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Original Article

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Time trends and characteristics associated with abortion method used by young Australian women

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Abstract

Objective: To explore time trends in abortion based on method used and characteristics associated with method type by uniquely linking social and behavioral data reported by a population-based cohort of young Australian women.

Methods: We analysed self-reported data from 16 993 women in the Australian Longitudinal Study on Women's Health 1989–95 cohort, aged 18–24 years at recruitment in 2013, linked to abortion data from three population-based administrative data sources.

Results: The incidence of medication abortion increased over time whereas surgical abortion decreased, with similar trends across the largest states. The adjusted odds ratio (AOR) of having a medication compared with a surgical abortion increased over time [by each 1-year increase in time, 1.33 (95% confidence interval 1.20, 1.48)]. Women who lived in outer regional/remote/very remote areas [AOR 3.51 (2.15, 5.74)] and inner regional areas [1.80 (1.21, 2.69)] had increased odds of a medication abortion compared with women who were living in major cities. Medication abortions were more common than surgical abortions in outer regional/remote/very remote areas from 2017 whereas, in major cities, surgical abortion remained the most common abortion method throughout the study period.

Conclusion: Linkage of government-recorded health events with self-reports demonstrated a shift towards increasing use of medication abortion relative to surgical abortion, with greater increases in nonmetropolitan areas. The strong geographical disparities in abortion method suggest that, for those who are living in nonmetropolitan areas, there may be less opportunity to choose surgical abortion due to limited availability of services, with significant implications for women who present later in pregnancy.

Keywords: induced abortion; young adults; data linkage; epidemiology; self-report; Australia.

Key Messages

- Abortion studies that are based on self-reported data are subject to underreporting due to stigma whereas, conversely, studies that are based on administrative data often lack detail on the characteristics of the women who are having abortions.
- This study describes abortion trends, including method used, among a nationally representative sample of young Australian women by directly linking individual-level self-reported abortion and socio-demographic data with health events in three administrative datasets to account for underreporting.
- Results demonstrate an increasing use of medication abortion relative to surgical abortion, and strong geographical disparities in the abortion method used which suggest that women who are living in nonmetropolitan areas may be restricted in their access to surgical abortion, with particular implications for women who present later in pregnancy.

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Introduction

It is estimated that, globally, 60% of unintended pregnancies and 30% of all pregnancies end in induced abortion [1]. In Australia, about one in four women (used here to designate all individuals who can become pregnant) will experience at least one abortion in their lifetime [2] and the abortion rate is estimated to be 17.3 per 1000 women aged 15–44 years [3]. Lack of routinely collected national data and agreed methods for abortion data collection introduce some degree of uncertainty into national estimates [4, 5], which have led to calls for improved monitoring of abortion care to enable evidence-based policy [4].

Abortion procedures are largely safe and noncomplex when delivered via recommended methods, either through the administration of medication or through a surgical procedure [1]. Abortion is decriminalized in all Australian states and territories [6] and, although legislation varies between jurisdictions (including gestational limits for the procedure), abortion is universally legally permissible until 16 weeks of gestation [4, 7]. Medication abortion through a combination of mifepristone and misoprostol is registered for use for up to 9 weeks (≤63 days) of gestation in Australia for "early medication abortion" [8, 9]. The combination regimen can also be used "off-label" in hospitals for later-gestation abortions [9, 10]. In other settings, the medication abortion regimen is approved for use at later gestations, e.g. in the USA and New Zealand up to 10 weeks [9, 11] and in Scotland up to 12 weeks [12], in line with the World Health Organization (WHO)'s abortion care guidelines [1]. Globally, medication abortion has overtaken surgical abortion as the most common abortion method [13] and the WHO suggests that medication abortion has "revolutionized" access to safe abortion care [1]. However, surgical abortion has an important place in abortion care, to meet the needs of those who present at a later gestational age when the early medication abortion option is no longer available. This includes people who are facing intersecting barriers to accessing abortion care [14, 15] and desired pregnancies with a fetal or medical indication for abortion.

Both methods have their advantages: for early medication abortion, these include that the process can be completed outside a medical facility, e.g. at home in privacy, and in a noninvasive manner (unless complications occur, although these represent <5% of cases). While the process of medication abortion is similar to a miscarriage, including approaches to the management of potential complications, surgical abortion offers the advantage of being quicker [16]. For many, it offers privacy and freedom from reproductive coercion [17] and may be considered less painful. However, in Australia, this method requires a day-surgery stay under sedation [18], which may be a barrier for some people, particularly those who need to travel long distances to access care [17]. Previous research has shown that most women prefer one abortion method over another [19] and that abortion experiences are generally better when women receive the method of their choice [20].

Abortion services in Australia are offered by both public and private providers, although public provision is limited [21]. Most abortions take place in the first trimester. Costs are lower in the first trimester but, overall, out-of-pocket costs still range from AUD $500 to $8500, increasing with gestational age [4, 6, 14]. Accessibility to abortion care is inconsistent throughout Australia and both geographical and financial barriers may restrict people's choice of method [14]. Surgical abortion care is limited outside metropolitan cities and there are areas in Australia that are regarded as "abortion deserts" where neither medication nor surgical abortion is available [4, 22].

Limited access to mifepristone for medication abortion has been available in Australia since 2006 through the Therapeutic Goods Administration Authorised Prescriber Scheme [23]. Wider availability only came about in 2013 once the combination regimen for early medication abortion was added to the Pharmaceutical Benefits Scheme (PBS), which is a list of medicines that are provided at a government-subsidized price [18]. Surgical abortion is still the dominant method in Australia, although a 5.1% annual decline in surgical abortion has been observed since the PBS listing of mifepristone–misoprostol [3]. In 2015, the introduction of telehealth services for medication abortion facilitated expanded access in Australia, with the greatest benefit to rural and remote communities [24].

Currently, there are limited data in Australia on abortion trends, including method type and if and how the method type varies by socio-demographic characteristics. Available data come from either self-reports, which are subject to underreporting due to the stigma associated with abortion, or, conversely, studies that are based on administrative information, which commonly lacks details on the characteristics of the women who are having abortions, limiting interpretation and usability. This study describes abortion trends among a nationally representative sample of young Australian women by linking self-reported abortion data with government-subsidized health service records, including the Medicare Benefits Schedule (MBS), the PBS, and the Admitted Patients Data Collection (APDC). Using self-reported abortion data from the Australian Longitudinal Study of Women's Health (ALSWH) 1989–95 cohort [25], linked at the level of the individual with the MBS, PBS, and APDC, we aimed to explore time trends in abortion methods used and characteristics associated with the method type in this sample of young women. Our research questions were:

i) What is the distribution of abortion by method (surgical versus medication abortion) and what are the trends in abortion method distribution over time?
ii) What are the socio-demographic characteristics associated with use of surgical versus medication abortions among participants of the 1989–95 cohort of the ALSWH?

Methods

Study design

In this population-based cohort study, we analysed self-reported data from the ALSWH and linked women's self-reports to abortion data from the MBS, PBS, and APDC. Further information about the ALSWH study can be found at alswh.org.au.

Sample

We analysed data from 16 993 women who were born between 1989 and 1995, who were aged 18–24 years when the cohort were first recruited in 2012/13, and who had consented to external data linkage (>99% consent). The 1989–95 ALSWH cohort are generally similar to women of the same age nationally; however, the ALSWH cohort has a higher proportion of women with tertiary qualifications [25].

Data sources

Linked data were sourced from administrative health datasets, including the MBS, PBS, and APDC for each Australian state and territory, to enable identification of medication and surgical abortion events across public and private hospitals and primary care settings [26]. The relevant prescriptions for medication abortions were not included in the data until 2013, when the mifepristone–misoprostol combination regimen was listed on the PBS [18]. Therefore, we only analysed data from 2013 onwards.

Identifying abortions

Medication abortions were identified in the PBS data by item codes 2710P (mifepristone) and 10211K ("MS-2 Step," mifepristone and misoprostol). Surgical abortions were identified in the MBS data by item codes 16525, 16530, 16531, and 35643, and in the APDC data by International Classification of Diseases (ICD) codes O04.0 to O04.9, O06.0 to O06.9, and Z32.2. The meaning and frequency of each code are presented in the Supplementary material.

Surgical abortions could be indicated via the MBS only, the APDC only, or both the MBS and the APDC. Steps were taken to ensure that a surgical abortion event that appeared in both the MBS and the APDC data was not counted twice. If a surgical abortion event appeared in the MBS within 6 weeks of a surgical abortion event in the APDC or vice versa, then only the first event was included.

Statistical analyses

We calculated the total number of surgical abortions and medication abortions for each year between 2013 and 2020 by using the linked administrative records of abortions as data points for the analysis. Next, we estimated the number of abortions per 1000 women and corresponding 95% confidence intervals (CIs). We present this information graphically both nationally, for the three largest Australian states, and for major cities, inner regional areas, and outer regional/remote/very remote areas. The denominator for these calculations decreased over time as participants within the sample died ($n = 23$).

We also sought to examine factors that were associated with young women who were having a medication abortion rather than a surgical abortion. Socio-demographic factors (age, highest qualification, area of residence, relationship status, country of birth, ability to manage on available income, and healthcare card) and the year of the abortion were used as predictors of a binary outcome (1 = medication abortion; 0 = surgical abortion) in a logistic regression model. We analysed women who had had at least one abortion since 2013 and only analysed the first abortion for each woman. Socio-demographic characteristics were obtained from the ALSWH survey preceding and most proximal to the date of the abortion, up to a maximum of 3 years. Further information about these variables is presented in the Supplementary material.

Results

Trends

Nationally, in our sample of women who were born in 1989–95, aged 18–24 years in 2012/13, the incidence of medication abortions increased over time whereas the incidence of surgical abortions decreased over time (Fig. 1). Similar trends were observed in New South Wales, Victoria, and Queensland (Fig. 2). The overall incidence rate of abortion

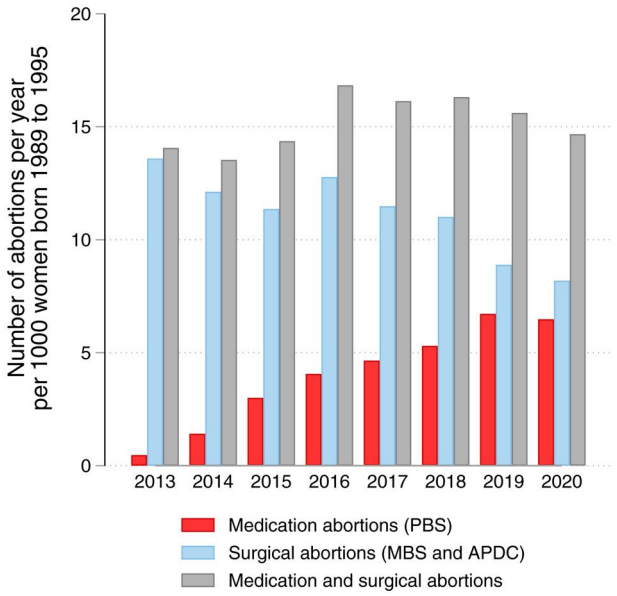

Figure 1. Number of abortions per year per 1000 women in Australia born in 1989–95, grouped by abortion type. PBS, Pharmaceutical Benefits Scheme; MBS, Medicare Benefits Schedule.

for the period 2016–20 (16 abortions per 1000 women) was higher than the incidence rate for the period 2013–15 (14 abortions per 1000 women), with evidence of an incidence rate difference of 1.9 abortions per 1000 women (95% CI 0.6, 3.3; *P*-value 0.005) (Fig. 1).

The incidence rate of surgical abortions varied over time as the women progressed from youth through to their early thirties. The surgical abortion rate decreased from 14 abortions per 1000 women aged 18–24 years in 2013 (95% CI 10, 14) (Table 1) to 8 abortions per 1000 women aged 25–31 years in 2020 (95% CI 7, 10). Conversely, the incidence rate of medication abortions per 1000 women increased from 1 abortion per 1000 women aged 19–25 years in 2014 (95% CI 1, 2)—the year after mifepristone was listed on the PBS—to 6 abortions per 1000 women aged 25–31 years in 2020 (95% CI 5, 8).

The incidence rate of medication abortions relative to the incidence rate of surgical abortions (i.e. the ratio of medication abortions to surgical abortions) was higher in inner regional and outer regional/remote/very remote areas compared with major cities (Fig. 3). In 2020, the incidence rates of medication and surgical abortions in major cities were 5 per 1000 women and 8 per 1000 women, respectively. Conversely, in outer regional, remote, and very remote areas, the incidence rate of medication abortions (9 per 1000 women) in 2020 was three times that of surgical abortions (3 per 1000 women). This pattern of medication abortions being more common than surgical abortions in outer regional, remote, and very remote areas was consistently observed from 2017 to 2020. Conversely, in major cities, the incidence rate of surgical abortions remained greater than the incidence rate of medication abortions from 2013 to 2020.

Factors associated with medication versus surgical abortion

Table 2 presents findings of the multivariate model of socio-demographic factors that were predictive of having a medication versus surgical abortion. Women who lived in outer regional/remote/very remote areas had increased odds

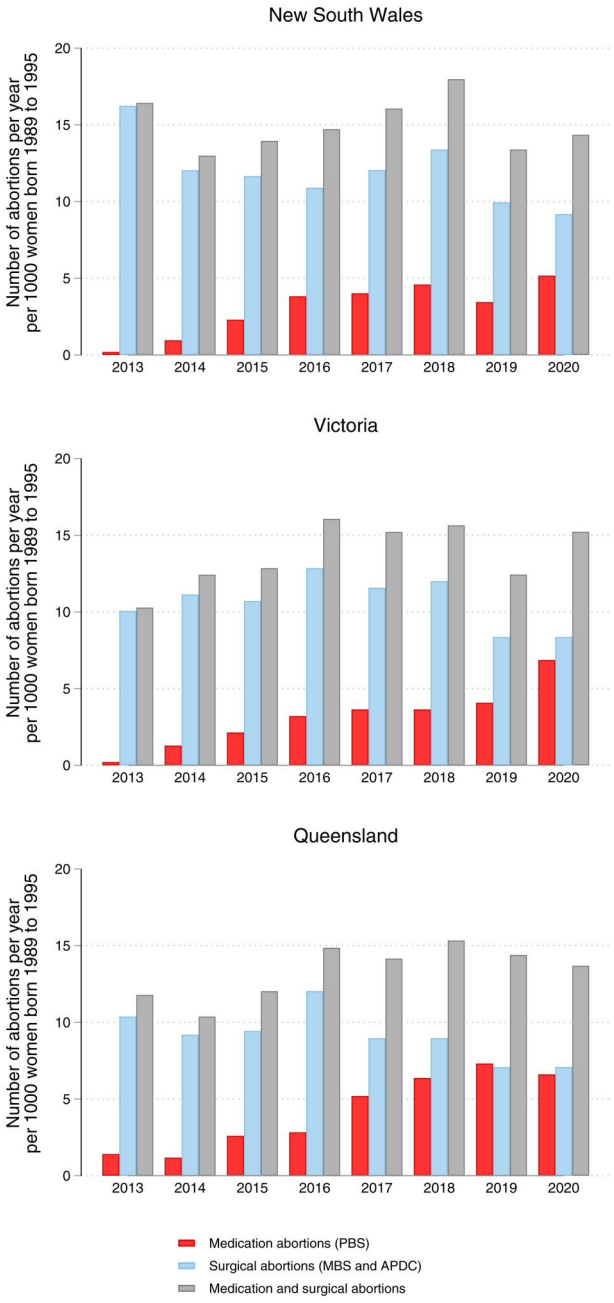

Figure 2. Number of abortions per 1000 women born in 1989–95, grouped by state in which the abortion occurred. PBS, Pharmaceutical Benefits Scheme; MBS, Medicare Benefits Schedule.

of a medication abortion [adjusted odds ratio (AOR) 3.51 (95% CI 2.15, 5.74)] compared with women who lived in major cities. Similar results were observed for women who lived in inner regional areas [AOR 1.80 (95% CI 1.21, 2.69)]. Women also had increased odds of having a medication abortion compared with a surgical abortion over time (from 2013 onwards). Each incremental 1-year increase in time was associated with increased odds of having a medication abortion compared with a surgical abortion [AOR = 1.33 (95% CI 1.20, 1.48)].

Discussion

In this study, we explored time trends in abortion methods used and characteristics associated with the abortion method type in a national sample of young Australian women. Our findings demonstrate that, since the mifepristone–misoprostol combination regimen for medication abortion was listed on the PBS in 2013 [18], this method has represented a steadily increasing share of the total number of abortions performed in this population. In 2020, medication abortion was nearly as common as surgical abortion at an aggregate level. However, disaggregated analyses revealed strong geographic disparities in the abortion method used. Women who lived in outer regional/remote/very remote areas had nearly four times the adjusted odds of having a medication abortion, and women in inner regional areas nearly double the odds, compared with women who lived in major cities. These findings are consistent with data that show higher medication abortion prescription rates in outer regional and remote areas of Australia compared with major cities [22]. In Victoria, perinatal data have also indicated improved access to abortion care since the introduction of medication abortion in 2013, although the proportion of women who reported prior abortions declined overall between 2010 and 2019 [27]. Collectively, these findings indicate that the medication option has enhanced geographical access to abortion care, yet the availability of and access to surgical abortion are still restricted for women who live outside of metropolitan areas. Given the current gestational age limit of 9 weeks to access early medication abortion in Australia, the reduced availability of surgical abortions can be a serious impediment for timely access to abortion care for pregnant women who are ineligible for the early medication option.

In our sample of young Australian women, surgical abortion remained the more common abortion type at an aggregate level throughout the study period. In Northern

Table 1. Estimates of the number of abortions per year per 1000 women, grouped by type.

Year	Age range (years)	Number of abortions		Number of women alive	Number of abortions per 1000 women (95% CI)	
		Medication	Surgical		Medication	Surgical
2013	18–24	8	231	16 993	0 (0, 1)	14 (12, 15)
2014	19–25	24	206	16 991	1 (1, 2)	12 (11, 14)
2015	20–26	51	193	16 986	3 (2, 4)	11 (10, 13)
2016	21–27	69	217	16 985	4 (3, 5)	13 (11, 15)
2017	22–28	79	195	16 980	5 (4, 6)	11 (10, 13)
2018	23–29	90	187	16 976	5 (4, 7)	11 (10, 13)
2019	24–30	114	151	16 973	7 (5, 8)	9 (8, 10)
2020	25–31	110	139	16 970	6 (5, 8)	8 (7, 10)

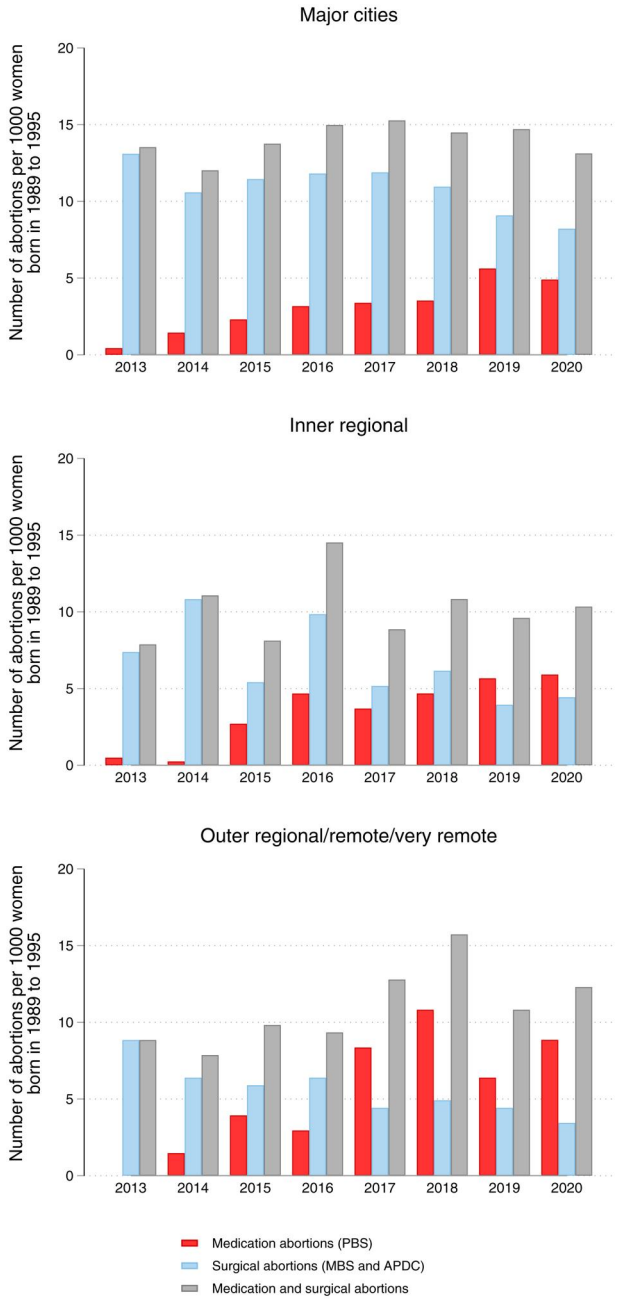

Figure 3. Number of abortions per year per 1000 women born in 1989–95, grouped by area of residence. PBS, Pharmaceutical Benefits Scheme; MBS, Medicare Benefits Schedule.

European countries, the share of medication abortion is much higher than in Australia, representing about two-thirds of all abortions (the highest are reported in Finland and Sweden, with 97% and 93%, respectively) [13]. Mifepristone was registered for use for medication abortion much earlier in many of these countries, e.g. in Sweden and Finland in 1992 and 1999, respectively [13], which partly explains the higher numbers of medication abortions in these countries. However, the shift towards medication abortion may also, to some extent, reflect health system constraints [28]. These may include lack of trained providers, higher costs of providing surgical abortion compared with medication abortion, infrastructure requirements, and funding models, which may lead service providers to limit method choice, restricting the ability of women to choose their abortion method [28]. It seems likely that such health system constraints contribute to the high share of medication abortions among women who live in regional and remote areas of Australia.

We have demonstrated in a previous study that was based on the 1989–95 ALSWH cohort that most pregnancies among young Australian women are unintended (lifetime prevalence 81.0% among ever-pregnant women). Women in regional and remote areas were more likely to carry an unintended pregnancy to term compared with women in metropolitan areas [29]. It seems important to further explore whether the observed differences in both the abortion method used and the outcomes of unintended pregnancy are related to barriers to the preferred abortion method or access barriers in general [13] or there are actual differences in pregnancy preferences between geographical areas, and the reasons underpinning them. Inequities in women's ability to choose the abortion method may particularly disadvantage those who are facing intersecting barriers to accessing care and who may be less able to advocate for themselves [30].

Although medication abortion is both safe and effective, it cannot replace surgical abortion in all instances, e.g. in cases in which the gestational age exceeds the limit for early medication abortion, medical contraindications exist, or the current dwelling is not a stable, supporting environment. Progress towards equal access to sexual and reproductive healthcare includes ensuring equal opportunities for women to choose the abortion method that is most suitable for them and their specific circumstances, and thus also equal access to surgical abortion when needed. A way to achieve this is to ensure that all public hospitals are equipped to provide surgical abortion or, at the very least, to support timely and affordable pathways to other local providers. This was a key recommendation that was made to the Australian Government following the 2023 Senate inquiry into universal access to sexual, maternity, and reproductive healthcare in Australia, which uncovered significant structural barriers to abortion care [4, 31]. Increasing the gestation at which medication abortion can be provided in Australia to match the WHO guidelines [1] would be another way to increase access for those who are unable to travel to obtain surgical abortion.

Strengths and limitations

The use of population-level cohort data linked with multiple government administrative data sources allowed us to track abortions from people in their young adulthood until their early thirties and provide a complete picture of abortions in this cohort, with high confidence and reliability of findings. A limitation of this analysis was the difficulty in disentangling the effect of age and time on the overall incidence rate of abortion. Although age did not show evidence of an effect in the regression model that was used to examine the predictors of medication abortions, we were unable to determine to what extent the changes in the incidence rate of medication and surgical abortions over time were due to age versus time. Attempts to separately model the effects of time and participant age on the incidence rate by using Poisson models were unsuccessful due to high levels of collinearity between both variables. Private hospital data for the Australian Capital Territory, Northern Territory, South Australia, and Tasmania were not available for data linkage. However, most women resided in New South Wales, Victoria, and

Table 2. Socio-demographic[a] predictors of medication abortions compared with surgical abortions.

Socio-demographic factor	Category	Adjusted odds ratio	95% confidence interval
Age (years)		0.99	0.90, 1.07
Time (years)		**1.33**	**1.20, 1.48**
Highest qualification	Year 12 or below	Ref.	
	Trade/certificate/apprenticeship/diploma	0.98	0.66, 1.45
	Tertiary qualification	0.95	0.61, 1.48
Managing on income	Not too bad/easy	Ref.	
	Difficult sometimes	0.99	0.68, 1.42
	Difficult always/impossible	0.89	0.58, 1.35
Area of residence	Major cities	Ref.	
	Inner regional	**1.80**	**1.21, 2.69**
	Outer regional/remote/very remote	**3.51**	**2.15, 5.74**
Relationship status	Partnered	Ref.	
	Non-partnered	0.89	0.64, 1.25
Healthcare card	No	Ref.	
	Yes	1.10	0.77, 1.58

[a] Country of birth was not associated with the outcome in preliminary analyses and was excluded from the model due to a high percentage of missing values (37%). Missing values for all other variables were between 0% and 5%.

Queensland, where both public and private hospital data were available and included in the analysis.

Conclusions and implications for public health

Our results indicate a shift towards increasing use of medication abortion relative to surgical abortion among young Australian women, reflecting international trends, and greater increases in medication abortion in nonmetropolitan areas. The strong geographical disparities in the abortion method used suggest that, for those who live in nonmetropolitan areas, there may be less opportunity to choose surgical abortion due to the limited availability of services. This has significant consequences for women who present later in pregnancy—a time of presentation that is associated with a concentration of underserved individuals who are facing the widest range of intersecting systemic, historic, and persistent barriers to accessing healthcare.

Ethics approval

The ALSWH has ongoing ethical approval from the Universities of Newcastle and Queensland's Human Research Ethics Committees (approval numbers H-2012-0256 and 2012000950 for the 1989–95 cohort). All participants consented to joining the study and are free to withdraw or suspend their participation at any time with no need to provide a reason. All participants expressly consented to health record linkage on recruitment in 2012/13. Those who subsequently opted out of record linkage were excluded from data-linkage requests.

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Author contributions

K.E., N.E., A.T., W.V.N., M.L.H., K.I.B., D.B., L.H., and M. S. designed the study. K.E. and M.S. directed the implementation of the study. K.E., M.S., M.L.H., and N.E. designed the analytical strategy. N.E. undertook statistical analyses and drafted the Methods and Results sections, including tables and figures. K.E., N.E., A.T., W.V.N., M.L.H., K.I.B., D.B., L.H., and M.S. helped to interpret the findings. K.E. conducted the literature review and drafted the Abstract, Key Messages, Introduction, and Discussion sections. N.E., A.T., W.V.N., M.L.H., K.I.B., D.B., L.H., and M.S. provided critical feedback on the manuscript.

Supplementary data

Supplementary data are available at *IJE* online.

Conflict of interest: None declared.

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Data availability

ALSWH survey data are owned by the Australian Government Department of Health and Aged Care and, due to the personal nature of the data collected, release by the ALSWH is subject to strict contractual and ethical restrictions. Ethical review of the ALSWH is conducted by the Human Research Ethics Committees at the University of Queensland and the University of Newcastle. De-identified data are available to collaborating researchers when a formal request to make use of the material has been approved by the ALSWH Data Access Committee. The committee is receptive of requests for datasets that are required to replicate results. Information on applying for ALSWH data is available from https://alswh.org.au/for-data-users/applying-for-data/. In addition, linked administrative data have been provided by third parties (see details here). In order for these linked data to be accessed through the ALSWH, every data user must be added to the applicable Data Use Agreements and Human Research Ethics Committee protocols. Details of the HREC protocols that cover the use of linked data are listed here.

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