

Relating Economic Conditions to Vasectomy and Vasectomy Reversal Frequencies: a Multi-Institutional Study

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Purpose: It was theorized that the use of permanent contraceptive methods may vary with economic conditions. We evaluated the relationship between vasectomy/vasectomy reversal frequencies at several large referral centers and national economic indicators during 2 recessions spanning 2001 to 2011.

Materials and Methods: We performed an institutional review board approved, retrospective chart review to identify the number of vasectomies/vasectomy reversals per month at several large referral centers from January 2001 to July 2011. The rates of these procedures were pooled, correlated with national economic data and analyzed in a multivariate linear regression model.

Results: A total of 4,599 vasectomies and 1,549 vasectomy reversals were performed at our institutions during the study period. The number of vasectomies per month positively correlated with the unemployment rate ($r = 0.556$, $p < 0.001$) and personal income per capita ($r = 0.276$, $p = 0.002$). The number of reversals per month negatively correlated with the unemployment rate ($r = -0.399$, $p < 0.001$) and personal income per capita ($r = -0.305$, $p < 0.001$). Neither vasectomy nor vasectomy reversal frequency significantly correlated with the inflation rate or the S&P 500®. Regression models confirmed that the unemployment rate explained more of the variance in vasectomy/vasectomy reversal frequencies than other indicators.

Conclusions: We noted a correlation between the number of vasectomies/vasectomy reversals performed at our institutions and national economic indicators. The strongest association was with the unemployment rate. This points to the importance of financial pressure on family planning decisions.

Key Words: testis, vasectomy, vasovasostomy, unemployment, income

Abbreviations and Acronyms

GDP = gross domestic product

U.S. = United States

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* Financial interest and/or other relationship with Procter & Gamble.

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APPROXIMATELY 500,000 vasectomies are performed each year in the U.S., corresponding to a prevalence of 13% of married men. Established trends among these men who turn to vasectomy for family planning include a

higher education level and income, and preexisting children.¹⁻³ In recent years several periodicals reported a new trend in vasectomy use with more occurring during economic recessions.⁴⁻⁶ The rationale for this

hypothesis is that the significant costs associated with paternity serve as incentive for permanent sterilization in bleak economic times.⁷ However, these reports were based largely on anecdotal evidence.

Thus, in this multi-institutional study we investigated the relationship between vasectomy volume and economic conditions. We also extended analysis to include vasectomy reversal, which could be negatively influenced by poor economic conditions. The frequency of vasectomy and vasectomy reversal was gathered from 3 large metropolitan centers from 2001 to 2011, a period spanning 2 economic recessions, and correlated to economic indicators.

Given the high volume of these procedures and their substantial costs, a relationship between the incidence of vasectomy/vasectomy reversal and the economy has significant implications on health care costs in the U.S. Understanding this relationship could also shed further light on patient motivation for these procedures and might allow providers to better anticipate demand for these procedures in their practice.

METHODS

In this institutional review board approved study we collected vasectomy and vasectomy reversal frequencies on a monthly basis from 3 academic medical centers located in the Western, Midwestern and Eastern parts of the U.S. from January 2001 to July 2011. This period encompassed 2 recessions, the first lasting from March 2001 to November 2001 and the second lasting from December 2007 to June 2009.

Economic data were collected from the Bureau of Economic Analysis, Bureau of Labor Statistics and other educational resources. The economic indicators used in this study were the unemployment rate, inflation rate, personal income per capita, S&P 500 monthly close, GDP growth rate and GDP gross savings rate. The inflation rate, S&P 500, personal income per capita, GDP growth and GDP savings rates are indexes that generally decrease as a result of a recession while the unemployment rate increases during a recession. Vasectomy/vasectomy reversal rates were then compared to the U.S. leading, coincident and lagging economic indexes, which are calculated on a monthly basis by incorporating business cycle data to estimate the state of the economy in the future, present and past, respectively. Thus, the association of vasectomy/vasectomy reversal frequencies with these indexes indicates how the procedure relates to a larger set of leading, coincident and lagging economic indicators.

For statistical analysis we used standard descriptive statistics and the Student t-test to initially describe the data. Pearson correlation coefficients were calculated using linear scatter plots for the entire study period. We constructed multivariate linear regression models with SPSS®, version 20.0 to identify significant correlations with procedure frequency.

RESULTS

From January 2001 to July 2011 at our institutions 4,599 vasectomies and 1,549 vasectomy reversals were performed (fig. 1). Monthly procedure frequency ranged from 16 to 60 vasectomies and 4 to 23 reversals. The monthly frequencies of the 2 procedures correlated inversely but this association was not statistically significant ($r = -0.101$, $p = 0.259$).

Procedure frequencies at all centers were then correlated to monthly economic indicators (table 1). The number of vasectomies performed per month was positively associated with the unemployment rate ($r = 0.556$, $p < 0.001$) and personal income per capita ($r = 0.276$, $p = 0.002$). The number of reversals performed per month was negatively associated with the unemployment rate ($r = -0.399$, $p < 0.001$) and personal income per capita ($r = -0.305$, $p < 0.001$). Neither the vasectomy nor the vasectomy reversal incidence significantly correlated with the inflation rate or S&P 500.

Individual center data were compared to national economic indicators to determine whether trends in cumulative data were retained at each center (table 2). The unemployment rate directly and significantly correlated with monthly vasectomy frequency at each of the 3 centers ($p \leq 0.001$), in accord with cumulative data. Personal income per capita significantly correlated with vasectomy frequency at 2 of the 3 centers. The monthly unemployment rate was the only indicator that significantly correlated with vasectomy reversal frequency at each center ($p \leq 0.014$), also in accord with the cumulative data.

To verify these relationships we constructed 2 multivariate linear regression models using the respective procedure rates as dependent variables

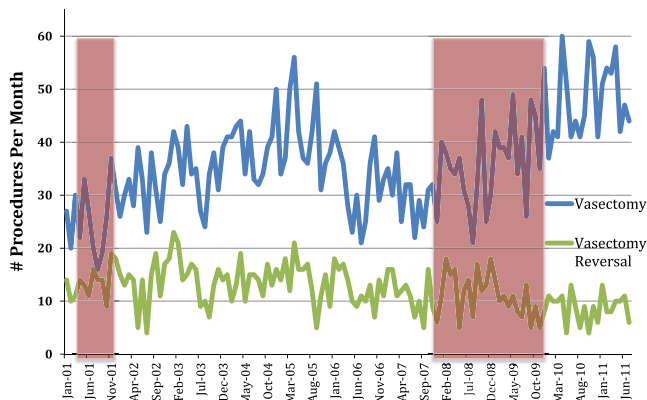


Figure 1. Monthly vasectomy and vasectomy reversal rates with time from January 2001 to June 2011. Vasectomies increased in frequency after recessions (red areas) while reversals decreased, particularly after second recession.

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