Declining rates of sterilization procedures in Western Australian women from 1990 to 2008: the relationship with age, hospital type, and government policy changes

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Objective: To describe trends in age-specific incidence rates of female sterilization (FS) procedures in Western Australia and to evaluate the effects of the introduction of government-subsidized contraceptive methods and the implementation of the Australian government's baby bonus policy on FS rates.
Design: Population-based retrospective descriptive study.
Setting: Not applicable.
Patient(s): All women ages 15–49 undergoing an FS procedure during the period January 1, 1990, to December 31, 2008 (n = 47,360 procedures).
Intervention(s): Records from statutory statewide data collections of hospitals separations and births were extracted and linked.
Main Outcome Measure(s): Trends in FS procedures and the influence on these trends of the introduction of government policies: subsidization of long-acting reversible contraceptives (Implanon and Mirena) and the Australian baby bonus initiative.
Result(s): The annual incidence rate of FS procedures declined from 756.9 per 100,000 women in 1990 to 155.2 per 100,000 women in 2008. Compared with the period 1990–1994, women ages 30–39 years were 47% less likely (rate ratio [RR] = 0.53; 95% confidence interval [CI], 0.39–0.72) to undergo sterilization during the period 2005–2008. Adjusting for overall trend, there were significant decreases in FS rates after government subsidization of Implanon (RR = 0.89; 95% CI, 0.82–0.97) and Mirena (RR = 0.81; 95% CI, 0.73–0.91) and the introduction of the baby bonus (RR = 0.70; 95% CI, 0.61–0.81).
Conclusion(s): Rates of female sterilization procedures in Western Australia have declined substantially across all age groups in the last two decades. Women's decisions to undergo sterilization procedures may be influenced by government interventions that increase access to long-term reversible contraceptives or encourage childbirth. (Fertil Steril® 2016;106: 704–9. ©2016 by American Society for Reproductive Medicine.)
Key Words: Female sterilization, long-acting reversible contraceptives, baby bonus, linked population health data

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Sterilization is a common method of birth control worldwide for both men and women (1). Female sterilization (FS) remains a common birth control method, although rates have declined in the last two decades (2–4). Male sterilization (vasectomy) procedures are more effective, safer, and less expensive than FS. Vasectomies are performed with increasing frequency and likely contribute to diminishing FS rates (1).

The rate of decline in FS procedures has varied substantially across countries. In the United Kingdom (UK), annual FS incidence rates declined by 30%, from 0.50% in 1992 to 0.35% in 1999 (2), and in Scotland were documented to have decreased by more than 60% from 2000 to 2007 (5, 6). The rate of decline in the United States has been more modest: total annual cases of FS declined from 687,000 in 1995 to 643,000 in 2006, after two decades of stable rates (3).

The diminution has also been attributed to the availability of an increasing range of effective reversible birth control measures that give women alternative options to control reproductive ability, particularly long-acting reversible contraceptives (LARCs) (3, 5, 6). The use of LARCs has been actively encouraged by health professionals, and women themselves have recognized the wisdom of keeping their fertility options open by using LARCs or other (nonmedical) methods (6, 7). Access to LARCs such as intrauterine contraceptives varies between countries (8, 9).

Health policies such as changes in government subsidization of services may also impact FS rates. For example, the Norwegian copayment system in 2002 increased patient contribution to the sterilization procedure from €33 to €750, resulting in a strong decline in FS rates (10).

Currently there is limited information about trends and impact of government policy changes on FS rates in Australia, with no peer-reviewed research published since 1995 (11). Health care in Australia is characterized by a dual funding system: many individuals have private insurance policies that complement universally accessible government subsidization of pharmaceuticals (the Pharmaceutical Benefits Scheme [PBS]) as well as many outpatient and inpatient services (12). Higher income is a very strong determinant of possessing private health insurance and of being admitted to a private hospital (13). In Australia, use of the etonogestrel-releasing subdermal implant (Implanon) became widespread from 2001 when it became PBS subsidized (14, 15). Similarly, the levonorgestrel releasing-intrauterine system (Mirena) was listed on the PBS for contraceptive purposes from 2003 (16). Further, the Commonwealth Government introduced a baby bonus scheme as of July 1, 2004, under which mothers received $3,000 per new child. This amount was increased to $4,000 on July 1, 2006, and to $5,000 on July 1, 2008 (17, 18).

We used whole-population linked administrative health data from the state of Western Australia (WA) to explore sterilization trends among women of reproductive age (15–49 years) from January 1, 1990, to December 31, 2008, by age group and hospital type. We also evaluated the influence on FS rates of certain government policies implemented in this period: subsidized access to LARCs and the introduction of the baby bonus.

MATERIALS AND METHODS

Study Population

The study sample included all women resident in WA with a record in the WA Hospital Morbidity Data Collection (HMDC) of having undergone a sterilization procedure from January 1, 1990, to December 31, 2008, and who were considered to be of childbearing age, defined as 15–49 years (19, 20), at the time of the procedure. At the 2001 census closest to the midpoint of the study, WA had a population of about 471,853 women ages 15–49 years, of whom 68.6% were born in Australia or New Zealand (NZ) and 3.2% identified as Aboriginal and/or Torres Strait Islander (hereafter called indigenous) (21).

FS interventions were identified from principal and secondary procedure codes on each record in the HMDC, based on the contemporaneous version of the International Classification of Disease (ICD): ICD-9 (56.62–56.65, 59.80, 66.2–66.29, 66.3–66.39, 66.6, 66.63–66.64), or ICD-10 (35638-08, 35638-10, 35688-00, 35688-01, 35688-02, 35688-03, 35688-04, 35717-02, 35717-03) (22–24).

Data Sources

HMDC and Midwives Notification System (MNS). Study data were extracted from two statutory statewide data collections: the HMDC, which includes routinely collected data on all discharges from all public and private hospitals in WA (where all FS procedures are performed in hospitals), and the MNS, which collects demographic and clinical information on all births within WA. Data from these collections were linked through the WA Data Linkage System using validated probabilistic matching techniques described elsewhere (25). All episodes of FS and each woman's date of birth, country of birth, indigenous status, and the hospital type where the procedure occurred were obtained from the HMDC. Data on previous pregnancies and the related date of birth of each resulting child were obtained from the MNS collection, to determine parity before the first hospital admission for an FS procedure. The total WA age-specific female populations for each calendar year were obtained from the Department of Health of WA, Epidemiology Branch (26).

Index admission and hospital type. Index FS was defined as the patient's first FS procedure at a WA hospital during the study period. For the purposes of this study, hospital types were categorized as public metropolitan, private metropolitan, or rural hospitals. The category "rural hospital" did not differentiate between public and private hospital.

Statistical Analyses

Annual overall and age-specific (20–29, 30–39 and 40–49 age groups were only included in these analyses) incidence rates for sterilization among WA women ages 15–49 years during the study period were calculated. The rate numerator consisted of the numbers of cases of incident FS for the specific calendar year, and the denominator was the population at risk, defined as the population of women (in the relevant age range) in that calendar year who had not previously