

Original research article

# Contraceptive sterilization among married adults: national data on who chooses vasectomy and tubal sterilization<sup>☆,☆☆</sup>

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Received 26 September 2011; revised 14 October 2011; accepted 17 October 2011

## Abstract

**Background:** Vasectomy has been found to be a highly cost-effective contraceptive method. For couples, tubal sterilization and vasectomy have the same result, but the two methods are used by different segments of the population.

**Study design:** We conducted an analysis of data from male and female samples of the 2006–2008 National Survey of Family Growth, nationally representative samples of men and women in the United States aged 15–44 years.

**Results:** Among married men, 13.1% reported vasectomies (95% confidence interval 10.4%–16.3%), compared to 21.1% (17.8%–24.9%) of married women who reported tubal sterilizations. Men with higher education and income had greater prevalence of vasectomy than those less educated, while women with lower education and income had the highest prevalence of tubal sterilization.

**Conclusions:** Efforts to promote vasectomy use need to understand the reasons behind these differences. Increasing the availability and use of vasectomy will require education about its benefits.

Published by Elsevier Inc.

**Keywords:** Vasectomy; Tubal sterilization; Tubal ligation; Surgical sterilization

## 1. Introduction

The prevalence of male and female contraceptive sterilizations, which are among the most popular and effective contraceptive methods, has been stable in the United States since the 1990s [1,2]. For a couple that desires no more children, vasectomy and tubal sterilization have the same effect: permanent, highly effective contraception. Although complications are rare for both techniques, they tend to be more serious for tubal sterilization because of the more invasive nature of the procedure [3]. Vasectomy has been found to be one of the most highly cost-effective

methods in an analysis that considered the costs of the procedure, of failures and of side effects [4].

Of the two approaches to sterilization, tubal sterilization has been found to be more prevalent [1]. As permanent methods, both vasectomy and tubal sterilization are more common among older men and women, and those with more children. For other characteristics, the patterns of prevalence of vasectomy and tubal sterilization have been found to be quite different. Tubal sterilization is more prevalent among those with lower income and education levels, and among minority groups, while vasectomy tends to have the opposite pattern: its use is higher among those with higher education and income and among white men [5–10]. Given the advantages of vasectomy, it would be useful to understand why it is not more prevalent and why it appeals to a different demographic segment of the population.

We analyzed the most recently released data from the National Survey of Family Growth (NSFG) to examine the prevalence of married men and women who use vasectomy

<sup>☆</sup> Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

<sup>☆☆</sup> No funding was provided for this study.

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and tubal sterilization for contraception. Among married men and women, we looked at data collected on the NSFG to attempt to explain the reverse pattern of prevalence of tubal sterilization and vasectomy observed by socioeconomic measures, and discuss the implications for the delivery of contraceptive services in the United States. We have limited the analysis to currently married men and women because our main focus is on who chooses tubal ligation versus vasectomy; for each subject in the analysis to have a partner who can select the other method makes for a more direct comparison of the two methods.

## 2. Materials and methods

Data were analyzed from the male and female samples of the 2006–2008 release of the NSFG. In-person interviews were conducted during 2006–2008 with two independent nationally representative samples of 7356 women and 6139 men aged 15–44 years; the overall response rate for the survey was approximately 75% [1]. Weighting factors were used to produce nationally representative estimates of numbers and proportions. Survey procedures were reviewed and approved by the Research Ethics Review Board of the National Center for Health Statistics and by the institutional review board of the contracting organization, the University of Michigan [1].

Prevalence of surgical sterilization was estimated from data reported by men and women of their own sterilization history. Estimates of vasectomy prevalence for men were based on the following questions that men were asked about their experience with vasectomy:

“Some men have operations that make it impossible for them to father a child. Have you ever had a vasectomy or any other operation that makes it impossible for you to father a child?”

If they answered “yes,” then they were asked “What type of operation did you have? Was it a vasectomy or some other operation?”

Based on the response to this question, we identified men who had undergone vasectomies.

Similarly, estimates of women’s use of tubal sterilization were based on women’s responses to the following question:

“Have you ever had both of your tubes tied, cut, or removed? This procedure is often called a tubal ligation or tubal sterilization.”

Based on the responses to these questions, we computed the percentage of currently married men and women aged 15–44 years with vasectomies and tubal sterilizations. The results are based on 1750 currently married men and 2479 currently married women.

We identified which factors have bivariate associations with these sterilization methods by using  $\chi^2$  test of significance. As covariates, we included demographic characteristics, and measures of socioeconomic status and health care access. We performed multivariable logistic

regression analyses to test whether the observed bivariate differences remained significant after controlling for other factors; final logistic regression models were reduced using stepwise methods to include only predictors that were statistically significant ( $p < .05$ ). Statistical tests and confidence intervals were computed using Sudaan software to account for the complex sample design of the NSFG.

## 3. Results

NSFG data for married respondents in the 2006–2008 period indicate that 13.1% of currently married males reported they had received a vasectomy and that 21.1% of married females reported tubal sterilizations (Table 1). These percentages are equivalent to estimates of 3.2 million married men aged 15–44 years having had vasectomies (95% confidence interval, 2.4–4.1 million) and 5.7 million (4.5–6.9 million) married women aged 15–44 years having undergone tubal sterilizations. Fewer than 1% of married men and women reported using both vasectomy and tubal sterilization.

For both vasectomy and tubal sterilizations, the prevalence was higher among those at older ages and those with more children. Among race and ethnicity categories, non-Hispanic whites had the highest prevalence of vasectomy (17.4%), while non-Hispanic black and Hispanic women had the two highest prevalences of tubal sterilization (32.7% and 28.6%) compared to married women in other groups. The strong upward association of both vasectomy and tubal sterilization with age is illustrated in Fig. 1.

Vasectomy and tubal sterilization both had a strong association with education, but in opposite directions. Prevalence of vasectomy ranges from 16.7% of married men with college graduate or higher education to 3.0% for those with less than high school graduation. The prevalence of female-reported tubal sterilization was highest in the lowest education category (36.4%) and declined to 13.0% for college graduates. This reverse relationship is illustrated in Fig. 2. A similar relationship, showing opposite patterns in associations with male and female contraceptive sterilization, was observed by income categories relative to the poverty level (Table 1).

Table 1 also shows the reverse pattern for a factor that is correlated with socioeconomic status, self-reported health status. Vasectomy prevalence increased from 2.3% for those with fair or poor health to 13.1% for those with excellent or very good health. Tubal sterilization prevalence declined from 43.0% for those with fair or poor health to 17.4% for those with excellent or very good health. Finally, the pattern of association with health insurance status varies for the two sterilization methods; vasectomy prevalence was highest for those with private insurance (15.0%), and tubal sterilization was highest for those with Medicaid (23.1%) or no insurance (31.6%).

The multivariable logistic regression analysis indicated that several of these factors remain independently

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