

The Evolving Role of Permanent Contraception in the United States, 1965-2019

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Short abstract:

The use of effective contraception allows people to manage reproduction and thus can drive demographic trends, particularly declines in birth rates. At the same time, demand for contraception can also be a product of the demographic regime. In particular, changes in fertility desires and timing may shift the demand for permanent vs. reversible forms of contraception. In this paper, we examine trends in permanent contraception (sterilization) in the United States and the relationship between these trends and trends in fertility. We consider levels of permanent contraception as well as distribution by age and parity. Consistent with previous research on the uptake of permanent contraception in the U.S., our preliminary results suggest that increasing sterilization rates contributed to the post-Baby Boom decline in birth rates. In contrast, recent declines in birth rates are not driven by permanent contraception; instead, sterilization rates are falling even as birth rates decline. Comparing age-standardized sterilization rates with unstandardized rates suggests that some of the recent decline in sterilization is attributable to changes in the age structure of fertility. The completed paper will refine preliminary analyses and add subgroup-specific analyses of permanent contraceptive use by age, parity, and duration since last birth.

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Rates of permanent contraception (sterilization) are high in the United States relative to other low-fertility countries, especially for women (Eeckhaut and Sweeney 2016). These high levels date to the 1960s, shortly after permanent contraception became readily available and safe, and sterilization continues to be the most common contraceptive method among women of reproductive age despite recent increases in the use of long-acting reversible methods such as IUDs and implants (Bumpass and Presser 1972; Daniels and Abma 2020). The high prevalence of permanent contraception reflects institutional characteristics of the health care and health insurance systems as well as longstanding patterns of gendered inequality by race and socioeconomic status (Eeckhaut and Sweeney 2016; Kluchin 2011). To some extent, contraceptive preferences are shaped by social influence and informal networks (Borrero et al. 2009), and thus high levels of permanent contraception may be self-perpetuating.

The use of effective contraception allows people to manage reproduction and thus can drive demographic trends, particularly declines in birth rates. At the same time, demand for contraception can also be a product of the demographic regime. In particular, changes in fertility desires and timing may shift the demand for permanent vs. reversible forms of contraception. Over the course of the 20th century and into the 21st century in the US there have been two periods of sustained decline in fertility. Birth rates fell substantially at the end of the Baby Boom, from the late 1960s into the early 1970s, then were largely stable until the most recent decline that began with the Great Recession (Morgan 1996; Osterman et al. 2024). During the forty years between these two declines, although fertility quantum was largely stable, there were substantial changes in the timing and relationship context of childbearing, and these changes were unequally distributed across population subgroups (Guzzo and Hayford 2020).

In this paper, we describe changes in levels and life course context (age and parity) of female sterilization over the 20th and 21st century in the U.S.. Our goal is to understand how decisions about permanent contraception may have both contributed to and been shaped by changes in fertility quantum and timing. We build on earlier literature describing the introduction and growing acceptance of permanent contraception (Bumpass 1987; Bumpass and Presser 1972; Bumpass, Thomson, and Godecker 2000; Hayford, Kissling, and Guzzo 2020; Presser and Bumpass 1972) to understand the evolving demographic context of sterilization in the U.S.. In this extended abstract, we describe our data and approach and present initial aggregate descriptive results. The completed paper will refine these results and add results for specific population subgroups (race-ethnicity, education).

Data and methods

We draw on data from nationally representative cross-sectional surveys of women of reproductive age in the U.S. between 1960 and 2019. (We anticipate adding additional data covering the period 2022-2023 for the completed paper.) These data come from the Growth of American Families Survey (GAF; 1960), the National Fertility Surveys (NFS; 1965, 1970) and the National Surveys of Family Growth (NSFG; 1973, 1976, 1982, 1988, 1995, 2002; continuous data collection 2005-2019). All of these surveys were designed to provide nationally-representative data on fertility desires, intentions, and outcomes as well as contraceptive attitudes and behaviors. The sample frames for the surveys differ. The GAF and NFS were limited to currently married (1960, 1965) or ever-married (1970) women. In 1973 and 1976, the NSFG included ever-married women and never-married women with children in the household, and starting in 1982 all women of reproductive age (15-44) were included in the sample frame. In 2015 the age range was extended to age 49. Because our focus is on permanent contraception,

which was extremely rare among unmarried women in the early period of its introduction, the sample restrictions in the early surveys are not prohibitive for our descriptive analyses of the demographic characteristics of sterilized women. However, we are not able to provide population prevalence for the early period. We note in the results section where variation in sample frames is most likely to affect our results; in the completed paper, we will assess the sensitivity of results to excluding the early surveys.

For the GAF, NFS, and early NSFG, we use harmonized data from the Integrated Fertility Survey Series (IFSS; Smock, Granda, and Hoelter 2015). Data from the continuous NSFG (2005-2019) are downloaded from the National Center for Health Statistics. Questions about fertility and contraceptive use are highly comparable across surveys.

All of the component surveys use complex sample designs. Weights and strata variables are available from the IFSS for the early surveys and the NSFG through 2002. For the continuous NSFG, we use the weights designed for the two-year data releases, which weight the sample to match the population at the mid-point of the two-year period.

Key measures. Our primary variable of interest is whether the respondent has ever undergone contraceptive sterilization and, if so, the life course context of sterilization (age, parity, and timing relative to most recent birth). This measure is taken from direct questions about sterilizing operations. Essure, a non-surgical method of permanent contraception, is included in this measure for surveys covering the time period when it was available.

All surveys include respondent's date of birth and a full fertility history. We use these measures to construct life course context at permanent contraception. Dates for pregnancy and birth histories, sterilizing operations, and respondent's birthday are measured to the month and year. In the most recent data releases (2015 and later), exact dates are not available in the public release data, and only the year of the event is reported. We approximate month by assuming all events took place in June of the reported year.

Analytic approach. We pool data from all surveys and present time trends by birth cohort or by age and time period. In most cases, the age-period-cohort combinations covered by the retrospective data from the surveys overlap, i.e., estimates for a given cohort/period draw on data from multiple surveys. These preliminary results present unweighted estimates; the completed paper will use survey weights as described above.

We first present time trends for birth-order-specific TFR over the course of the 20th and early 21st century calculated using data from the Human Fertility Database. These figures illustrate the macro-level demographic context of decision-making about permanent contraception.

We then show descriptive figures of permanent contraception experiences and context among women age 40 and over at the time of the survey. These tables represent cumulative experience across the reproductive life course from observed cohorts, including number of births (parity).

Finally, we show period estimates of sterilization calculated among women of different ages and parity. We first show the proportion of women sterilized as a function of their parity at the beginning of the period. We then calculate age- and parity- specific fertility rates and average them across age groups to obtain a time series of age-standardized sterilization rates.

Preliminary results

Figure 1 shows birth-order-specific period total fertility rates for the period 1933 to 2021. The main fertility trends of the 20th and early 21st centuries are clearly visible from this figure: The

Baby Boom, when birth rates rose at all parities; the following Baby Bust, in which birth rates fell, starting with first births and with higher parities following; the long period of stability; and finally the recent declines in birth rates spurred by the Great Recession. In this most recent period of decline, first and second births have fallen more sharply than rates at higher parities.

Cohort patterns of permanent contraception. Figure 2 presents cumulative sterilization proportions by age among women who have reached the end of their childbearing years (age 40 or over at the time of survey), by birth cohort. Permanent contraception was relatively rare for the cohorts born early in the 20th century, only reaching 10% at the end of the reproductive period among those born in the early 1930s. For the cohorts born in the late 1930s, the cumulative proportion sterilized nearly doubled, to 20%. (Note that population prevalence of sterilization is overestimated in these cohorts, because the early surveys did not include unmarried women.) Permanent contraception increased in prevalence through the cohorts born in mid-century, reaching a peak of more than one in three women for the cohorts born in the early 1950s. After this peak, the cumulative share sterilized declined.

It is apparent from Figure 2 that permanent contraception is common at relatively young ages in the U.S., particularly in the recent birth cohorts, with substantial shares sterilized by age 30. Age patterns of permanent contraception are shown more directly in Figure 3, also based on cohorts observed at the end of the reproductive years. Across all birth cohorts, mean age at permanent contraception (among those who experienced it) was relatively young, between age 30 and 35. Mean age peaked among the cohorts born 1935-39, who were having children during the Baby Boom, and then declined afterwards.

These declines in age at sterilization may be partly due to women choosing permanent contraception at lower parities. Figure 4 shows the distribution by parity of women choosing permanent contraception, again by birth cohort. For women born in the early part of the century, sterilization took place primarily at parities four and higher. For the 1940s and 1950s cohorts, sterilization at relatively low parities was common; about 40% of those sterilized had two children. This shift likely reflects both changes in desired family size and changes in social acceptance of sterilization.

Period rates of permanent contraception. To complement these cohort portraits of permanent contraception experiences, we also estimate period rates. Figure 5 shows sterilization rates for women age 15-44 by parity. The figure shows time trends starting in the late 1960s, when sterilization was becoming easily accessible in the U.S., through the most recent available data in 2015-19. As might be expected, permanent contraception is very rare for childless women at all times. The shape of the time trends is quite similar for all other parities. Rates are lowest at parity one and similar for parities two, three, and four and higher. At all parities, rates of permanent contraception peak in the early 1980s and then decline. It is interesting to note that time trends in permanent contraception do not align perfectly with time trends in birth rates (Figure 1). While birth rates stabilized in the early 1970s, permanent contraception rates continued to increase for another 10 years. And although sterilization rates declined starting in the mid-1980s, birth rates did not increase. Since 2009, the U.S. has seen falling birth rates at all parities combined with falling rates of permanent contraception at all parities.

One reason for this disjuncture may be changing age schedules of fertility in the U.S.. Mean age at first birth has been increasing steadily since the 1960s while desired family size has stayed largely constant (Guzzo and Hayford 2020; Hagewen and Morgan 2005; Morgan 1996), so that

people are older when they reach their desired family size and need contraception for fewer years. Some of the recent decline in permanent contraception may therefore be due to changes in the age at which people have children. To assess this possibility, we calculate age-standardized rates of sterilization, shown in Figure 6. The increase in sterilization rates early in the period of study looks similar in this figure to the unstandardized rates in Figure 5. However, the decline is much less steep in the age-standardized figure, suggesting that some of the observed decline in parity-specific sterilization rates is attributable to increasing age at each parity.

Discussion and next steps

Permanent contraception became widely available in the 1960s in the U.S. and was rapidly adopted as the most common form of contraception. The uptake of permanent contraception coincided with declines in birth rates and the emergence of the two-child norm toward the end of the Baby Boom, and permanent contraception use likely contributed to the Baby Bust. In contrast, trends in sterilization do not appear to be contributing to recent declines in fertility in the U.S.. Since 2008, birth rates and sterilization rates have both been falling.

The post-Baby Boom decline in birth rates was driven by “stopping” behavior. Birth rates fell because desired family sizes were getting smaller and because women were having fewer “excess” births at the end of their reproductive careers. Permanent contraception made it easier to stop childbearing and to prevent unintended births over a long period of time – a necessary contribution to fertility decline in a context where childbearing both began and ended at relatively young ages.

Contemporary fertility declines, in contrast, are driven by postponement, and in particular by delays in first births. It is not yet clear to what extent postponed births will be recuperated, but recent evidence suggests that many women continue to want children well into their late thirties and early forties (Guzzo and Hayford 2023). Some evidence also suggests that uncertainty about fertility intentions is increasing (Badolato and Hayford 2023). In this context, permanent contraception may become a less attractive option. Still, sterilization rates remain high, even at relatively young ages, which may reflect differences both in method preferences and in fertility timing between population subgroups.

Historically, high rates of permanent contraception in the U.S. were in part a consequence of the distinctive fertility regime featuring high rates of early, largely unintended, childbearing. This fertility regime was most common among less advantaged population subgroups, such as minoritized racial and ethnic groups and those with low levels of education (Guzzo and Hayford 2020). As unintended birth rates have fallen in the U.S. (Kost, Zolna, and Murro 2023), it is unclear to what extent this distinctive and bifurcated fertility regime will persist.

In the completed paper, we will refine the analyses presented in this extended abstract by including weights and assessing sensitivity to differences in sample frames across surveys. We will also add analyses of subgroup-specific rates (race-ethnicity, education) and expand our focus on life course context by considering changes in the duration between last birth and permanent contraception, with a particular focus on short durations (sterilization at delivery or shortly after delivery) as an indicator of long-term plans to stop. We will discuss these findings in the context of existing research on permanent contraception in the U.S., the expansion of access to long-acting reversible methods of contraception, and recent declines in fertility.

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Figure 1.

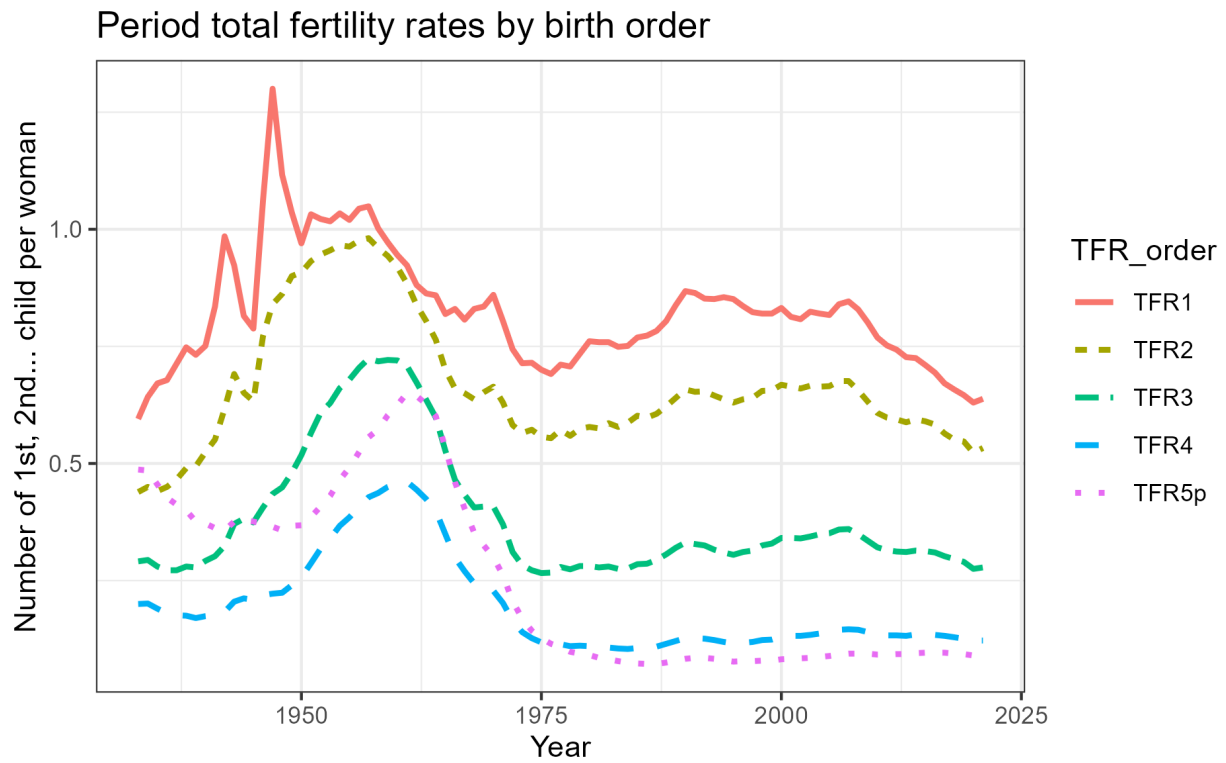


Figure 2.

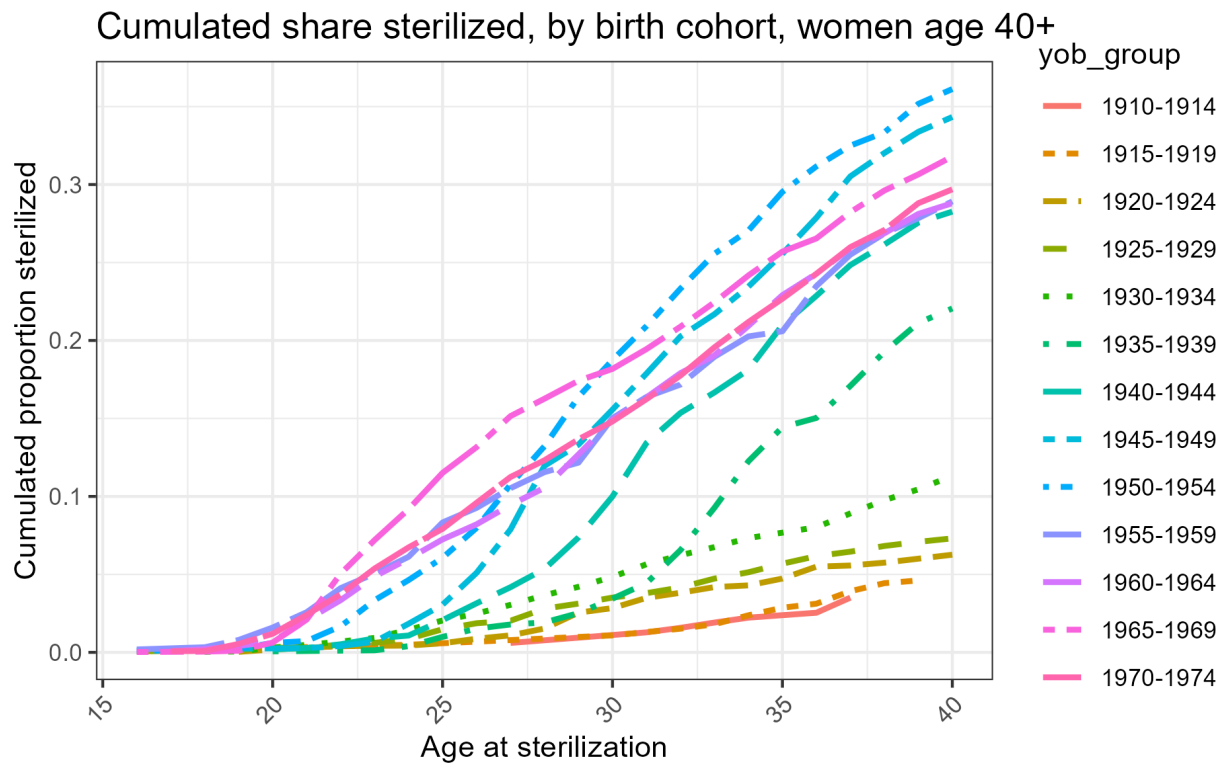


Figure 3.

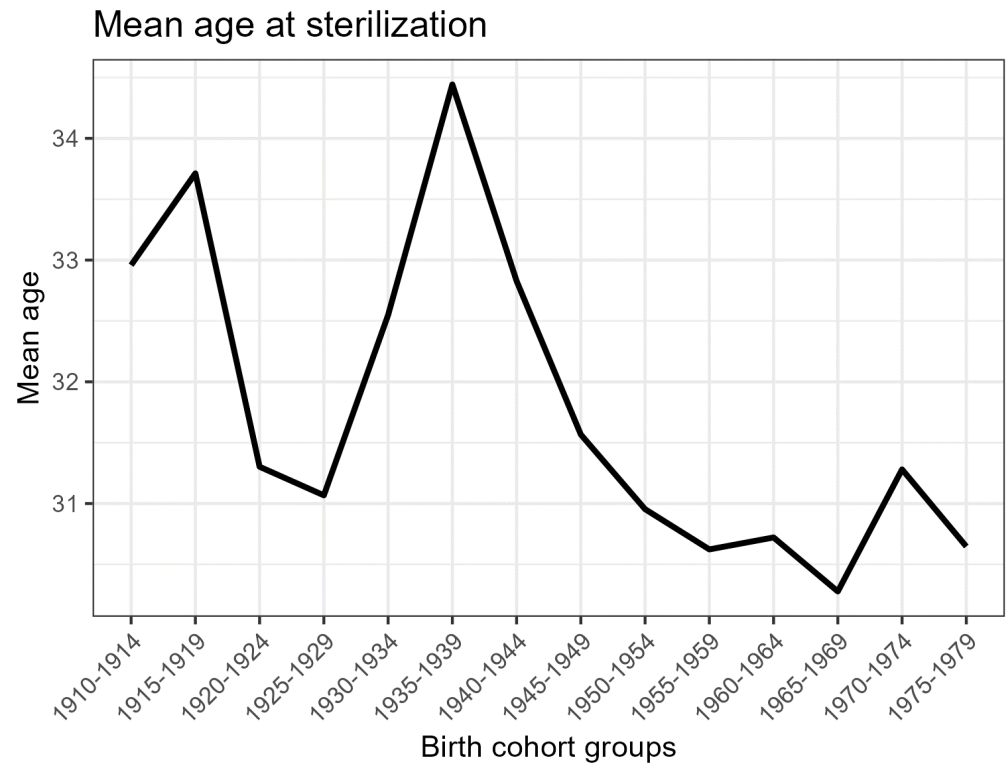


Figure 4.

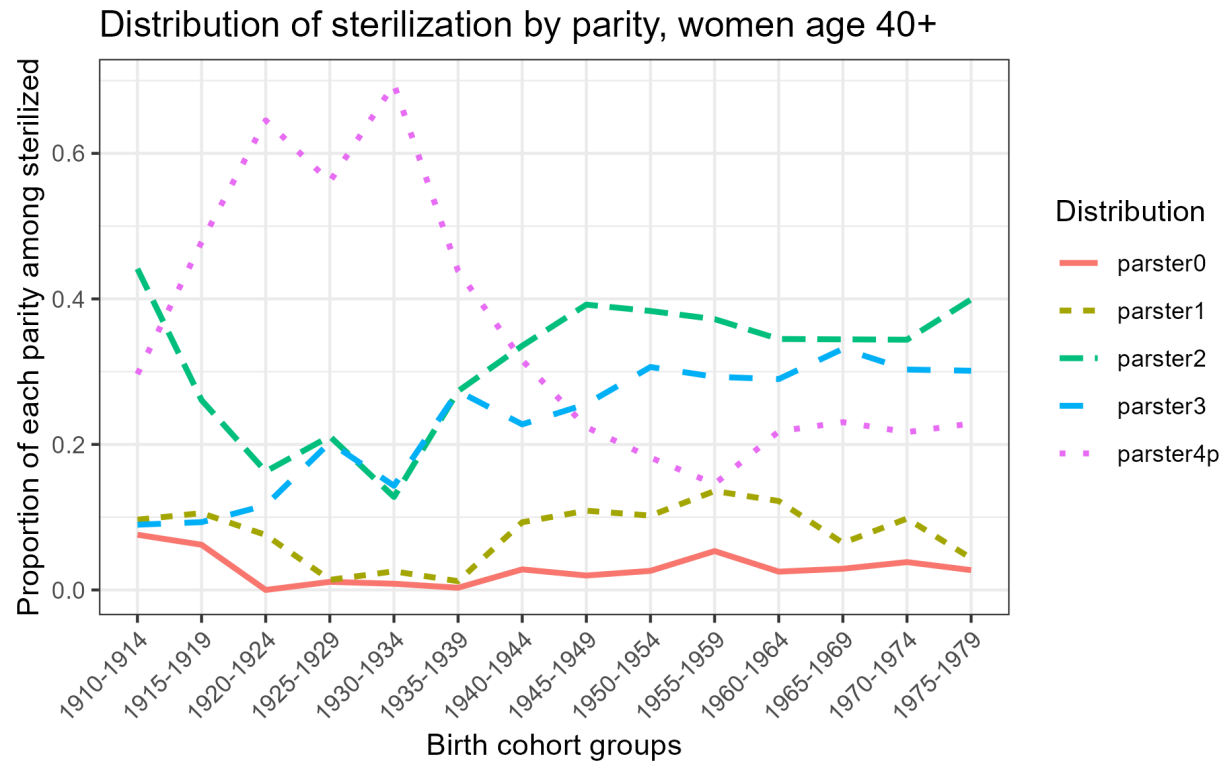


Figure 5.

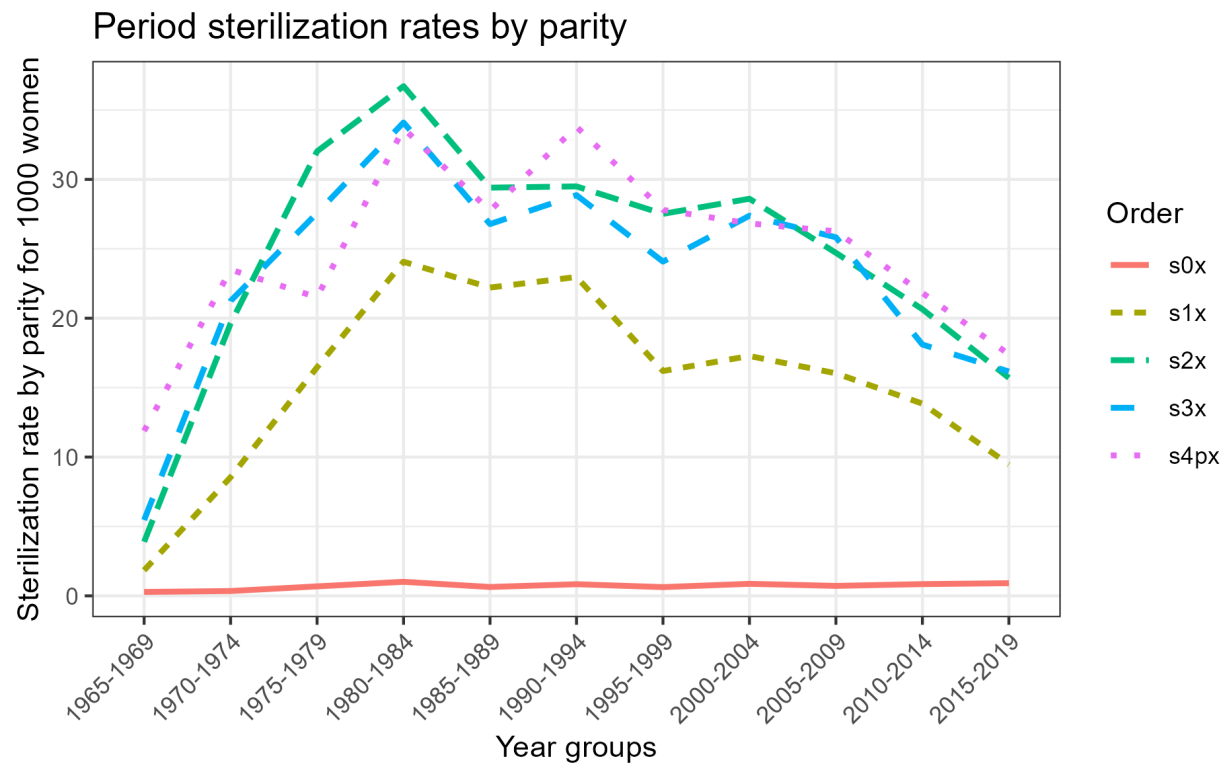


Figure 6.

