New Measure of Self-Defined Need for Contraceptive Services in the United States, 2023: Methodology Appendix

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This document provides further details on the data and variables used in *New Measure of Self-Defined Need for Contraceptive Services in the United States, 2023* to estimate self-defined need for contraceptive services and on the methodology for analyzing and combining national survey data with population data to make estimates at the state and county levels.

Operationalizing Self-Defined Need for Contraceptive Services

Development of a new metric to measure self-defined need for contraceptive services over a one-year period has been described elsewhere.[1] This appendix extends that work, specifying which variables were used to measure contraceptive need and applying the new metric to population data. In operationalizing self-defined need, we assumed that women's use of contraception or receipt of contraceptive services can act as a proxy for their own expression of having a need for such care. We acknowledge that these assumptions mean that the metric is not fully person-centered.

Using the 2022–2023 National Survey of Family Growth (NSFG), we measured women's current, recent or potential use of contraception or contraceptive services. Specifically, women were counted as having a self-defined need for contraceptive services and supplies if they were aged 15–49 and met any of the following criteria:

(1) current use of a reversible contraceptive method or reliance on their partner's use of vasectomy,*

(2) recent use (in the last 12 months) of a reversible contraceptive method or reliance on their partner's use of vasectomy,

(3) recent receipt (in the last 12 months) of at least one family planning service,† or

(4) report that they would prefer to use a (or another) method if they could use any method available and cost were not an issue.

To apply proportions of women with self-defined need based on national survey data to population data at the state and county levels, we examined the proportions meeting each of the criteria for self-defined need by marital status, age, income level, and race and ethnicity. Because of different patterns among the variables, rather than combining all variables into one

*Individuals using only permanent female sterilization are excluded from this category of self-defined need. Individuals using female sterilization and another contraceptive method are included as having a self-defined need for care.

†Family planning services include: 1) receipt of a method of birth control or a prescription for a method; 2) receipt of a check-up or medical test related to using a birth control method; 3) receipt of counseling or information about birth control; 4) receipt of a sterilizing operation; 5) receipt of counseling or information about getting sterilized; 6) receipt of counseling or information about emergency contraception, also known as Plan B or the "morning-after pill"; 7) receipt of emergency contraception or a prescription for it.

overall proportion of self-defined need, we created two separate proportions measuring different components of self-defined need:

- proportion reporting current use of a reversible contraceptive method or reliance on their partner's use of vasectomy (criterion 1); and
- proportion reporting any of the other three categories for self-defined need (criteria 2, 3 and 4).

Method for Combining Data to Estimate Self-Defined Need for Contraceptive Services by State and County

We estimated the number of US women in 2023 with a self-defined need for contraceptive services and supplies and the number who likely needed public support for this care by age, race and ethnicity, and income level, using three data sources:

1. US Census Bureau reports for the number of women in each US county in 2023, by age-group (15–17, 18–19, 20–29 and 30–49) and by race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other or multiple races);[2]

2. Analysis of the 2019–2023 American Community Survey (ACS) to obtain distributions of women according to marital status (married and living with husband or not married) and family income as a percentage of the federal poverty level (FPL; less than 100%, 100–137%, 138–199%, 200–249% and more than 250%) for each age-group by race and ethnicity;[3] and

3. Analysis of the 2022–2023 National Survey of Family Growth (NSFG), a nationally representative cross-sectional survey of 5,586 women aged 15–49 conducted by the National Center for Health Statistics, to estimate the proportion of women who have a self-defined need for contraceptive services for each demographic group (by age, race and ethnicity, marital status and income level as a percent of FPL).[4]

Estimates were produced by combining 2023 population data from the US Census Bureau with information on income level and marital status from the 2019–2023 ACS and characteristics of women from the 2022–2023 NSFG. For each population group—defined by age, marital status, income level, and race and ethnicity (in each county)—we multiplied the national proportion of women with a self-defined need for contraceptive services in that population group by the number of women in that population group in each county.

County-level population estimates

A total of 160 population groups for each county were used in the estimation procedure. These were defined by age (15–17, 18–19, 20–29 and 30–49), marital status (married vs. all other categories), race and ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and other or

multiple races), and family income as a percentage of the FPL (less than 100%, 100–137%, 138–199%, 200–249% and 250% or more). In addition, geographic groups were defined by the county's metropolitan status (central city, metropolitan area outside of a central city and nonmetropolitan). This level of detail was necessary to increase the accuracy of our estimates when combining national proportions of self-defined need with county-level population counts for each demographic group.

Specifically, we estimated the population of reproductive-aged women in each group in each county, using published 2023 US Census Bureau reports of the number of women in each county by age and race and ethnicity.[5] We then subdivided these groups according to women's marital status and income-level groupings based on distributions from the 2019–2023 ACS.[3] We relied on the combined five-year data set instead of the 2023 one-year data set to ensure adequate sample sizes in each of the 160 sociodemographic cells.

However, because the ACS data are reported by Public Use Microdata Areas (PUMAs)‡ rather than counties, and these geographies are not directly analogous (for example, a single county may contain multiple PUMAs or a single PUMA may be comprised of multiple counties), we used data obtained through the Geocorr 2022: Geographic Correspondence Engine,[5] run by the Missouri Census Data Center at the University of Missouri, and the CTData Collaborative (to capture county changes in Connecticut reflected in the Census 2023 file).[6] Both web-based tools produce crosswalks listing the associations between particular geographic units, for which *PUMA to county allocation factors* were calculated to describe what portion of the PUMAs total population is represented by the intersection of a PUMA and a county. Specifically, we applied the *PUMA to county* allocation factor to distribute the population of women in each county reported in the census data. The county-level proportions of women by marital and poverty status calculated from the county-aggregated ACS data were then directly applied.

Only 7% of PUMAs were directly analogous to one county. The remaining PUMAs either represented parts of a larger county or contained two or more small counties. In some cases, specific age or racial and ethnic groups had census-based county counts but no corresponding ACS PUMA data, preventing calculation of county-level marital and poverty status distributions. In these instances, we substituted state-level ACS proportions for the relevant group.

Estimating women's potential to seek contraceptive services

To estimate women's potential to seek contraceptive services and supplies or self-defined need for contraception, we drew on data from the 2022–2023 NSFG. For each of the 160 age, race and ethnicity, income level and marital status categories, we estimated both the proportion that currently used a contraceptive method and the proportion reporting one or more other indicators of self-defined contraceptive need. All estimates were made using a series of stratified logistic regression models. Model selection was performed using 10-fold cross-validation, using the

‡PUMAs are used in various US Census Bureau data sets (including the decennial census public use microdata sample (PUMS) data, the ACS PUMS data and ACS period estimates). They nest within states or equivalent entities and must be geographically contiguous. They each comprise about 100,000 residents, so some are exactly analogous to counties, some comprise more than one small county and some represent parts of a large county (which may be divided into several PUMAs).

crossfold package in Stata. Because a woman's potential to seek contraceptive services varies according to her age and marital status, most analyses (including model selection) were performed separately for unmarried adults and married adults.[§] In some cases, we further stratified estimates by metropolitan residential status, depending on which variables were most important in the 10-fold cross-validation model.

For current contraceptive use, the models indicated that the proportions were highest for older adolescents (aged 18–19) and women in nonmetro areas. Depending on race and ethnicity, income level and metropolitan status, the proportion of women aged 15–17 who were current contraceptive users varied between 8% and 43%; among women aged 18–19, the proportions varied from 20% to 68%. A separate logistic regression analysis was used to estimate the proportion of unmarried adult women aged 20–49 who were contraceptive users. Among unmarried women aged 20–29, proportions ranged from 41% to 62%, depending on race and ethnicity and poverty status. The proportions of unmarried women aged 30–49 who were current contraceptive users ranged from 23% to 39%. (The proportions of older women are lower because of their use of sterilization.) We used a separate logistic regression analysis to estimate the proportions of adult married women. Proportions varied by race and ethnicity and poverty status (7–74%).

For other indicators of contraceptive need, our logistic regression analysis found that the proportion of married adult women with this component of self-defined need varied between 19% and 26%. The proportions among unmarried adult women varied between 16% and 33%, and among adolescents, the range was 18–19%.

Limitations

As with all estimates, a certain amount of error in our figures is unavoidable. Although the population counts on which the estimates are based should be generally accurate, groups in some areas were undercounted, as mentioned above. In addition, the estimated proportions of women who were current contraceptive users or had at least one other indicator of contraceptive need for each demographic group within counties are based on national and metropolitan status data and may differ from the actual proportions for groups within counties.

Furthermore, we acknowledge certain changes in data collection for the 2022–2023 NSFG that may have resulted in a less representative sample than previous rounds. It is not clear if or how the changes in the NSFG study design may have impacted this analysis, especially given our complex methods that use multiple data sources, not just the NSFG. We compared the detailed estimates of proportions of women in need for the 160 age by race by poverty by marital status groups between the 2022–2023 NSFG and 2017–2019 NSFG and found some differences consistent with the new way of measuring need. We did not find any clear biases in estimation of need within specific age, income level, or racial and ethnic groups and therefore cannot predict the direction of any bias that might exist in relation to the overall estimates.

[§]Due to the small sample size of married adolescents, all individuals aged 15–19 were analyzed together, regardless of marital status. This is a change from the approach taken in prior reports.

In some of the state-level tables, racial and ethnic group totals do not sum to the overall total because the group of women reporting other or multiple races is not always shown separately, although it is included in the overall total. Our methodology for estimating numbers of women who likely needed public support for contraceptive services and supplies is based on estimating the proportion of women according to multiple demographic characteristics and their likely need for publicly supported care using the NSFG, and applying those proportions to county-level census data. Therefore, it is not possible to look separately at groups with small numbers of women, such as those who identify as Indigenous or Asian and Pacific Islander.

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