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Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic

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Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic

By

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B.S.
The College of Charleston
2019

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An abstract of
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Abstract

Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic
By Samuel Lawton

Introduction: The National Survey of Family Growth (NSFG) is issued in three-year cycles to provide nationally representative data on contraceptive use in the United States (U.S.) A lapse in data collection through the NSFG between 2019 and 2022 may act as a barrier to understanding interest in contraception, specifically vasectomy, during this time. This study utilized data from the NSFG and from a U.S. vasectomy practice to investigate characteristics, namely age at vasectomy, self-reported number of children, and relationship status, of vasectomy recipients over the past decade.

Methods: Data from the 2011-2013, 2013-2015, 2015-2017, and 2017-2019 NSFG cycles were analyzed to create descriptive statistics of vasectomy recipients aged 21-45. Weights were applied to estimate characteristics in the U.S. Multivariate regression analyses were performed to investigate the association between age and self-reported number of biological children and vasectomy uptake. Retrospective review of vasectomy clients from a U.S. vasectomy practice was performed to investigate characteristics of vasectomy recipients from 2012-2022.

Results: Data from the NSFG revealed increased utilization of vasectomy between the 2015-2017 cycle and the 2017-2019 cycle (5.19% versus 5.54%). From the 2011-2013 survey cycle to the 2015-2017 survey cycle, the estimated proportion of U.S. men ages 21-45 to have undergone vasectomy between ages 21-30 increased from 25.38% to 36.70%. Logistic regression analysis demonstrated increased likelihood of vasectomy among those in older age categories and among those with greater numbers of biological children. Data from the U.S. vasectomy practice revealed the proportion of clients reporting no children increased from 8.41% to 14.61% between 2020 and 2022.

Discussion: Analysis of data from the U.S. vasectomy practice suggested that characteristics related to family size among vasectomy recipients have been in the process of changing since the time of the emergence of the COVID-19 pandemic in the U.S. Estimates from the NSFG indicated that at a national level, those with vasectomy had begun receiving the procedure at younger ages.

Conclusion: In some settings, characteristics among those receiving vasectomy have changed over the past 10 years. Further research is needed to develop a nationally representative sample and investigate contributions to changes in vasectomy recipient characteristics.

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Introduction

Vasectomy is a permanent birth control option that was used by approximately 6% of men ages 15-44 in the United States (U.S.) in 2006. [1] A study analyzing healthcare claims estimates that in 2015, there were approximately 527,476 vasectomies performed in the U.S. [2] Older age and greater number of children are associated with vasectomy uptake. [3-5]

The National Center for Health Statistics' National Survey of Family Growth (NSFG) provides nationally representative data on contemporary contraceptive use in the U.S. [6] Researchers and clinicians rely on the NSFG to investigate trends in contraceptive use in association with characteristics of recipients such as age, number of children, and relationship status. [6] An analysis of data from the NSFG described declines in the prevalence of vasectomy across ages 18-45 from 2002 through 2017. [3] This trend was further affirmed by data from U.S. claims. [2]

Though the NSFG is generally distributed in three-year cycles, the survey experienced a lapse in data collection between the years 2019 and 2022. [7] This gap in available data poses a barrier to understanding how the public's interest in contraception, specifically vasectomy, may have changed over the course of the COVID-19 pandemic. Evidence suggests there have been changes in demand for other contraceptive methods. Average monthly clinical visits for contraceptives such as tubal ligation, long-acting reversible contraceptives, injectables, and birth control pills declined in 2020 compared to the previous year. [8] There is a need to understand how demand may have shifted for vasectomy.

The COVID-19 pandemic has led to a number of changes to healthcare provision in the United States, such as increased availability of telehealth services [9]. Changes in characteristics

of vasectomy recipients may reflect availability of funding, access to clinics, and practices' COVID-19 infection prevention measures. Up-to-date information could help assist clinical practices in their decision-making to reduce barriers to healthcare services for those interested in vasectomy. With limited publicly available data, we sought to collect de-identified patient records from a U.S. vasectomy practice to construct a dataset and investigate age, self-reported number of children, and relationship history of vasectomy recipients over the course of the COVID-19 pandemic.

Methods

Data Sources and Collection

To investigate changes in characteristics of vasectomy recipients over the course of the COVID-19 pandemic, this observational study sought data from a vasectomy practice in the southeastern U.S. This practice collected data on their patients through patient intake forms available either in-office or online during scheduling. Providers collected data about a variety of patient characteristics, including number of children, age, and relationship status. In order to perform a comparison of this dataset to a nationally representative one, this study also utilized publicly available survey responses to the NSFG for the years 2011 through 2019.

Study Population

From the 2011-2013, 2013-2015, 2015-2017, and 2017-2019 NSFG cycles, respondents who responded ‘yes,’ or ‘no’ to the NSFG cycle’s inquiry “Have you ever had a vasectomy or other male sterilizing operation” were included. For the 2011-2013, 2013-2015, and 2015-2017 survey cycles, patients missing data regarding their date of vasectomy were excluded. Since the NSFG is administered to persons between 18 and 45 years of age, observations which fell outside of the range of these values were excluded from further analysis. Though the NSFG collects data from participants as young as 18 years old, this study analyzed data from vasectomy recipients who were at least 21 years of age owing to the rare occurrence of a vasectomy performed on someone younger. The 2017-2019 NSFG cycle did not collect data regarding the date of vasectomy. Due to this missing data, our results did not include the age of vasectomy for the 2017-2019 NSFG data collection cycle.

Data provided from a U.S. vasectomy practice represents a caseload of over 28,000 patients from January 1, 2012 through December 31, 2022 with client characteristics recorded in patient intake forms. We received data from vasectomy recipients of ages 21 through 89 who completed a patient intake form at one of the participating practices from January 1, 2012 through December 31, 2022. On the recommendation of a vasectomy provider, we did not request data on patients younger than 21 as vasectomy on persons younger than 21 may be performed only in special cases. In accordance with ethics board guidelines, this study did not include observations from a practice which was known to include prisoners or any individual who was not yet an adult. To facilitate comparison to data collected by the NSFG, and to protect the privacy of the limited number of older clients, the data was trimmed to only include observations between 21 and 45 years of age. Our protocol was reviewed and approved by the Institutional Review Board of Emory University [STUDY00005628].

Analysis

Per the instructions described by the National Center for Health Statistics, sampling weights provided with the NSFG datasets were applied to each observation. With weights applied, the dataset was analyzed to estimate characteristics of men in the U.S. 21-45 years old, including those who had received a vasectomy. These characteristics included respondent age at survey completion, number of biological children, language spoken at home, race, ethnicity, relationship history, education history, health insurance status, and age at vasectomy if available. Multivariate logistic regression analyses were performed for each survey cycle to investigate the association of age and number of children on vasectomy utilization considering, race, ethnicity, relationship history, education history, and health insurance status as covariates. Due to the limited number observations, language spoken at home was removed from the final multivariate logistic regression model to address quasi-complete separation of data points.

Exploratory analysis of patient data collected from the U.S. vasectomy practice subset observations by year (2012-2022). Vasectomy recipient characteristics presented in this analysis include respondent age at patient intake, self-reported number of biological children, and relationship history.

Multiple factors related to the administration of clinical care such as closures, vaccination requirements, advertising practices, and reimbursement policies before and during the COVID-19 pandemic may have contributed to a change in patient demographics. To consider these factors, information regarding the participating practices were collected from conversations with providers and from information available on the practice websites.

Results

NSFG

Tables 2 and 3 provide estimates for characteristics of the U.S. population of men ages 21-45 utilizing weights for the corresponding survey cycles of the NSFG. Analysis of characteristics of men in the U.S. ages 21-45 revealed, as previously noted, a decline in vasectomy utilization from 2011 through 2017 [3]. However, the utilization rate increased again during the 2017-2019 cycle (5.54% from 5.19% during the previous cycle). Compared to the general population, we estimated that vasectomy utilization would be more frequent among those with larger self-reported numbers of biological children, those who spoke English at home, those who are white, those who had ever married, those who had higher education, and those with some form of private health insurance. The estimated proportion of U.S. men ages 21-45 to have undergone vasectomy between ages 21-30 increased from 25.38% to 36.70% between the 2011-2013 survey cycle and the 2015-2017 survey cycle. Logistic regression analyses (Table 4) demonstrated increased likelihood of vasectomy as age increases and as number of biological children increases across the survey cycles. However, the strengths of these associations varied from cycle to cycle. A notable limitation of our model is the exclusion of language spoken at home. This variable was excluded to address quasi-complete separation of data points.

In the 2017-2019 NSFG survey cycle, information regarding date of vasectomy procedure ceased being collected. Because of this, our analysis could only describe trends in the age of vasectomy for the first three reported cycles. Of note, no respondent with languages other than Spanish and English were recorded in the 2015-2017 and 2017-2019 cycles. Missing data from

the category “College or university degree” under education history also limited the interpretation of the education characteristic (proportion missing data: 2011-2013, 25.00%; 2013-2015, 24.50%; 2015-2017, 16.33%; 2017-2019, 20.81%). Some respondents are not reported in categories describing age at vasectomy as the calculated ages fall outside of the range 21-45 years old or because of missing data (proportion not included: 2011-2013, 2.17%; 2013-2015, 0.66%; 2015-2017, 2.04%).

U.S. Vasectomy Practice

The data collected from the U.S. vasectomy practice (Table 5) indicated that those who were between 36 and 40 years old, those who reported having two children, and those who had ever married generally represented the highest proportions within their respective characteristic categories among those who had received a vasectomy from this practice throughout 2012-2022. The proportions of vasectomy clients within each category did not noticeably change from year to year, including after the start of the COVID-19 pandemic in the U.S., with one exception. After 2020, the proportion of clients reporting no children climbed from 8.41% to 14.61% by 2022. Additionally, 2022 was the only year where the average number of children reported by clients ages 21-25 fell below 1.00 (0.83, sd = 1.22). This indicates an increasing prevalence of clients with no reported children among those recorded in this dataset.

Comparison between data collected from U.S. Vasectomy Practice and NSFG responses

Comparing data collected from the U.S. vasectomy practice to the weighted results from the NSFG revealed similar trends. For NSFG cycles 2011 through 2017 and our collected data for years 2012 through 2017, most recipients received their vasectomies when they were at least 30 years old. Furthermore, results from both datasets revealed the highest proportion of recipients had two children (NSFG: 37.20% to 49.03% of respondents; U.S. vasectomy practice: 41.66% to 45.20% of clients). While most respondents from both data sources indicated a previous marriage, the proportion of those who had ever married was noticeably higher among the NSFG data cycles than among clients from the comparable years for the U.S. vasectomy practice (NSFG: 95.93% to 98.97% of respondents; U.S. vasectomy practice: 76.95% to 79.93% of clients).

Discussion

Data analysis of clients from the U.S. vasectomy practice revealed few changes in patient characteristics across years analyzed (2012-2022) with one notable exception. The proportion of vasectomy clients reporting no children increased from 8.41% of recipients in 2020 to 14.61% of recipients in 2022. It is important to consider events within the U.S. during this time that may draw people with different than previously observed characteristics toward opting for vasectomy.

A recent review of medical records from another large healthcare organization by Bole et al. (2023) revealed an increase in vasectomy demand after the ruling in *Dobbs. v. Jackson Women's Health Organization* which rescinded protection at the federal level for abortion rights in the U.S. on June 24, 2022. [10] It is worth noting that client load increased at the U.S. vasectomy practice between 2012 and 2022 (1,974 clients versus 2,881 clients), though further analysis accounting for closures due to COVID-19 and provider scheduling is required to determine if this trend reflected

an increase in vasectomy demand at this practice. Our data may suggest that the characteristics of vasectomy recipients, especially by 2022, may have been in the process of changing. Current research suggests that potential vasectomy recipients, including younger patients, are open to telehealth counseling services. [11] The U.S. vasectomy practice offered counseling materials and patient intake/registration online. This may have appealed to younger people who, per our data, had fewer children. Accessibility to information on the practice website, such as the use and benefits of no-scalpel no-needle vasectomy methods, may have drawn a higher proportion of persons who were able to access this information and use it to inform their healthcare decisions. The out-of-pocket cost was advertised on the practice website. Information on the procedure, registration, and counseling was available through modules accessible online. Persons who were younger and reported no children were contacted for an extra counselling session via telephone by the vasectomy providers. This practice advertised use of Title X funding; however, Medicaid is not accepted. This practice also operated in multiple locations, deliberately, to reduce the barrier of travel for potential clients. Due to the COVID-19 pandemic, this practice was closed for a period of less than two months in 2022. In the years following, the U.S. vasectomy practice began requiring clients to wear masks and demonstrate proof of COVID-19 vaccination.

There are notable limitations of utilizing medical record data from a clinical practice rather than data collected from a nationally representative survey. Some characteristics of the participating vasectomy practice may impact generalizability. Changes in service procedures at this practice after the start of the COVID-19 pandemic, including the requirement for masking and, once available to the public, COVID-19 vaccination, may have impacted the interest of certain clients in seeking a vasectomy from this practice. Additional counseling practices for younger

clients and those with fewer or no children may have functioned as a barrier to receiving vasectomy from this practice for some potential recipients.

Conclusion

Trends in characteristics of vasectomy recipients at a large vasectomy practice in a southeastern U.S. vasectomy practice remained steady from 2012 through 2019. From 2020 through 2022, the proportion of patients reporting no children increased more than it had during any other year. Further research is needed to develop a nationally representative sample and further investigate events which may contribute to such a change.

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Tables

Research Table				
Source	**Purpose**	**Methods**	**Level of Evidence**	**Major Findings**
[4] Eisenberg, Henderson, Amory, Smith, & Walsh (2009)	Investigate how access to health care, socioeconomic status, and other characteristics vary among disparities in vasectomy uptake.	Retrospective review of data from the National Survey of Family Growth (2002).	Observational study; retrospective review of cases (IV).	Vasectomy was more prevalent among white persons than among Black persons (14.1% versus 3.7%). Additionally, vasectomy was not very prevalent among persons reporting Hispanic ethnicity (4.5%). Multivariate regression revealed lower odds of vasectomy among Black persons (OR = 0.20; 0.09, 0.45) and those reporting Hispanic ethnicity (OR = 0.41; 0.18-0.95) independent of demographics such as relationship status, and socioeconomic factors. Likelihood of vasectomy was greater among those who have ever been married, had two or more children, were older, and had higher income.
[12] Machen, Bird, & Kavoussi (2018)	Examine whether there is a difference between age and number of children among persons having a vasectomy in an urban setting compared to a rural setting.	Retrospective review of patient medical records (2011 to 2017).	Observational study; retrospective review of cases (IV).	Mean age at vasectomy in the urban setting was higher than the mean age in the rural setting (37.41 years versus 36.18 years). Mean number of children in the urban setting was lower than mean number of children in the rural setting (1.96 children versus 2.60 children).
[13] Santomauro, Masterson, Marguet, & Crain (2012)	Determine whether vasectomy at younger ages are more highly represented within the military.	Retrospective review of CHAMPS military database (2000 to 2009).	Observational study; retrospective review of cases (IV).	In the U.S. military, there was an age adjusted rate of vasectomy of 8.66 per 1000 men. Vasectomy most frequently occurred when the client was between 30-34 years old. Vasectomy was most prevalent among people who are white, protestant, and married.
[5] Sharma, et al. (2013)	Evaluate demographics and family planning status of vasectomized men.	Retrospective review of data from the National Survey of Family Growth (2006 to 2010).	Observational study; retrospective cohort (IV).	Multivariate regression revealed increased likelihood of vasectomy among respondents who were currently (OR = 7.814) or previously married (OR = 5.865). Likelihood of vasectomy increased with age (OR = 1.122), income (OR = 1.003), and number of children.
[3] Zhang & Eisenberg (2021)	Evaluate trends in vasectomy uptake from 2002 through 2017.	Retrospective review of data from the National Survey of Family Growth (2002 to 2017).	Observational study; retrospective review of cases and controls (IV).	Characteristics did not vary much among survey years. Vasectomy was most prevalent among persons who are white, married, non-Catholic, and those who have higher education, income, and more children. There was a decline in utilization among all age categories from 2002 to 2017.

Table 1: Research table from literature review

2011-2019 NSFG Vasectomy Recipient Respondent Characteristics (Ages 21-45)				
NSFG Cycle	2011-2013 (n = 3,583)	2013-2015 (n = 3,340)	2015-2017 (n = 3,107)	2017-2019 (n = 3,562)
Proportion vasectomy recipients (n, %)	184 (5.14%)	151 (4.52%)	147 (4.73%)	173 (4.86%)
Age at survey (mean, SD)	32.79 (5.27)	38.12 (4.61)	38.34 (4.82)	38.16 (5.01)
Quantiles (n, %)				
21-30	11 (5.98%)	14 (9.27%)	12 (8.16%)	15 (8.67%)
31-35	41 (22.28%)	27 (17.88%)	26 (17.69%)	32 (18.50%)
36-40	63 (34.24%)	52 (34.44%)	51 (34.69%)	61 (35.26%)
41-45	69 (37.50%)	58 (38.41%)	58 (39.49%)	65 (37.57%)
Age at vasectomy (mean, SD)	38.15 (4.50)	32.77 (5.40)	32.07 (5.31)	-- (--)
Quantiles (n, %)				
21-30	60 (32.61%)	45 (29.80%)	56 (38.10%)	--
31-35	47 (25.54%)	51 (33.77%)	46 (31.29%)	--
36-40	56 (30.43%)	40 (26.49%)	35 (23.81%)	--
41-45	16 (8.70%)	14 (9.27%)	7 (4.76%)	--
Biological children (n, %)				
None	13 (7.07%)	8 (5.30%)	18 (12.24%)	10 (5.78%)
1	20 (10.87%)	16 (10.60%)	21 (14.29%)	18 (10.40%)
2	65 (35.33%)	77 (50.99%)	59 (40.14%)	81 (46.82%)
3	60 (32.61%)	36 (23.84%)	36 (24.49%)	40 (23.12%)
4 or more	26 (14.13%)	14 (9.27%)	13 (8.84%)	24 (13.87%)
Language spoken at home (n, %)				
English	177 (96.20%)	147 (97.35%)	142 (96.60%)	162 (93.64%)
Spanish	6 (3.26%)	3 (1.99%)	5 (3.40%)	11 (6.36%)
Another language	1 (0.54%)	1 (0.66%)	0 (0.00%)	0 (0.00%)
Race and Hispanic ethnicity (n, %)				
Black	15 (8.15%)	14 (9.27%)	136 (92.52%)	15 (8.67%)
White	160 (86.96%)	136 (90.07%)	8 (5.44%)	148 (85.55%)
Another race	9 (4.89%)	1 (0.66%)	3 (2.04%)	10 (5.78%)
Hispanic	24 (13.04%)	14 (9.27%)	17 (11.56%)	32 (18.50%)
Relationship history (n, %)				
Ever married	175 (95.11%)	147 (97.35%)	137 (93.20%)	160 (92.49%)
Education history (n, %)				
No high school diploma or GED	12 / 184 (6.52%)	6 / 151 (3.97%)	3 / 146 (2.05%)	8 / 173 (4.62%)
At least a high school diploma or GED	172 / 184 (93.48%)	145 / 151 (96.03%)	143 / 146 (97.95%)	165 / 173 (95.38%)
College or university degree	102 / 138 (73.91%)	80 / 114 (70.18%)	75 / 123 (60.98%)	90 / 137 (65.69%)
Health insurance status (n, %)				
Private health insurance or Medi-Gap	132 (71.74%)	111 (73.51%)	118 (80.27%)	143 (82.66%)
Medicaid, CHIP, or state plan	13 (7.07%)	9 (5.96%)	6 (4.08%)	10 (5.78%)
Medicare, military health, or government plan	22 (11.96%)	11 (7.28%)	12 (8.16%)	13 (7.51%)
Single-service plan, Indian Health Service, or uninsured	17 (9.24%)	20 (13.25%)	11 (7.48%)	7 (4.05%)
Vasectomy reversal surgery (n, %)				
Ever had surgery to reverse vasectomy	3 / 180 (1.67%)	2 / 147 (1.36%)	0 / 145 (0.00%)	1 / 170 (0.59%)

Table 2: Characteristics of vasectomy recipient respondents from the National Survey of Family Growth

2011-2019 NSFG Weighted Estimates of Characteristics of Vasectomy Recipients (Ages 21-45)				
NSFG Cycle	2011-2013 (n = 48,684,726)	2013-2015 (n = 48,693,850)	2015-2017 (n = 51,994,183)	2017-2019 (n = 51,390,043)
Proportion vasectomy recipients (n, %)	3,157,532 (6.49%)	3,079,153 (6.33%)	2,985,063 (5.74%)	3,197,817 (6.22%)
Age at survey (mean, SD)	39.00 (4.05)	38.98 (4.31)	38.88 (4.74)	38.36 (4.66)
Quantiles (n, %)				
21-30	94,196 (2.98%)	179,486 (5.83%)	194,938 (6.53%)	283,995 (8.88%)
31-35	591,644 (18.74%)	503,282 (16.34%)	459,223 (15.38%)	514,634 (16.09%)
36-40	1,110,856 (35.18%)	1,005,779 (32.66%)	966,153 (32.37%)	1,152,204 (36.03%)
41-45	1,360,836 (43.10%)	1,390,606 (45.16%)	1,364,748 (45.72%)	1,246,985 (38.99%)
Age at vasectomy (mean, SD)	33.78 (5.12)	32.89 (4.89)	32.90 (5.04)	-- (--)
Categories (n, %)				
21-30	801,340 (25.38%)	771,958 (25.07%)	1,095,496 (36.70%)	--
31-35	753,952 (23.88%)	1,241,897 (40.33%)	875,496 (29.33%)	--
36-40	1,195,487 (37.86%)	818,719 (26.59%)	798,295 (26.74%)	--
41-45	339,958 (10.77%)	241,503 (7.84%)	198,712 (6.66%)	--
Biological children (n, %)				
None	168,212 (5.33%)	70,311 (2.28%)	263,937 (8.84%)	98,358 (3.08%)
1	342,827 (10.86%)	284,732 (9.25%)	397,871 (13.33%)	276,222 (8.64%)
2	1,174,524 (37.20%)	1,509,731 (49.03%)	1,325,574 (44.41%)	1,426,307 (44.60%)
3	1,027,514 (32.54%)	789,586 (25.64%)	732,629 (24.54%)	949,242 (29.68%)
4 or more	444,455 (14.08%)	424,793 (13.80%)	265,051 (8.88%)	447,687 (14.00%)
Language spoken at home (n, %)				
English	3,050,385 (96.61%)	3,033,841 (98.53%)	2,940,372 (98.50%)	2,908,985 (90.97%)
Spanish	98,231 (3.11%)	39,661 (1.29%)	44,691 (1.50%)	288,832 (9.03%)
Another language	8,916 (0.28%)	5,652 (0.18%)	0 (0.00%)	0 (0.00%)
Race and Hispanic ethnicity (n, %)				
Black	141,356 (4.48%)	148,409 (4.82%)	94,416 (3.16%)	257,069 (8.04%)
White	2,852,610 (90.34%)	2,921,978 (94.90%)	2,856,540 (95.69%)	2,811,908 (87.93%)
Another race	163,566 (5.18%)	8,767 (0.28%)	34,107 (1.14%)	128,840 (4.03%)
Hispanic	311,557 (9.87%)	170,016 (5.52%)	262,999 (8.81%)	609,762 (19.07%)
Relationship history				
Ever married	3,059,307 (96.89%)	3,047,587 (98.97%)	2,899,892 (97.15%)	3,045,169 (95.23%)
Education history				
No high school diploma or GED	175,891 / 3,157,532 (5.57%)	63,074 / 3,079,153 (2.05%)	24,070 / 2,978,243 (0.81%)	178,854 / 3,197,817 (5.59%)
At least a high school diploma or GED	2,981,641 / 3,157,532 (94.43%)	3,016,079 / 3,079,153 (97.95%)	2,954,172 / 2,978,243 (99.19%)	3,018,964 / 3,197,817 (94.41%)
College or university degree	1,940,081 / 2,521,662 (76.94%)	1,413,887 / 2,241,379 (63.08%)	1,443,286 / 2,556,002 (56.47%)	1,782,938 / 2,573,854 (69.27%)
Health insurance status				
Private health insurance or Medi-Gap	2,409,183 (76.30%)	2,464,661 (80.04%)	2,453,656 (82.20%)	2,762,634 (86.39%)
Medicaid, CHIP, or state plan	173,681 (5.50%)	120,870 (3.93%)	50,064 (1.68%)	150,562 (4.71%)
Medicare, military health, or government plan	293,753 (9.30%)	131,021 (4.26%)	233,513 (7.82%)	210,138 (6.57%)
Single-service plan, Indian Health Service, or uninsured	280,915 (8.90%)	362,602 (11.78%)	247,830 (8.30%)	74,483 (2.33%)
Vasectomy reversal surgery (n, %)	34,388 / 3,077,195	94,382 / 3,053,354	0 / 2,974,546	21,002 / 3,095,747
Ever had surgery to reverse vasectomy	(1.12%)	(3.09%)	(0.00%)	(0.68%)

Table 3: Weighted characteristics of U.S. vasectomy recipients per the National Survey of Family Growth

Odds Ratios from Logistic Regression Analysis (NSFG, Ages 21-45)				
NSFG Cycle	2011-2013	2013-2015	2015-2017	2017-2019
Categorical age at survey (OR, 95% Wald CI)				
21-30	--	--	--	--
31-35	4.145 (4.115, 4.175)	1.247 (1.241, 1.253)	1.778 (1.768, 1.788)	1.199 (1.193, 1.205)
36-40	7.077 (7.027, 7.127)	2.453 (2.442, 2.464)	3.094 (3.077, 3.110)	1.953 (1.944, 1.963)
41-45	9.645 (9.578, 9.714)	3.651 (3.636, 3.667)	4.210 (4.189, 4.232)	1.995 (1.985, 2.004)
Biological children (OR, 95% Wald CI)				
None	--	--	--	--
1	2.488 (2.473, 2.504)	3.715 (3.683, 3.747)	1.734 (1.725, 1.743)	5.438 (5.397, 5.479)
2	5.571 (5.539, 5.604)	13.476 (13.370, 13.584)	5.198 (5.175, 5.221)	20.399 (20.257, 20.542)
3	11.259 (11.192, 11.325)	18.224 (18.076, 18.374)	6.800 (6.767, 6.834)	29.986 (29.771, 30.203)
4 or more	15.908 (15.802, 16.014)	24.574 (24.361, 24.790)	4.195 (4.170, 4.220)	56.487 (56.047, 56.930)

Table 4: Logistic regression analyses comparing characteristics of age and number of biological children across survey cycles

2012-2022 Characteristics of Vasectomy Recipients from U.S. Vasectomy Practice (Ages 21-45)											
Year	2012 (n = 1,974)	2013 (n = 2,064)	2014 (n = 2,251)	2015 (n = 2,072)	2016 (n = 2,254)	2017 (n = 2,262)	2018 (n = 2,113)	2019 (n = 2,168)	2020 (n = 2,186)	2021 (n = 2,554)	2022 (n = 2,881)
Age at vasectomy											
(mean, SD)	(35.64, 5.46)	35.67 (5.41)	35.64 (5.32)	35.71 (5.29)	35.68 (5.23)	35.60 (5.09)	35.78 (5.08)	35.64 (5.16)	35.69 (5.12)	35.86 (5.18)	35.61 (5.22)
Categories (n, %)											
21-30	375 (19.00%)	384 (18.60%)	399 (17.73%)	360 (17.37%)	382 (16.95%)	385 (17.02%)	335 (15.85%)	355 (16.37%)	363 (16.61%)	415 (16.25%)	494 (17.15%)
21-25	56 (2.84%)	74 (3.59%)	71 (3.15%)	70 (3.38%)	79 (3.50%)	55 (2.43%)	66 (3.12%)	77 (3.55%)	72 (3.29%)	83 (3.25%)	99 (3.44%)
26-30	319 (16.16%)	310 (15.02%)	328 (14.57%)	290 (14.00%)	303 (13.44%)	330 (14.59%)	269 (12.73%)	278 (12.82%)	291 (13.31%)	332 (13.00%)	395 (13.71%)
31-35	573 (29.03%)	577 (27.96%)	701 (31.14%)	628 (30.31%)	705 (31.28%)	718 (31.74%)	611 (28.92%)	663 (30.58%)	650 (29.73%)	746 (29.21%)	841 (29.19%)
36-40	586 (29.69%)	655 (31.73%)	671 (29.81%)	658 (31.76%)	713 (31.63%)	721 (31.87%)	750 (35.49%)	740 (34.12%)	761 (34.81%)	867 (33.95%)	988 (34.29%)
41-45	440 (22.29%)	448 (21.51%)	480 (21.32%)	426 (20.56%)	454 (20.14%)	438 (19.36%)	417 (19.73%)	410 (18.91%)	412 (18.85%)	526 (20.60%)	558 (19.37%)
Self-reported number of children											
(mean, SD)	2.29 (1.31)	2.23 (1.23)	2.21 (1.27)	2.27 (1.57)	2.21 (1.28)	2.24 (1.26)	2.30 (1.31)	2.24 (1.30)	2.29 (1.27)	2.21 (1.33)	2.08 (1.71)
Categories (n, %)											
None	163 (8.26%)	168 (8.14%)	225 (10.00%)	193 (9.31%)	203 (9.01%)	193 (8.53%)	185 (8.76%)	186 (8.58%)	184 (8.41%)	268 (10.49%)	421 (14.61%)
1	266 (13.48%)	269 (13.03%)	296 (13.15%)	273 (13.18%)	320 (14.20%)	301 (13.31%)	255 (12.07%)	293 (13.47%)	277 (12.67%)	311 (12.18%)	363 (12.60%)
2	822 (41.66%)	933 (45.20%)	953 (42.34%)	873 (42.13%)	956 (42.41%)	983 (43.46%)	879 (41.60%)	933 (43.03%)	898 (41.08%)	1,116 (43.70%)	1,175 (40.78%)
3	461 (23.37%)	445 (21.56%)	477 (21.19%)	444 (21.43%)	511 (22.67%)	484 (21.40%)	490 (23.19%)	487 (22.46%)	518 (23.70%)	546 (21.38%)	609 (21.14%)
4 or more	261 (13.23%)	249 (12.06%)	300 (13.33%)	289 (13.95%)	264 (11.71%)	301 (13.31%)	304 (14.39%)	270 (12.45%)	309 (14.14%)	313 (12.26%)	313 (10.86%)
Biological children by age group											
(mean, sd)											
21-30	2.03 (1.27)	1.93 (1.24)	1.90 (1.33)	1.90 (1.34)	1.90 (1.32)	2.08 (1.26)	1.99 (1.25)	1.98 (1.26)	1.93 (1.30)	1.80 (1.33)	1.49 (1.37)
21-25	1.54 (1.19)	1.43 (1.38)	1.51 (1.44)	1.44 (1.29)	1.37 (1.23)	1.31 (1.23)	1.51 (1.26)	1.40 (1.18)	1.25 (1.42)	1.20 (1.23)	0.83 (1.22)
26-30	2.12 (1.26)	2.05 (1.17)	1.98 (1.29)	2.01 (1.33)	2.04 (1.30)	2.21 (1.23)	2.11 (1.22)	2.14 (1.23)	2.10 (1.21)	1.95 (1.31)	1.66 (1.35)
31-35	2.29 (1.20)	2.33 (1.18)	2.22 (1.20)	2.31 (1.24)	2.24 (1.19)	2.28 (1.16)	2.31 (2.27)	2.19 (1.11)	2.30 (1.19)	2.19 (1.18)	2.07 (1.17)
36-40	2.37 (1.30)	2.32 (1.19)	2.32 (1.18)	2.33 (1.24)	2.33 (1.19)	2.33 (1.31)	2.37 (1.23)	2.34 (1.44)	2.44 (1.22)	2.33 (1.33)	2.19 (1.21)
41-45	2.39 (1.45)	2.20 (1.31)	2.29 (1.40)	2.43 (2.40)	2.25 (1.47)	2.17 (1.31)	2.41 (1.53)	2.37 (1.33)	2.34 (1.37)	2.36 (1.47)	2.39 (2.89)
Relationship history (n, %)											
Ever married	1,519 (76.95%)	1,593 (77.18%)	1,732 (76.94%)	1,605 (77.46%)	1,798 (79.77%)	1,790 (79.13%)	1,689 (79.93%)	1,718 (79.24%)	1,670 (76.40%)	1,982 (77.60%)	2214 (76.85%)

Table 5: Characteristics of vasectomy recipients from a U.S. vasectomy practice

IRB EXPEDITED APPROVAL

March 10, 2023

Samuel Lawton

swlawto@emory.edu

Title:	Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic
Principal Investigator:	Samuel Lawton
IRB ID:	STUDY00005628
Funding:	Name: Emory University
Documents Reviewed:	• Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic, Category: IRB Protocol; • Data Upload Email, Category: Other; • HIPAA Waiver, Category: Other;

Dear Samuel Lawton:

On 3/10/2023 the Emory IRB reviewed the above-referenced study by expedited process. This research is eligible for expedited review under 45 CFR.46.110 and/or 21 CFR 56.110 because it poses minimal risk and fits expedited review category F[5] as set forth in the Federal Register.

No annual IRB review is required, as permitted under the 2018 Common Rule.

Please note carefully the following items with respect to this approval:

- Characteristics of Vasectomy Recipients in the United States During the COVID-19 Pandemic, Category: IRB Protocol;
- Data Upload Email, Category: Other;
- HIPAA Waiver, Category: Other;
- website to be disclosed. This document must be posted after the research has been closed and no later than 60 days after the last study visit of any subject.

- **Complete HIPAA and Consent Waiver:** A complete waiver of HIPAA authorization and informed consent has been granted by the IRB. Protected Health Information of which use or access has been determined to be necessary by the IRB:
    - Date of vasectomy
    - State in which the patient received vasectomy
    - Self-reported number of children at the time of completing patient intake or registration form
    - Age at the time of completing patient intake or registration form
    - Self-reported race and ethnicity
    - Primary spoken language of patient
    - Wait time between referral and consultation
    - Relationship status at the time of completing their patient intake or registration form
    - Referral type
    - Use of private insurance, Title X funding, or Medicaid funding

In conducting this protocol, you are required to follow the requirements listed in the Emory Policies and Procedures, which can be found at our IRB website.

Sincerely,

Chelsea Cassara, BS
IRB Research Protocol Analyst

Now that your submission has been approved, please take a few moments to complete the Emory IRB Satisfaction Survey. We will use your responses to improve our service to the Emory research community. We appreciate your feedback!