161 (3.6)	199 (4.4)	218 (5.2)	833
Used none		282 (7.2)	397 (9.1)	422 (9.4)	630 (13.9)	732 (17.3)	2,463

Table 11-15 Data used in Figure 4-5: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had any reproductive event at the previous survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		143 (33.1)	36 (23.8)	57 (28.4)	60 (16.7)	100 (14.9)	396
Used condoms		143 (33.1)	50 (33.1)	63 (31.3)	106 (29.5)	165 (24.6)	527
Used Implanon		60 (13.9)	24 (15.9)	12 (5.9)	24 (6.7)	29 (4.3)	149
Used Mirena		20 (4.6)	4 (2.7)	12 (5.9)	31 (8.6)	61 (9.1)	128
Used other		32 (7.4)	11 (7.3)	15 (7.5)	22 (6.1)	51 (7.6)	131
Used none		104 (24.1)	50 (33.1)	61 (30.4)	143 (39.8)	291 (43.4)	649

Table 11-16 Data used in Figure 4-6: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a live birth at the previous survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		47 (26.1)	9 (16.9)	18 (18.4)	22 (12.9)	64 (13.8)	160
Used condoms		62 (34.4)	17 (32.1)	35 (35.7)	53 (31.2)	117 (25.3)	284
Used Implanon		16 (8.9)	6 (11.3)	6 (6.1)	8 (4.7)	24 (5.2)	60
Used Mirena		12 (6.7)	0	5 (5.1)	11 (6.5)	37 (7.9)	65
Used other		12 (6.7)	5 (9.4)	9 (9.2)	10 (5.9)	37 (7.9)	73
Used none		57 (31.7)	19 (35.9)	30 (30.6)	76 (44.7)	198 (42.8)	380

Table 11-17 Data used in Figure 4-7: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a miscarriage at the previous survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		41 (29.3)	19 (33.3)	21 (35.6)	23 (20.7)	21 (12.3)	125
Used condoms		44 (31.4)	19 (33.3)	18 (30.5)	27 (24.3)	43 (25.2)	151
Used Implanon		16 (11.4)	8 (14.0)	2 (3.4)	5 (4.5)	2 (1.2)	33
Used Mirena		7 (5.0)	1 (1.8)	0	7 (6.3)	8 (4.7)	23
Used other		15 (10.7)	4 (7.0)	4 (6.8)	7 (6.3)	7 (4.1)	37
Used none		41 (29.3)	20 (35.1)	22 (37.3)	53 (47.8)	97 (56.7)	233

Table 11-18 Data used in Figure 4-8: Use of contraceptive methods from Survey 1 to Survey 6 among women in the 1989-95 cohort who had a termination at the previous survey

Contraceptive method	N (%)	S1	S2	S3	S5	S6	Total
Used OCP		77 (38.9)	11 (24.4)	19 (39.6)	19 (18.5)	21 (19.4)	147
Used condoms		60 (30.3)	14 (31.1)	12 (25.0)	33 (32.0)	28 (25.9)	147
Used Implanon		37 (18.7)	11 (24.4)	4 (8.3)	12 (11.7)	4 (3.7)	68
Used Mirena		8 (4.0)	3 (6.7)	7 (14.6)	15 (14.6)	17 (15.7)	50
Used other		15 (7.6)	2 (4.4)	2 (4.2)	7 (6.8)	11 (10.2)	37
Used none		32 (16.2)	11 (24.4)	11 (22.9)	26 (25.2)	33 (30.6)	113

Table 11-19 Data used in Figure 4-9: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort with no children

Contraceptive method	N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP		1,817 (46.9)	2,006 (57.3)	1,682 (56.8)	986 (47.8)	547 (39.8)	310 (33.2)	175 (24.9)	115 (19.8)	7,638
Used condoms		749 (19.3)	955 (27.3)	1001 (33.8)	715 (34.7)	446 (32.4)	271 (28.9)	162 (23.0)	131 (22.6)	4,430
Used LARC		-	-	-	-	77 (5.6)	78 (8.3)	67 (9.5)	84 (14.5)	306
Used withdrawal		-	-	-	189 (9.2)	144 (10.5)	75 (8.0)	55 (7.8)	52 (8.9)	515
Used fertility awareness period		-	-	-	-	37 (2.7)	28 (2.9)	19 (2.7)	16 (2.8)	100
Used none		1,204 (31.1)	623 (17.8)	639 (21.6)	450 (21.8)	392 (28.5)	327 (34.9)	301 (42.8)	239 (41.2)	4,175

Table 11-20 Data used in Figure 4-10: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had had one child up to that survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	55 (45.1)	124 (44.3)	180 (41.9)	223 (36.4)	151 (26.4)	107 (22.8)	86 (22.6)	76 (20.2)	1,002
Used condoms	27 (22.1)	74 (26.4)	125 (29.1)	183 (29.9)	181 (31.6)	123 (26.2)	77 (20.2)	72 (19.1)	862
Used LARC	-	-	-	-	39 (6.8)	37 (7.9)	48 (12.6)	60 (15.9)	184
Used withdrawal	-	-	-	75 (12.2)	68 (11.9)	45 (9.6)	36 (9.5)	26 (6.9)	250
Used fertility awareness period	-	-	-	-	33 (5.8)	15 (3.2)	15 (3.9)	7 (1.9)	70
Used none	29 (23.8)	60 (21.4)	121 (28.1)	153 (24.9)	176 (30.8)	188 (40.1)	160 (41.9)	156 (41.4)	1,043

Table 11-21 Data used in Figure 4-11: Use of contraceptive methods from Survey 2 to Survey 8 among women in the 1973-78 cohort who had had two children up to that survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	13 (50.0)	58 (41.7)	129 (36.9)	237 (40.8)	353 (37.2)	376 (34.1)	291 (26.6)	213 (20.4)	1,670
Used condoms	3 (11.5)	43 (30.9)	91 (26.0)	189 (32.5)	280 (29.5)	323 (29.3)	281 (25.6)	242 (23.2)	1,452
Used LARC	-	-	-	-	173 (18.2)	234 (21.2)	277 (25.3)	324 (31.1)	1,008
Used withdrawal	-	-	-	68 (11.7)	112 (11.8)	119 (10.8)	133 (12.1)	122 (11.7)	554
Used fertility awareness period	-	-	-	-	58 (6.1)	62 (5.6)	58 (5.3)	52 (4.9)	230
Used none	6 (23.1)	21 (15.1)	101 (28.9)	70 (12.1)	111 (11.7)	145 (13.1)	166 (15.2)	190 (18.3)	810

Table 11-22 Data used in Figure 4-12: Use of contraceptive methods from Survey 2 to Survey 8 among women in the 1973-78 cohort who had had three or more children up to that survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	4 (28.6)	6 (15.8)	26 (23.6)	66 (36.7)	90 (26.8)	138 (27.2)	126 (22.2)	97 (17.1)	553
Used condoms	3 (21.4)	5 (13.2)	23 (20.9)	46 (25.6)	104 (30.9)	158 (31.1)	163 (28.8)	152 (26.9)	654
Used LARC	-	-	-	-	53 (15.8)	108 (21.3)	149 (26.3)	158 (27.9)	468
Used withdrawal	-	-	-	28 (15.6)	50 (14.9)	74 (14.6)	81 (14.3)	79 (13.9)	312
Used fertility awareness period	-	-	-	-	36 (10.7)	39 (7.7)	41 (7.2)	35 (6.2)	151
Used none	0	8 (21.1)	43 (39.1)	28 (15.6)	53 (15.8)	65 (12.8)	81 (14.3)	109 (19.3)	387

Table 11-23 Data used in Figure 4-13: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had no reproductive event at the previous survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	1,716 (46.1)	1,910 (57.5)	1,689 (56.3)	1,066 (47.4)	743 (39.3)	627 (34.4)	574 (27.6)	428 (20.2)	8,753
Used condoms	722 (19.4)	886 (26.7)	992 (33.0)	757 (33.7)	560 (29.6)	507 (27.8)	507 (24.3)	494 (23.3)	5,425
Used LARC	-	-	-	-	205 (10.9)	296 (16.2)	446 (21.4)	550 (25.9)	1,497
Used withdrawal				201 (8.9)	200 (10.6)	155 (8.5)	215 (10.3)	225 (10.6)	996
Used fertility awareness period					58 (3.1)	64 (3.5)	90 (4.3)	90 (4.2)	302
Used none	1,197 (32.1)	601 (18.1)	658 (21.9)	472 (21.0)	453 (23.9)	443 (24.3)	483 (23.2)	531 (25.0)	4,838

Table 11-24 Data used in Figure 4-14: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had any reproductive event at the previous survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	195 (54.6)	284 (44.5)	328 (38.7)	446 (37.5)	399 (29.6)	304 (25.5)	104 (15.6)	73 (16.5)	4,546
Used condoms	69 (19.3)	191 (29.9)	248 (29.3)	376 (31.6)	453 (33.6)	368 (30.9)	176 (26.4)	103 (23.3)	1,984
Used LARC	-	-	-	-	138 (10.2)	161 (13.5)	95 (14.3)	76 (17.2)	470
Used withdrawal	-	-	-	159 (13.4)	174 (12.9)	158 (13.3)	90 (13.5)	54 (12.2)	635
Used fertility awareness period	-	-	-	-	106 (7.9)	80 (6.7)	43 (6.5)	20 (4.5)	249
Used none	51 (14.3)	111 (17.4)	246 (29.0)	229 (19.3)	279 (20.7)	282 (23.7)	225 (33.8)	163 (36.8)	1,586

Table 11-25 Data used in Figure 4-15 Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a live birth at the previous survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	69 (45.1)	149 (41.9)	247 (36.9)	388 (37.4)	370 (30.3)	285 (26.7)	86 (16.5)	57 (17.3)	1,651
Used condoms	32 (20.9)	99 (27.8)	195 (29.2)	330 (31.8)	417 (34.2)	345 (32.3)	148 (28.4)	80 (24.3)	1,646
Used LARC	-	-	-	-	128 (10.5)	143 (13.4)	75 (14.4)	58 (17.6)	404
Used withdrawal	-	-	-	146 (14.1)	159 (13.0)	147 (13.8)	75 (14.4)	44 (13.4)	571
Used fertility awareness period	-	-	-	-	99 (8.1)	74 (6.9)	38 (7.3)	19 (5.8)	230
Used none	30 (19.6)	67 (18.8)	191 (28.6)	183 (17.7)	227 (18.6)	225 (21.1)	156 (29.9)	110 (33.4)	1,189

Table 11-26 Data used in Figure 4-16: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a miscarriage at the previous survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	40 (46.5)	52 (40.6)	51 (32.7)	66 (32.0)	71 (26.3)	48 (19.5)	21 (10.1)	22 (14.0)	371
Used condoms	16 (18.6)	38 (29.7)	51 (32.7)	64 (31.1)	74 (27.4)	63 (25.6)	40 (19.2)	31 (19.8)	377
Used LARC	-	-	-	-	17 (6.3)	24 (9.8)	22 (10.6)	19 (12.1)	82
Used withdrawal	-	-	-	18 (8.7)	30 (11.1)	23 (9.4)	26 (12.5)	15 (9.6)	112
Used fertility awareness period	-	-	-	-	32 (11.9)	16 (6.5)	11 (5.3)	7 (4.5)	66
Used none	15 (17.4)	33 (25.8)	57 (36.5)	65 (31.6)	88 (32.6)	97 (39.4)	106 (50.9)	79 (50.3)	540

Table 11-27 Data used in Figure 4-17: Use of contraceptive methods from Survey 1 to Survey 8 among women in the 1973-78 cohort who had experienced a termination at the previous survey

Contraceptive method									
N (%)	S1	S2	S3	S4	S5	S6	S7	S8	Total
Used OCP	107 (58.5)	107 (47.8)	55 (51.4)	49 (41.9)	27 (33.3)	13 (18.6)	10 (14.9)	10 (18.2)	378
Used condoms	35 (19.1)	78 (34.8)	32 (29.9)	32 (27.4)	29 (35.8)	19 (27.1)	22 (32.8)	15 (27.3)	262
Used LARC	-	-	-	-	12 (14.8)	15 (21.4)	14 (20.9)	11 (20.0)	52
Used withdrawal	-	-	-	10 (8.6)	9 (11.1)	8 (11.4)	9 (13.4)	6 (10.9)	42
Used fertility awareness period	-	-	-	-	2 (2.5)	1 (1.4)	2 (2.9)	0	5
Used none	18 (9.8)	25 (11.2)	25 (23.4)	28 (23.9)	18 (22.2)	22 (31.4)	15 (22.4)	16 (29.1)	167

11.5 Appendix for Chapter 6

11.5.1 PBS data on oral contraceptives before and after 2012

Prior to July 2012, the PBS did not include data on scripts that fell below the co-payment threshold, and so prescriptions for oral contraceptives prior to July 2012 may be underestimated in the PBS data. Figure 11-1 illustrates this issue by showing the large jump in the percentage of women who had a PBS prescription for an OCP before and after 2012. Even post 2012, not all OCPs are listed on the PBS, especially the newer generation pills. The PBS may therefore underestimate oral contraceptive use, even after 2012.

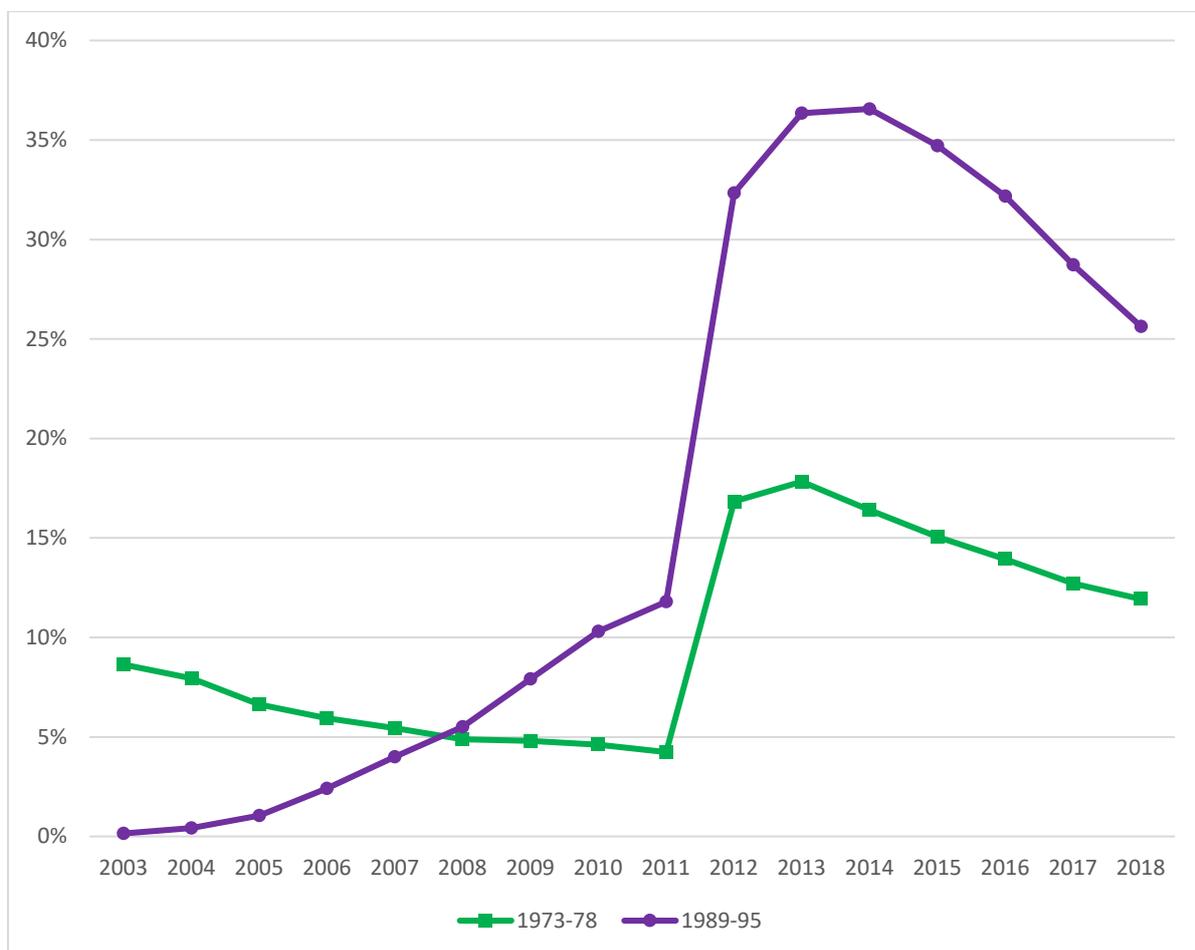


Figure 11-1 Percentage of women in the 1973-78 and 1989-95 cohorts who had at least one OCP script recorded in the PBS data (data graphed where an entire year of data was available).

11.5.2 OCP items listed on the PBS 2002-2019

Table 11-28 OCP items listed on the PBS

CONTRACEPTIVE	PBS ITEM NUMBER	DESCRIPTION
Progestogen only pills	1967M	Noriday 28, Locilan 28 Day, Micronor
	2913H	Microlut, Microval 28
Combined OCPs	1392G	Logynon ED, Trifeme 28, Triphasil 28, Triquilar ED
	1456P	Microgynon 50 ED
	2774B	Brevinor, Norimin 28 day
	2775C	Norimin-1 28 day, Brevinor-1
	3179H	Norinyl-1/28
	1394J	Eleanor 150/30 ED, Evelyn 150/30 ED, Femme-Tab ED 30/150, Lenest 30 ED, Micronelle 30 ED, Monofeme 28, Levlen ED, Nordette 28, Microgynon 30 ED
	2416E	Femme Tab ED 20/100
	2776D	Improvil 28 Day, Synphasic 28
	1393H	Microgynon 30
	1458R	Sequilar ED

Note: these are all the items that were listed after 2002

11.5.3 ALSWH survey items that collect data on contraceptive use

The questions regarding contraception use differ slightly between the 1989-95 cohort and the 1973-78 cohort surveys.

In the 1989-95 cohort surveys, the question reads:

*Thinking about the LAST TIME you had vaginal sex, did you use any of the following?
With one OCP response option: The Pill*

The 1989-95 cohort Survey 4 did not ask about contraceptive use.

In the 1973-78 cohort surveys, the question reads:

What forms of contraception do you use now? With three OCP response options:

I use a combined oral contraceptive pill (The Pill)

I use a progestogen only oral contraception pill (The Mini Pill)

I use the oral contraceptive pill, but I don't know what type

(For the purposes of this report, these three response options were collapsed into a single response indicating OCP use.)

11.5.4 Women who reported using an OCP in an ALSWH survey who also had a PBS prescription in the year prior to the survey

In the 1989-95 cohort, around 60% of the women who indicated on the surveys that they were using an OCP had a PBS script for oral contraceptives supplied in the year prior to survey completion. This proportion is consistent across surveys.

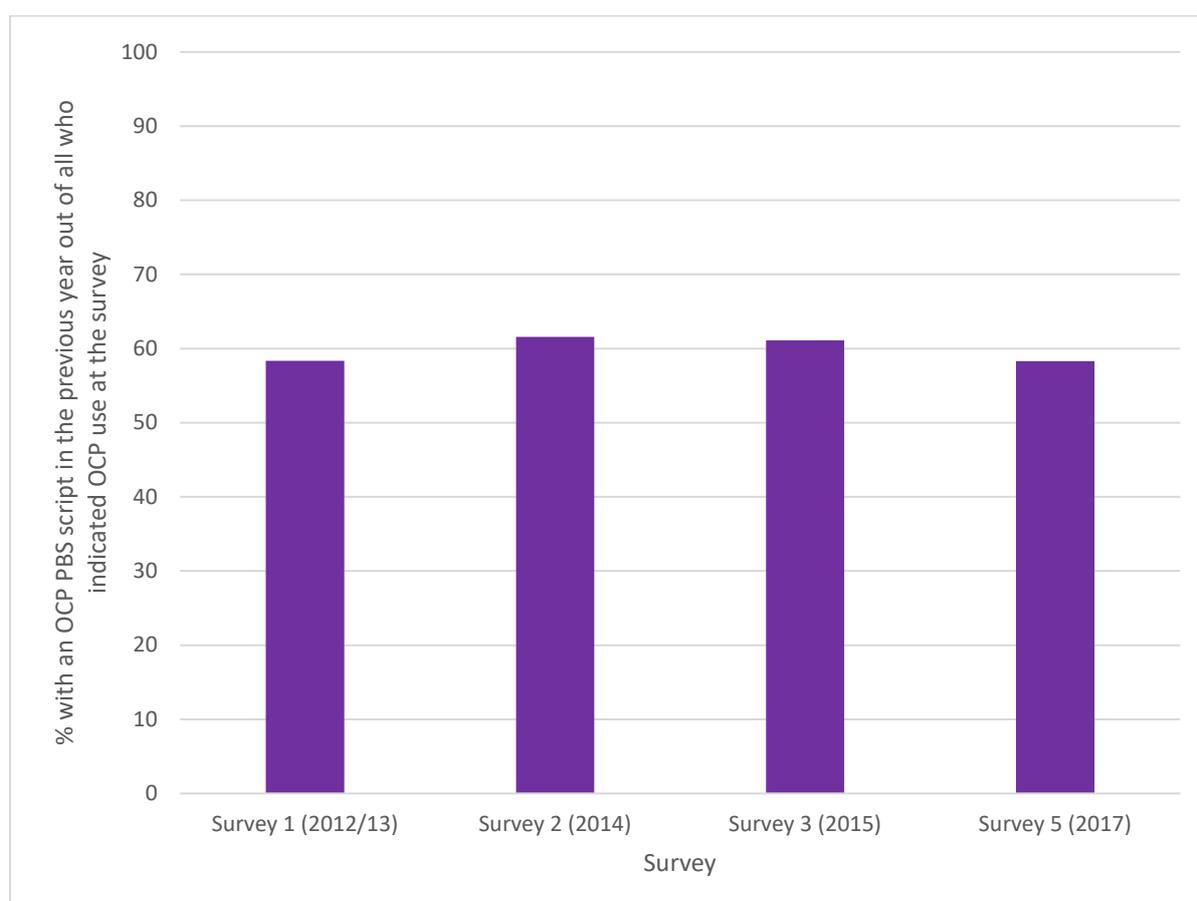


Figure 11-2 The percentage of women in the 1989-95 cohort who had a PBS script for an OCP supplied in the year prior to indicating OCP use in an ALSWH survey.

The 1973-78 cohort had a slightly higher percentage of women who were supplied a PBS script for an OCP prior to indicating their use in an ALSWH survey, for the surveys not affected by the PBS co-payment issue (i.e., Surveys 7 and 8). In these surveys, 65-70% of women who indicated in the survey that they were using an OCP had a PBS script supplied to them in the previous year.

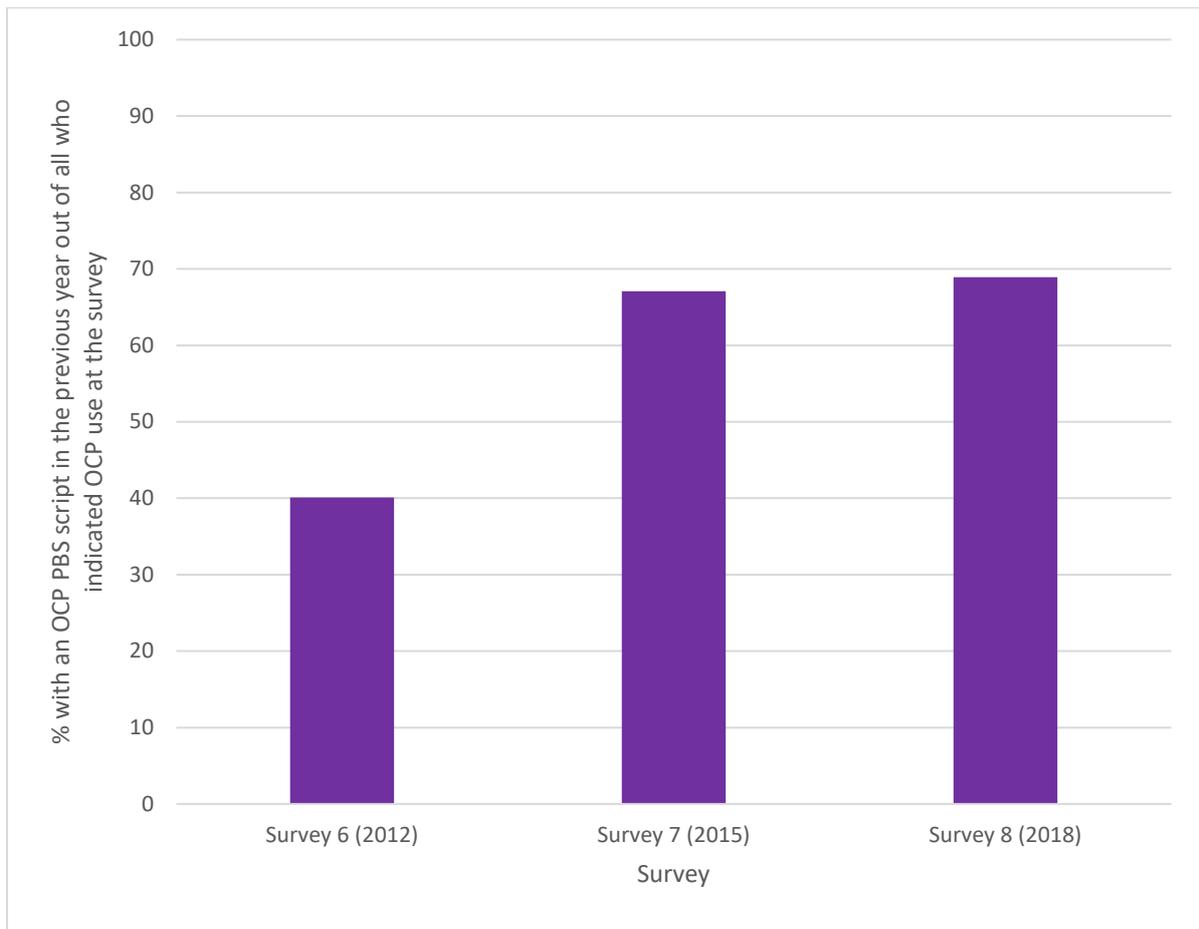


Figure 11-3 The percentage of women in the 1973-78 cohort who had a PBS script for an OCP supplied in the year prior to indicating OCP use in an ALSWH survey.

11.5.5 Women who were identified as having an OCP PBS prescription who also reported OCP use in an ALSWH survey

In the 1989-95 cohort, around 75% of women who had an OCP PBS script supplied in the year prior to completing an ALSWH survey also reported OCP use in the ALSWH survey.

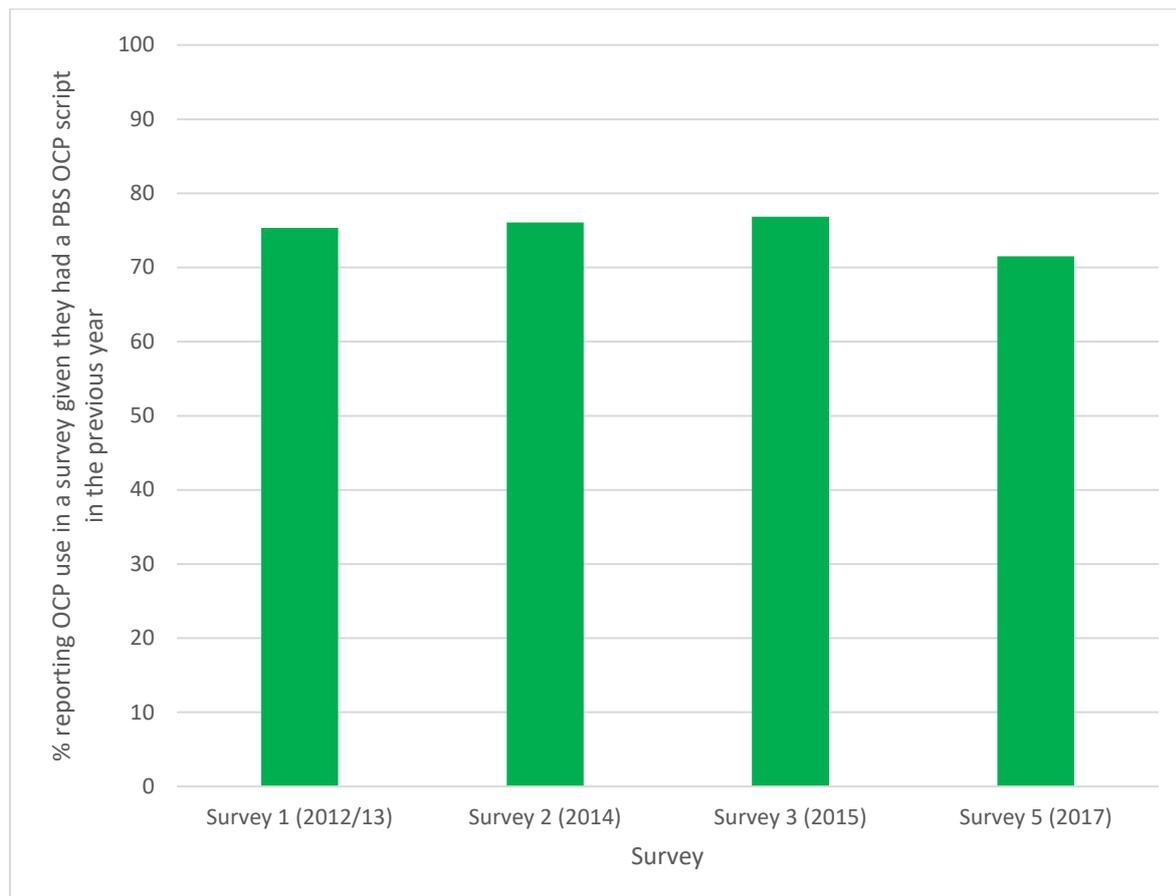


Figure 11-4 The percentage of women in the 1989-95 cohort that reported OCP use in a survey after being supplied an OCP script through the PBS in the previous year.

In the 1973-78 cohort around 70% of women who were supplied with an OCP prescription in the year prior to survey completion reported OCP use in the ALSWH survey. Note that for many women who completed Survey 6, which was administered in 2012, PBS scripts obtained in the previous year would have included the period when scripts below the co-payment were not recorded, which may account for the higher percentage at Survey 6.

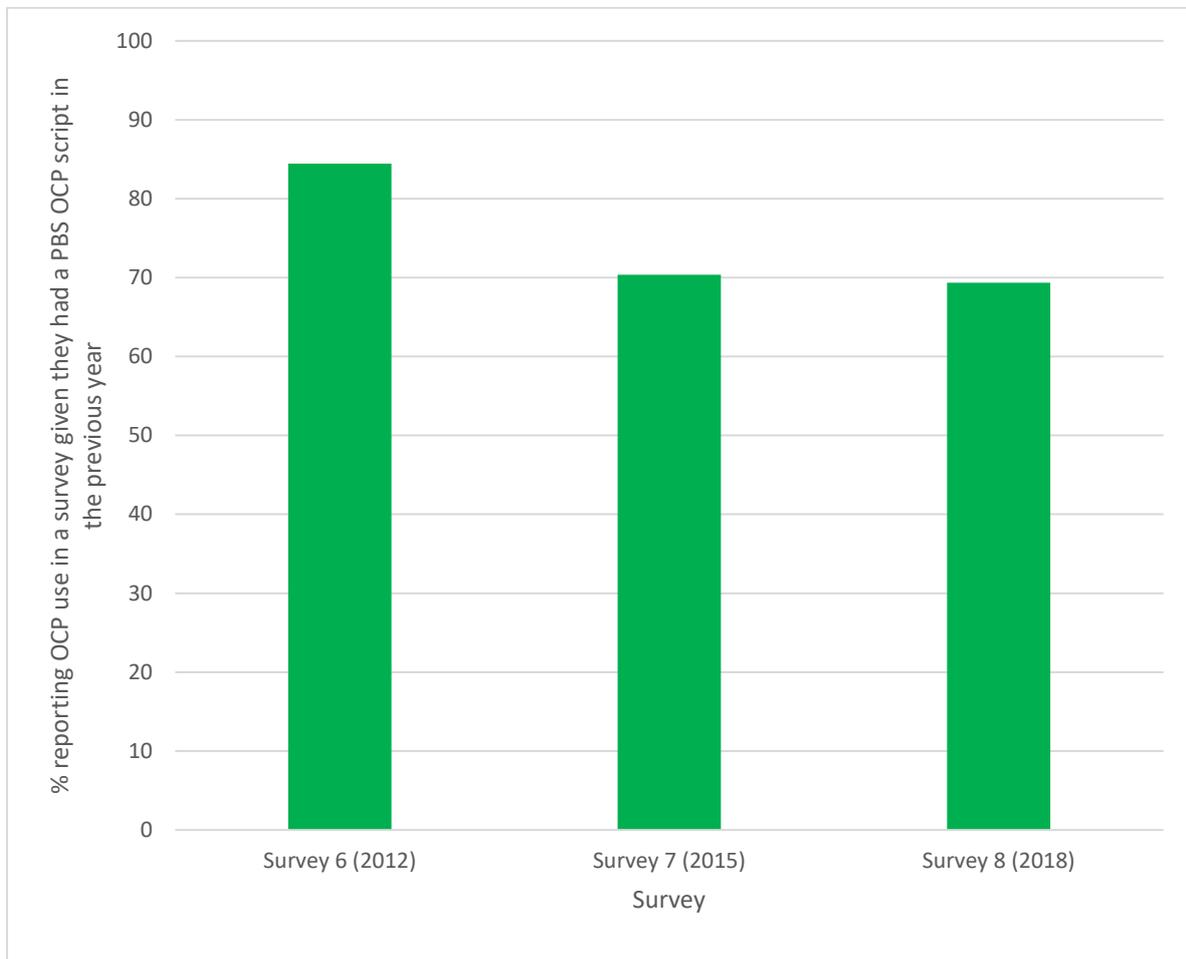


Figure 11-5 The percentage of women in the 1973-78 cohort that reported OCP use in a survey after being supplied an OCP script through the PBS in the previous year.

11.5.6 Agreement between ALSWH Survey and PBS reports of OCP use across surveys

Table 11-29 Agreement between survey and PBS reports of OCP use for the 1989-95 cohort across surveys

1989-95 Cohort		Had an OCP PBS script in the year before indicating OCP use in an ALSWH survey?			
		No		Yes	
Survey	OCP use reported at survey	<i>N</i>	%	<i>N</i>	%
Survey 1 (2013)	No	7,664	83.7	1,496	16.3
	Yes	3,262	41.6	4,571	58.4
Survey 2 (2014)	No	4,958	82.7	1,037	17.3
	Yes	2,053	38.4	3,294	61.6
Survey 3 (2015)	No	3,984	83.7	774	16.3
	Yes	1,635	38.9	2,568	61.1
Survey 5 (2017)	No	4,487	85.6	756	14.4
	Yes	1,355	41.7	1,897	58.3

Table 11-30 Agreement between survey and PBS reports of OCP use for the 1973-78 cohort across surveys

1973-78 Cohort		Had an OCP PBS script in the year before indicating OCP use in an ALSWH survey?			
		No		Yes	
Survey	OCP use reported at survey	<i>N</i>	%	<i>N</i>	%
<i>Survey 6 (2012)</i>	No	5,654	97.8	128	2.2
	Yes	1,036	59.9	694	40.1
<i>Survey 7 (2015)</i>	No	5,324	94.2	326	5.8
	Yes	380	32.9	774	67.1
<i>Survey 8 (2018)</i>	No	5,643	95.5	264	4.5
	Yes	269	31.1	597	68.9

11.5.7 Demographic and health risk factor differences by OCP user status (all results)

Table 11-31 Demographic, health behaviour and health risk factors by OCP use for the 1973-78 cohort at Survey 7 (2015)

1973-78 cohort	Type of OCP user						P
	PBS user		Survey user		Non-user		
	N =	%=	N =	%=	N =	%=	
	Mean	StdDev	Mean	StdDev	Mean	StdDev	
	1,676	21.2	424	5.4	5,807	73.4	
Age	39.5	1.5	39.3	1.4	39.7	1.5	<.0001
MH	71.4	16.8	71.3	17.3	71.4	17.1	0.9878
BMI	27.2	6.5	26.4	6.1	27.2	6.7	0.0609
METMIN	1,039.0	1,378.9	1,260.0	1,653.4	1,052.1	1,418.8	0.0008
Number of children	1.7	1.2	1.4	1.2	1.8	1.2	<.0001
	N	%	N	%	N	%	P
Area of Residence (ARIA+)							0.0004
<i>Major City</i>	920	54.9	246	58.0	3,249	56.0	
<i>Inner regional</i>	440	26.3	102	24.1	1,538	26.5	
<i>Outer regional/remote</i>	306	18.3	43	10.1	828	14.3	
Self-rated general health							0.0083
<i>Excellent/Good</i>	1,456	86.9	389	91.8	5,173	89.2	
<i>Fair/poor</i>	214	12.8	35	8.3	617	10.6	
Smoking status							0.0037
<i>Never smoker</i>	987	58.9	288	67.9	3,377	58.2	
<i>Ex-smoker</i>	456	27.2	108	25.5	1,599	27.5	
<i>Current smoker</i>	178	10.6	25	5.9	629	10.8	
Pattern of alcohol consumption							0.0001
<i>Low long-term risk, drinks at short-term risk less than weekly</i>	1,276	76.1	330	77.8	4,339	74.7	
<i>Non-drinker</i>	138	8.2	33	7.8	633	10.9	
<i>Low long-term risk, drinks at short-term risk weekly or more</i>	75	4.5	34	8.0	277	4.8	
<i>Risky/high risk drinker</i>	133	7.9	26	6.1	358	6.2	
Illicit drug use in the past 12 months							0.0974
No	1,525	91.0	397	93.6	5,362	92.3	
Yes	151	9.0	27	6.4	445	7.7	

1973-78 cohort	Type of OCP user						P
	PBS user		Survey user		Non-user		
	N =	%=	N =	%=	N =	%=	
	Mean	StdDev	Mean	StdDev	Mean	StdDev	
Education level							<.0001
<i>School based qualification or below</i>	223	13.3	43	10.1	644	11.1	
<i>Certificate or Diploma</i>	600	35.8	99	23.4	1,805	31.1	
<i>University degree</i>	853	50.9	282	66.5	3,358	57.8	
Partnered							0.0023
<i>No</i>	346	20.6	111	26.2	1,086	18.7	
<i>Yes</i>	1,255	74.9	307	72.4	4,394	75.7	
Ability to manage on income							0.0011
<i>Impossible/difficult</i>	736	43.9	150	35.4	2,372	40.9	
<i>Easy/not too bad</i>	868	51.8	268	63.2	3,108	53.5	
Country of birth							<.0001
<i>Australia</i>	1,601	95.5	398	93.9	5,333	91.8	
<i>Other English-speaking country</i>	40	2.4	10	2.4	236	4.1	
<i>Non-English-speaking country</i>	27	1.6	10	2.4	204	3.5	
Ever been in a violent relationship							0.0835
<i>No</i>	1,332	79.5	364	85.9	4,653	80.1	
<i>Yes</i>	261	15.6	51	12.0	808	13.9	
Previous termination							0.0487
<i>No</i>	1,365	81.4	343	81.0	4,577	78.8	
<i>Yes</i>	311	18.6	81	19.1	1,230	21.2	
Previous miscarriage							<.0001
<i>No</i>	1,125	67.1	317	74.8	3,747	64.5	
<i>Yes</i>	551	32.9	107	25.2	2,060	35.5	

Note: Percentages do not add to 100 as missing data are not displayed. Chi-square and Kruskal-Wallis tests used to compare across groups

Table 11-32 Demographic, health behaviour and health risk factors by OCP use for the 1989-95 cohort at Survey 5 (2015)

1989-95 Cohort	Type of OCP user						P
	PBS user		Survey user		Non-user		
	N = 5,035	% = 43	N = 1,896	% = 16.2	N = 4,778	% = 40.8	
	Mean	StdDev	Mean	StdDev	Mean	StdDev	
Kessler psychological distress scale score	21.5	7.7	21.0	7.6	22.1	8.1	<.0001
BMI	22.9	1.7	23.1	1.7	23.1	1.7	<.0001
Physical activity (metabolic minutes in previous week)	1,450	1,648	1,480	1,483	1,477	1,728	<.0001
Age	23	1.7	23	1.7			
No. of children	0.1	0.4	0.0.	0.2	0.2	0.6	<.0001
	N	%	N	%	N	%	P
Area of Residence (ARIA+)							<.0001
<i>Major city</i>	3,666	72.8	1,481	78.1	3,479	72.8	
<i>Inner regional</i>	950	18.9	263	13.9	798	16.7	
<i>Outer regional/remote</i>	381	7.6	117	6.2	415	8.7	
Self-rated general health							<.0001
<i>Excellent/good</i>	4,177	83.0	1,636	86.3	3,912	81.9	
<i>Fair/poor</i>	858	17.0					
Smoking status							<.0001
<i>Never smoker</i>	3,718	73.8	1,484	78.3	3,393	71.0	
<i>Ex-smoker</i>	421	8.4	149	7.9	444	9.3	
<i>Current smoker</i>	872	17.3	262	13.8	908	19	
Pattern of alcohol consumption							<.0001
<i>Low long-term risk (drinks at short-term risk less than weekly)</i>	4,156	82.5	1,594	84.1	3,713	77.7	
<i>Non-drinker</i>	279	5.5	89	4.7	551	11.5	
<i>Low long-term risk (drinks at short-term risk weekly or more)</i>	448	8.9	171	9.0	337	7.1	
<i>Risky/high risk drinker</i>	128	2.5	41	2.2	138	2.9	

1989-95 Cohort	Type of OCP user						P
	PBS user		Survey user		Non-user		
	N = 5,035	% = 43	N = 1,896	% = 16.2	N = 4,778	% = 40.8	
	Mean	StdDev	Mean	StdDev	Mean	StdDev	
Illicit drug use in the past 12 months							0.0965
No	3,339	66.3	1,247	65.8	3,251	68.0	
Yes	1,696	33.7	649	34.2	1,527	32.0	
Education level							<.0001
School based qualification or below	1,537	30.5	487	25.7	1,438	30.1	
Certificate or Diploma	1,472	29.2	434	22.9	1,504	31.5	
University degree	1,880	37.3	920	48.5	1,671	35.0	
Partnered							0.0023
Yes	3,237	64.3	1,298	68.5	3,146	65.8	
No	1,650	32.8	542	28.6	1,466	30.7	
Ability to manage on income							<.0001
Impossible/difficult	2,717	54.0	913	48.2	2,576	53.9	
Easy/not too bad	2,170	43.1	927	48.9	2,036	42.6	
Country of birth							<.0001
Australia	4,202	83.5	1,507	79.5	3,756	78.6	
Other English speaking country	182	3.6	106	5.6	204	4.3	
Non-English speaking country	73	1.5	47	2.5	157	3.3	
Ever been in a violent relationship							<.0001
Yes	4,426	87.9	1,713	90.4	4,086	85.5	
No	609	12.1	183	9.7	692	14.5	
Previous termination							<.0001
No	4,426	94.6	1,799	94.9	4,330	90.6	
Yes	272	12.1	97	5.1	448	9.4	
Previous miscarriage							>.0001
No	4,743	94.2	1,822	96.1	4,374	91.5	
Yes	292	5.8	74	3.9	404	8.5	

Note: Percentages do not add to 100 as missing data are not displayed. Chi-square and Kruskal-Wallis tests used to compare across groups

11.5.8 Identifying continual periods of use of OCPs through the PBS

PBS data provide specific details on prescription supply dates, allowing detailed information on duration of use. PBS data also provide information on the pack size (number of pills) and the number of packs supplied in each script. Using these two pieces of information, we can calculate the total number of OCPs supplied over a given time period.

We have identified each period of continuous use of OCP as determined by the percentage of days (PDC) covered by prescriptions (APhA, 2020). This percentage is defined as:

$$PDC = \frac{\text{Number of pills supplied in period}}{\text{Number of days in period}}$$

High adherence to continuous use of combined oral contraceptive is usually defined by a PDC very close to 1, with some studies suggesting anything greater than one or two days in a month *without* a pill to define lack of adherence. Nelson (2017) uses a minimum PDC of 96.4% (27/28) and Triebwasser (2015) uses 93.4% (28/30) as a minimum to indicate adherence to oral contraceptives. These levels of PDC are based on optimal use, however using these levels, Nelson found only 68% of women were adherent and younger women were significantly less likely to be adherent.

For this report, we have applied a PDC level of 0.8. This lower threshold will capture continual users over potentially long observation periods and allow for some discrepancy between prescription supply and medication use.

The start date of a period of use was the first script supplied in the observation period, or the first script supplied after the end of a previous period of use. The last script date in a period was defined as the supply date of the script *before* any script where:

$$\frac{\text{Date of script} - \text{Date of first script in period}}{\text{Total number of pills supplied from first script to current script}} < 0.8$$

Then the end date of a period of use was defined as the last script date plus (10/8) multiplied by the number of pills supplied in the final script. Using this definition, women

can have multiple periods of use with the length (number of days) of use defined by the end date – start date.

The observation period to define periods of continual use of OCP’s through the PBS was set as 1 January 2013 – 30 June 2019. The 30 June 2019 is the final date of data collection in the PBS data used, so periods of use that were ongoing as of 30 June 2019 had their end date set to this date as it is not possible to know how long after this date the periods of use extended. Periods of use that began *before* 1 January 2013 were excluded because these periods could have potentially begun much earlier, but due to the co-payment issue we cannot be certain about their start date.

In the 1989-95 cohort, there were 11,089 periods of OCP use across 7275 users (average 1.5 periods of use per woman). In the 1973-78 cohort there were 2440 periods of OCP use identified through the PBS across 1696 distinct users (average 1.4 periods of use per woman). Note: periods of use were only counted if they began within three years of completing an ALSWH survey. This enables sociodemographic and health factors taken from the survey to be used in the analysis of the OCP information. Due to this, these periods of use do not necessarily constitute prevalence of use measures.

Considering each period of use, we have calculated the duration of OCP use (Table 11-33), with a median of around 220-230 days for each period. However, note that periods of use that were ongoing as of 30 June 2019 are censored, and use may be underestimated in these cases.

Table 11-33 Summary statistics for days of OCP use identified through the PBS.

Cohort	Unique users	Periods of use	% Censored*	Min days on OCP**	Max days on OCP	Median days on OCP	25 th Percentile	75 th Percentile
1989-95	7,275	11,089	15.3	1	2,341	222	140	543
1973-78	1,696	2,440	16.6	3	2,369	231	140	617

*Can be interpreted as the % of periods of use that did not end during the observation period

**Minimum days use can be very short if a period of use began just before the end of the data coverage (1st July 2019) – these would be censored.

Figure 11-6 provides a graphical representation of the duration of each period of OCP use. For both cohorts, a large proportion (almost 50%) of periods of use are exactly 140 days long. This can be seen by the large straight-line drop. This equates to a single script supplied with 112 pills (four 28 pill packs) with at least 80% of days covered (PDC=0.8) and no second script at the end of this period.

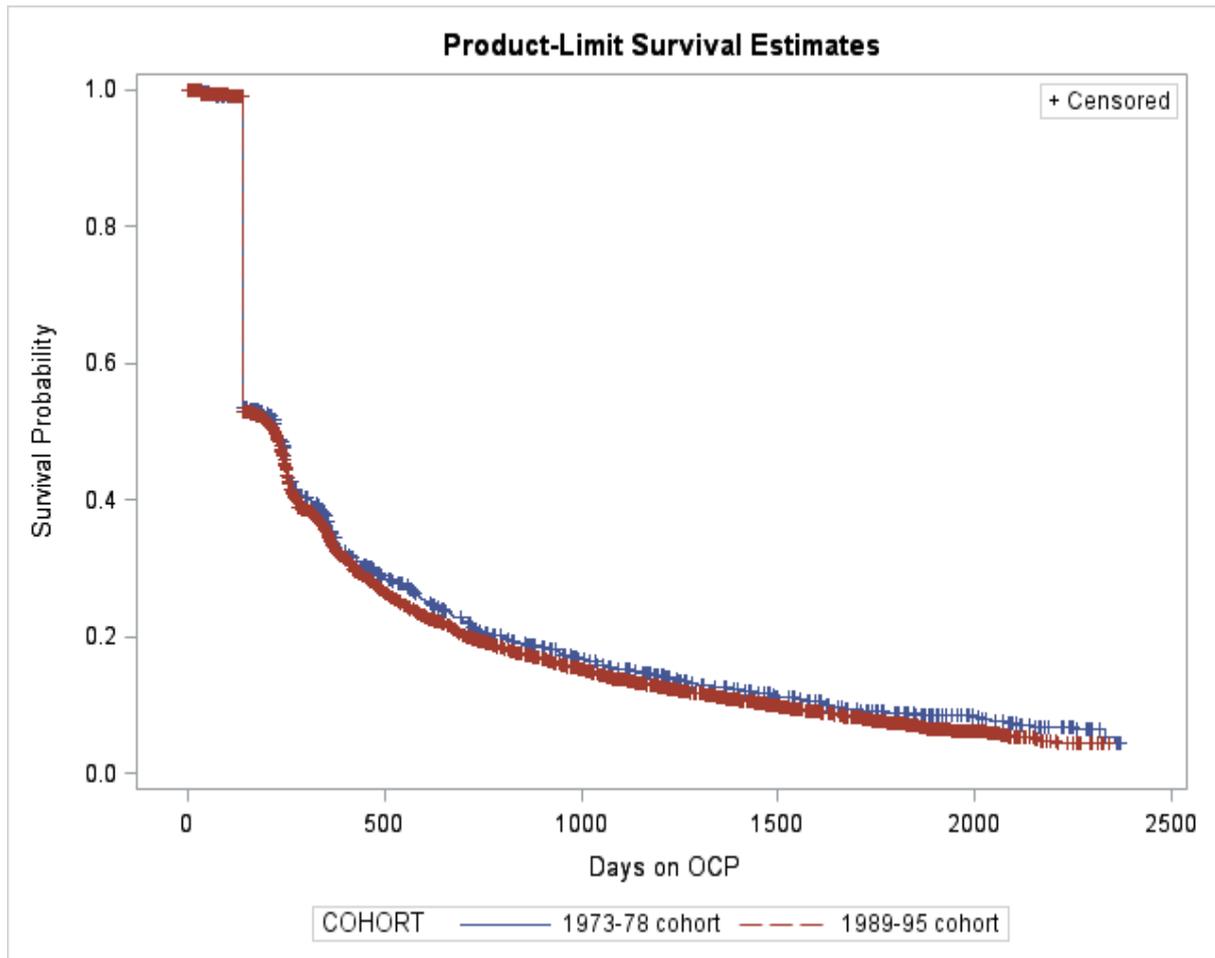


Figure 11-6. Kaplan Meier survival curve for time till end of OCP use for all periods of use beginning 1st January 2013 – 30th June 2019 for both 1989-95 and 1973-78 cohorts.

11.5.9 Demographic, health behaviour and health risk factors of short and long-term OCP users (all results)

Table 11-34 Demographic, health behaviour and health risk factors of short and long-term OCP users in the 1973-78 cohort

1973-78 Cohort	Long term user		Short term user		P
	N=1,045	%=61.6	N=651	%=38.4	
	Mean	StdDev	Mean	StdDev	
Age at start of period of use	39.0	2.2	39.5	2.4	<.0001
SF36 mental health score	72.1	16.8	71.7	16.8	0.5851
BMI	26.6	6.1	26.3	5.9	0.1023
Metabolic minutes activity in previous week	935.1	1228.4	986.2	1,424.1	0.7286
Number of children	1.5	1.2	1.5	1.2	0.606
	N	%	N	%	
Survey (survey which the information was taken)					<.0001
6 (2012)	675	64.6	365	56.1	
7 (2015)	331	31.7	221	34.0	
8 (2018)	39	3.7	65	10.0	
Area of residence (ARIA+)					0.0159
Major City	615	58.9	406	62.4	
Inner regional	272	26.0	128	19.7	
Outer regional/remote	148	14.2	102	15.7	
Self-rated general health					0.4791
Excellent/Good	942	90.1	591	90.8	
Fair/poor	101	9.7	56	8.6	
Pattern of alcohol consumption					0.3495
Low long-term risk, drinks at short-term risk less than weekly	826	79.0	513	79.0	
Non-drinker	96	9.2	50	7.7	
Low long-term risk, drinks at short-term risk weekly or more	47	4.5	40	6.1	
Risky/high risk drinker	57	5.5	33	5.1	
Smoking status					0.881
Never smoker	619	59.2	382	58.7	
Ex-smoker	318	30.4	193	29.7	
Current smoker	93	8.9	62	9.5	
Illicit drug use in the last 12 months					0.7555
No	969	92.7	601	92.3	

1973-78 Cohort	Long term user		Short term user		P
	N=1,045	%=61.6	N=651	%=38.4	
	Mean	StdDev	Mean	StdDev	
Yes	76	7.3	50	7.7	
Education level					0.2966
<i>School based qualification or below</i>	138	13.2	70	10.8	
<i>Certificate or Diploma</i>	319	30.5	198	30.4	
<i>University degree</i>	588	56.3	383	58.8	
Partnered					0.6434
No	240	23.0	141	21.7	
Yes	779	74.6	484	74.4	
Ability to manage on income					0.8355
<i>Impossible/difficult</i>	451	43.2	272	41.8	
<i>Easy/not too bad</i>	573	54.8	353	54.2	
Country of birth					0.2983
<i>Australia</i>	984	94.2	604	92.8	
<i>Other English-speaking country</i>	32	3.1	22	3.4	
<i>Non-English-speaking country</i>	24	2.3	23	3.5	
Ever been in a violent relationship?					0.9192
No	870	83.3	532	81.7	
Yes	151	14.5	91	14.0	
Previous miscarriage					0.4164
No	737	70.6	447	68.7	
Yes	308	29.5	204	31.3	
Previous termination					0.0707
No	853	81.63	508	78.0	
Yes	192	18.4	143	22.0	

Table 11-35 Demographic, health behaviour and health risk factors short and long-term OCP users in the 1989-95 cohort

1989-95 Cohort	Long term user		Short term user		P
	N=4,754	%=65.4	N=2,521	%=34.7	
	Mean	StdDev	Mean	StdDev	
Age at start of period of use	22.7	2.3	23.1	2.5	<.0001
Kessler psychological distress scale score	22.4	8.3	23.3	8.8	<.0001
BMI	24.3	5.5	25.3	6.5	<.0001
Metabolic minutes activity in previous week	1,553.5	1,833.9	1,573.6	1,854.4	0.8036
Number of children	0.1	0.3	0.1	0.5	<.0001
	N	%	N	%	
Survey					<.0001
1 (2013)	2,098	44.1	1,097	43.51	
2 (2014)	1,238	26.0	521	20.67	
3 (2015)	637	13.4	293	11.62	
4 (2016)	413	8.7	264	10.47	
5 (2017)	368	7.7	346	13.72	
Area of residence (ARIA+)					0.2417
Major City	3,481	73.2	1,802	71.48	
Inner regional	820	17.3	472	18.72	
Outer regional/remote	393	8.3	215	8.53	
Self-rated general health					<.0001
Excellent/Good	4,014	84.4	2,018	80.05	
Fair/poor	731	15.4	501	19.87	
Pattern of alcohol consumption					<.0001
Low long-term risk, drinks at short-term risk less than weekly	3,658	77.0	1,934	76.72	
Non-drinker	320	6.7	235	9.32	
Low long-term risk, drinks at short-term risk weekly or more	564	11.9	228	9.04	
Risky/high risk drinker	179	3.8	99	3.93	
Smoking status					0.0002
Never smoker	3,164	66.6	1,555	61.68	
Ex-smoker	609	12.8	347	13.76	
Current smoker	950	20.0	594	23.56	
Illicit drug use in the last 12 months					0.3059
No	3,157	66.4	1,644	65.21	
Yes	1,597	33.6	877	34.79	
Education level					<.0001

1989-95 Cohort	Long term user		Short term user		P
	N=4,754	%=65.4	N=2,521	%=34.7	
	Mean	StdDev	Mean	StdDev	
<i>School based qualification or below</i>	1,980	41.7	954	37.8	
<i>Certificate or Diploma</i>	1,342	28.2	845	33.5	
<i>University degree</i>	1,419	29.9	717	28.4	
Partnered					<.0001
<i>No</i>	3,475	73.1	1,691	67.1	
<i>Yes</i>	1,183	24.9	767	30.4	
Ability to manage on income					0.0446
<i>Impossible/difficult</i>	2,737	57.6	1,505	59.7	
<i>Easy/not too bad</i>	1,920	40.4	953	37.8	
Country of birth					0.9801
<i>Australia</i>	4,510	94.9	2,389	94.8	
<i>Other English-speaking country</i>	160	3.4	87	3.5	
<i>Non-English-speaking country</i>	84	1.8	45	1.8	
Ever been in a violent relationship?					<.0001
<i>No</i>	4,086	86.0	2,009	79.7	
<i>Yes</i>	561	11.8	451	17.9	
Previous miscarriage					<.0001
<i>No</i>	4,510	94.9	2,306	91.5	
<i>Yes</i>	244	5.1	215	8.5	
Previous termination					<.0001
<i>No</i>	4,480	94.2	2,281	90.5	
<i>Yes</i>	274	5.8	240	9.5	

11.5.10 References

American Pharmacist's Association (APhA) www.pharmacist.com/measuring-adherence/ Accessed November 2020.

Nelson N, Borrero S, Lehman E, Velott DL & Chuang H. (2017). Measuring oral contraceptive adherence using self-report versus pharmacy claims data. *Contraception*, 96(6): 453-459.

Triebwasser JE, Higgins S, Secura GM, Zhao Q & Peipert JF. (2015). Pharmacy claims data versus patient self-report to measure contraceptive method continuation. *Contraception*, 92(1): 26-30.

11.6 Appendix for Chapter 7

11.6.1 Calculation of treatment cycles in the MBS ART data

It took several cycles of data cleaning to identify a treatment cycle. The process was:

1. Remove duplicates/negative dollar amounts.
2. Identify cycles based on item numbers (primarily 13209 as defining a new cycles) and dates.
3. Identify and check cycles that had been coded as both IUI and IVF, recoding as necessary.
4. Inspect identified cycles that only had one item number and recode as necessary. For example, cycles that contained only 13209 without any other item numbers and a low dollar value were deleted as this was likely a specialist visit rather than a treatment cycle (and either way could not be classified as IUI or IVF). Cycles that contained only 13200 or 13201 and a higher dollar value were likely ART cycles.
5. Cycles longer than 30 days were then identified and recoded as necessary. For example, if the dates and item numbers indicated two separate cycles they were recoded. If the dates and item numbers indicated a long cycle the coding was unchanged.

There was substantial inconsistency in how cycles were billed, even within the same woman, which made coding and data cleaning quite complex. Some of the item number definitions also changed over time, which added an extra layer of complexity.

11.7 Appendix for Chapter 8: Sample selection for perinatal mental health screening analyses

11.7.1 1973-78 cohort

For the purpose of these analyses, the sample drawn from the 1973-78 cohort was restricted to the following criteria, using data up to and including Survey 8:

- Last reported birth (N = 8,627 babies; N = 8,627 women)

- Women were excluded when there were more than three years between the child's birth date and the participant's last returned survey (N = 6,940) OR when the child's DOB was after the date of last returned survey (N = 5)
- Women were excluded (N = 496) when the survey associated with the most recent birth was before Survey 5, as questions concerning perinatal screening were only included from Survey 5 onwards
- Women were excluded when they had missing data for the perinatal screening questions (N = 6)
- Final eligible sample, N = 1,180 women.

11.7.2 1989-95 cohort

For the purposes of these analyses, the sample drawn from the 1989-95 cohort was restricted to the following criteria, using data up to and including Survey 6:

- Last reported birth (N = 1,819 babies; N = 1,819 women)
- Women were excluded when there was more than three years between child's birth date and the participant's last returned survey (N = 526) OR when the child's DOB was after the date of last returned survey (N = 19)
- Women were excluded (N = 184) when the survey associated with most recent birth was before Survey 5, as questions concerning perinatal screening were only included from Survey 5 onwards
- Women were excluded when they had missing data for the perinatal screening questions (N = 7)
- Final eligible sample, N = 1,083 women.



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