



PAHS

Postpartum Assessment of Health Survey

PAHS 2020 Technical Documentation

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Leveraging Policy to Improve Maternal Health in the Fourth Trimester
Columbia World Projects
Columbia University

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State and City Partners

The PAHS is a collaboration between Columbia University and the following state and city partners:

- Kansas Department of Health & Environment
- Michigan Department of Health and Human Services
- New Jersey Department of Health
- New York City Department of Health and Mental Hygiene
- Pennsylvania Department of Health
- Utah Department of Health
- Virginia Department of Health

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1 Overview

The Postpartum Assessment of Health Survey (PAHS) is a multi-state survey, leveraging the Pregnancy Risk Assessment Monitoring System (PRAMS) infrastructure to collect data on health outcomes; overall well-being; behavioral risk factors; social determinants; and health care access, quality, and costs for individuals one-year postpartum. The PRAMS is a population-based surveillance system, overseen by the U.S. Centers for Disease Control (CDC) in partnership with participating state and local health departments, that samples mothers/parents from birth certificates to identify those who have recently given birth. The PRAMS sampling frame covers approximately 83% of births in the United States (Shulman, et al. 2018).

The PAHS is a collaboration between Columbia University and the health departments of six states—Kansas, Michigan, New Jersey, Pennsylvania, Utah, and Virginia—and New York City (“sites”). It extends the PRAMS survey methodology to re-survey 2020 sample respondents from the seven sites around the time of their child’s first birthday (6 to 9 months after the PRAMS survey).

This document describes the sample design of the PRAMS, how the PAHS sample is derived from the PRAMS, and the weighting methodology employed to reduce the bias and variance of PAHS survey measures. Starting with the PRAMS weights, which account for the frame coverage, sampling, and nonresponse in the PRAMS, we made further adjustments to account for nonresponse to the PAHS, calibrate weighted estimates to known population totals, and trim extreme values.

Lastly, this document provides guidance for how to calculate estimates of the standard errors that account for the PRAMS/PAHS survey design. Replicate weights are a commonly used method for variance calculation in complex national surveys (e.g., American Community Survey). Replicate weights may be useful for passing along information necessary for specifying the sample design that cannot be made public due to confidentiality concerns or where specifying other weighting adjustments that implicate variance estimation (e.g., calibration) would be excessively cumbersome for researchers. We provide replicate weights with the research data file for these reasons and include example code in this document. We also provide instructions for calculating survey-weighted estimates and standard errors using the Taylor linearization method.

2 Sample Design

2.1 PRAMS Frame Construction

The population of interest for the 2020 PRAMS—and by extension the 2020 PAHS—is people who delivered a live-born infant in 2020. The sampling frame used to identify this population, and from which the PRAMS sample is drawn, begins with the list of newly issued birth certificates. As the PRAMS is state-based, each state’s list of birth certificates does not include births of residents that occurred out-of-state, and the sharing of information between states often occurs too late to be included for sampling and surveying. The list of birth certificates also implicitly excludes stillbirths, fetal deaths, and abortions, which are not recorded with states’ birth certificate, but may be recorded in separate vital statistics registries. Live-born infants that have died shortly thereafter are included in the survey frame.

The PRAMS frame is further restricted to remove other cases that are not in scope for the target population or that would present challenges to data collection. Birth certificates for infants born to non-resident parents are excluded as out of scope. Records processed six months or more after parturition, those missing crucial information like the birthing parent’s name, and birth certificates where only an adoptive or intended (in the case of surrogate births) parent’s name is recorded are excluded for operational reasons. If gestational parents can be identified in cases of adoption or surrogacy, they may be eligible for participation. If a birth certificate was processed less than 2 months after parturition, the record is held aside and included in the next eligible sampling frame.

For multiple gestation infants, a single birth certificate from twin and triplet sets are randomly selected as the “representative infant” and used for sampling. If a member of the twin or triplet set resulted in fetal death, only a live-born infant is included in this selection. Birth certificates for multiple gestations sets of four or more infants are excluded from the frame.

2.2 PRAMS Sample Design

After the PRAMS frame has been pared down to the eligible population, birth certificates are assigned to sampling strata that reflect subpopulations of interest that may require oversampling. Starting in April of the surveillance year (for January births) and continuing each month until July of the subsequent year (for December births), the PRAMS sample is drawn from the frame using sampling fractions intended to produce a sample that, after applying assumptions about nonresponse rates, is large enough to produce estimates with reasonable precision. A size of at least 400 respondents is the usual target for each stratum. For some small strata, all eligible cases may be selected for the PRAMS: a sampling fraction of one.

Table 2-1 Sampling strata definitions by PAHS site

| Site | Sampling Strata | # of Strata |
|------|---|-------------|
| KS | Birthweight | 2 |
| MI | Birthweight, maternal race, geographic area | 5 |
| NJ | Maternal race/ethnicity, smoking status | 6 |
| NYC | Birthweight | 2 |
| PA | Birthweight | 2 |
| UT | Birthweight, maternal education | 4 |
| VA | Geographic area | 3 |

In the 2 to 4 months after selection, sampled individuals are contacted by mail inviting them to participate in the PRAMS and provided with the survey questionnaire. Mailing materials gave the option to either return the completed paper questionnaire in a pre-stamped envelope or complete the survey online. Mail and web nonrespondents were then followed up with telephone calls, when a valid phone number was known. More detailed information about the PRAMS data collection operations are included in the PRAMS Model Protocols (2018).

2.3 PAHS follow-up study.

The PAHS sample extends the PRAMS sample design, re-surveying the 2020 PRAMS respondent sample from the 7 PAHS sites, 6 to 9 months after the initial PRAMS interview, at or around the time of the child’s first birthday. There is no systematic subsampling for the PAHS, however not all PRAMS respondents participated. During Phase I of the PAHS protocol, an opt-out card was included in the PRAMS mailings (or read at the end of the PRAMS telephone interview) in six of the seven sites. In Michigan, PRAMS respondents were instead asked whether to opt-in to the PAHS study. PRAMS respondents that chose not to participate were excluded from the list of individuals to be contacted about the PAHS questionnaire.

Those PRAMS respondents that did not opt-out or who affirmatively opted-in were then contacted via postal mail and email with information to complete a web-based questionnaire. Participants were sent an initial letter or email around the time of their child’s first birthday. Follow-up reminders were also sent weekly before attempting to contact and collect the PAHS responses via telephone. The window for PAHS response closed two months after initial contact (end of the 14th month after birth).

The PAHS questionnaire contained 108 core questions about health and well-being; social needs; and health care in the first year postpartum, largely using validated question designs from other population health surveys. PAHS was offered in both English and Spanish. Each site also included 5-10 additional flex questions about specific topics of relevance to that jurisdiction. Respondents typically spent about 40 minutes completing the survey and

received a \$45 gift card for completing the questionnaire. The majority of PAHS respondents completed the survey online (87.4%) and in English (92.9%).

Table 2-2 PAHS follow-up schedule

| Day of Release | Mode of Contact | Phone |
|------------------------------|------------------------------|------------------|
| 1 (12 months after birth) | Welcome Letter and/or Email | |
| 7 | Reminder Letter and/or Email | |
| 14 | Reminder Letter and/or Email | |
| 28 | Reminder Letter and/or Email | Phone Contacts |
| 53 | Reminder Letter and/or Email | Phone Contacts |
| 70 | Online Survey Closes | Phone Phase Ends |

Table 2-3 PAHS response by mode and language

| Site | % Online | % Telephone | % English | % Spanish |
|--------------|-------------|-------------|-------------|------------|
| KS | 97.2 | 2.8 | 98.1 | 1.9 |
| MI | 90.9 | 9.1 | 100 | 0 |
| NJ | 78.6 | 21.4 | 86.2 | 13.8 |
| NYC | 76.6 | 23.4 | 84.9 | 15.1 |
| PA | 88.6 | 11.4 | 94.4 | 5.6 |
| UT | 91.1 | 8.9 | 96.6 | 3.4 |
| VA | 87.6 | 12.4 | 92.0 | 8.0 |
| Total | 87.4 | 12.6 | 92.9 | 7.1 |

2.4 PRAMS and PAHS Response

Participation with the PRAMS and PAHS is voluntary. The total 2020 PRAMS sampling frame across the 7 sites was N=14,314. After being selected into the PRAMS sample, some individuals could not be reached or chose not to participate. The weighted PRAMS response rate across the 7 sites was 52.3%, ranging from 57.6% in Virginia to 66.9% in Utah, resulting in a total PRAMS sample size of N=8473. All PRAMS respondents were given the option to opt-out of the PAHS follow-up in 6 sites. In Michigan, PRAMS respondents had to affirmatively opt-in to the PAHS follow-up. Across the 7 sites, 28.9% of PRAMS respondents chose not to be recontacted for PAHS (19% in 6 sites; 78.9% in Michigan). This resulted in a total PAHS sampling frame of N=6021.

Table 2-4 2020 PRAMS response rates and PAHS opt-out/opt-in rates by site

| Site | PRAMS Sampling Frame ¹ | PRAMS Response Rate, Unweighted ¹ | PRAMS Response Rate, Weighted ¹ | PRAMS Respondents ¹ | PAHS Opt-Out Rate | PAHS Sampling Frame |
|------|-----------------------------------|--|--|--------------------------------|-------------------|---------------------|
| KS | 1772 | 66.3% | 65.8% | 1174 | 17.1% | 974 |

| | | | | | | |
|--------------|--------------|--------------|--------------|-------------|--------------------|-------------|
| MI | 2538 | 54.9% | 59.2% | 1394 | 78.9% ² | 298 |
| NJ | 1715 | 64.7% | 64.8% | 1110 | 20.1% | 887 |
| NYC | 2065 | 58.8% | 61.3% | 1214 | 24.4% | 918 |
| PA | 2118 | 57.6% | 60.3% | 1219 | 20.4% | 970 |
| UT | 2328 | 60.9% | 66.9% | 1418 | 17.6% | 1169 |
| VA | 1778 | 53.1% | 57.6% | 944 | 14.7% | 805 |
| Total | 14314 | 59.2% | 62.3% | 8473 | 28.9% | 6021 |

¹Source: CDC <https://www.cdc.gov/prams/prams-data/researchers.htm#response> ²Michigan required PRAMS respondents to “opt-in” to the PAHS, which significantly affected the number of respondents.

All individuals in the PAHS sampling frame were contacted to participate according to the schedule described in Section 2.3. However, not all individuals responded and some individuals started but did not complete the PAHS survey. A “complete” response to the PAHS is defined as those who answered a sufficient number of questions (25% or more). Any respondent with a lower level of completion is a “partial” response and is excluded from the final PAHS analytic sample. From the PAHS sampling frame of N=6021, a total of N=4683 individuals responded to the PAHS. Of these, 85 (1.8%) were partial responses and 4598 (98.2%) were complete responses.

Based only on complete responses, the unweighted PAHS response rate relative to the PAHS sampling frame was 76.4%, ranging from 70.2% in NYC to 79.5% in Kansas. Response rates can also be calculated relative to the total PRAMS sample size, taking in to account both the PAHS opt-out rate and the PAHS response rate. The unweighted PAHS response rate relative to the PRAMS sample was 54.3%, ranging from 16.5% in Michigan to 67.7% in Virginia. The weighted PAHS response rate relative to the PRAMS sample was 52.4%, ranging from 18.8% in Michigan to 67.5% in Utah.

The response rates are calculated in accordance with the standards of the American Association for Public Opinion Research (AAPOR) type-2 response rate (RR2) for complex sample designs (2016). AAPOR defines RR2 as the number of interviews and sufficient partials divided by the total number of eligible individuals. Weighted response rates are weighted using the PRAMS base weights described in section 3.1.

Response rates reflect the degree to which the differences between responding and nonresponding samples may bias survey estimates, but independently, may not be good indicators of survey quality (Groves and Peytcheva 2008, Davern 2013). Nonresponse has a two-part effect on surveys. It reduces the sample size, which impacts the efficiency of estimates, and may introduce bias, if the population that responds is meaningfully different from those who do not. A nonresponse weight is used to minimize the effect of this bias. Section 3.2 discusses the statistical adjustments made to help correct for imbalance due to nonresponse in the PAHS.

Table 2-5 PAHS response rates by site

| Site | PRAMS Sample Size (Respondents) | PAHS Sampling Frame | PAHS Partial Responses | PAHS Complete Responses | PAHS Response Rate, Unweighted (relative to PAHS sampling frame) | PAHS Response Rate, Unweighted (relative to PRAMS sample) | PAHS Response Rate, Weighted (relative to PRAMS sample) |
|--------------|---------------------------------|---------------------|------------------------|-------------------------|--|---|---|
| KS | 1174 | 974 | 13 | 774 | 79.5% | 63.4% | 65.9% |
| MI | 1394 | 298 | 4 | 231 | 77.5% | 16.5% | 18.8% |
| NJ | 1110 | 887 | 16 | 671 | 75.6% | 60.5% | 60.9% |
| NYC | 1214 | 918 | 27 | 645 | 70.2% | 53.1% | 50.5% |
| PA | 1219 | 970 | 11 | 719 | 74.1% | 58.9% | 58.4% |
| UT | 1418 | 1169 | 5 | 920 | 78.7% | 64.9% | 67.5% |
| VA | 944 | 805 | 9 | 638 | 79.3% | 67.6% | 62.8% |
| Total | 8473 | 6021 | 85 | 4598 | 76.4% | 54.3% | 52.4% |

2.5 Gender Identity and Pregnancy

While much of the language used in the research literature surrounding pregnancy uses gendered terms like “woman” and “mother” and related pronouns “she” and “her”, transgender and non-binary individuals assigned female at birth do also become pregnant, carry, and deliver infants (Light, et al. 2014, Forsberg and Eliason 2020). Many states use non-gendered language on birth certificates for the non-gestational parent, but often still use “mother” to describe the birthing parent and few, if any, require identifying the gender of parents on the birth certificate (some states do permit the selection of non-binary or intersex for the child). As such, there is often no systematic way to identify gender identity of parents in the registry and thus no protocol that explicitly includes (or excludes) transgender and non-binary parents from the PRAMS survey.

The language surrounding pregnancy is becoming more inclusive, if slowly. Systematic data collection, however, can often be “behind the curve” on issues like this because survey research tends to value long-standing, “validated” phrasing and question designs. The PAHS survey provided respondents with the opportunity for respondents to identify their gender identity. However, some of the language in the PRAMS and PAHS may be gendered in a way that deters participation from non-binary and transgendered parents (Gomez, et al. 2021). Where possible, this document uses nongendered language to describe parents but when referencing specific data items from birth certificates or the PRAMS and PAHS questionnaires, the terms are used as they appear in the source material.

3 Weighting

3.1 PRAMS weights

As the PAHS extends the PRAMS design, the initial weight (w_0) for the PAHS weighting is the final analytical weight from the PRAMS. To inform researchers, we have included a description of how the PRAMS final weight is created from the sampling weight, a nonresponse adjustment, and a coverage adjustment. More information about the PRAMS weighting methodology can be found at the [CDC PRAMS website](#).

Sampling Weight: The PRAMS sampling or base weight reflects the survey's stratified sample design by adjusting the sample for differences in the sampling rates across strata. Because the PRAMS is a single stage stratified random sample, the base weight is calculated as the inverse of the sampling fraction in each sample stratum. All primary sampling units (PSUs) within the sampling stratum are given the same base weight.

Nonresponse Weight: The PRAMS methodology for nonresponse adjustment sets the weight equal to the reciprocal of the response rate within "cells" of a multi-dimensional grid of characteristics from birth certificates, collapsed in the presence of small sample (at least 25 cases in each cell) (PRAMS Methodology 2021). For all respondents in the cell, the nonresponse weight is calculated as the total number of sampled members in the cell divided by the number of PRAMS respondents in the cell.

Coverage Adjustment: The PRAMS coverage adjustment corrects for differences between the population and sampling frame. After the samples have been drawn, frame omission studies identify differences between the "true" population of births, as determined by the final calendar-year birth tape, and the frame used to generate the PRAMS sample. Births that were not eligible for sampling due to late processing or missing information may be included here. PRAMS documentation describes the under-coverage as "usually [...] evenly scattered across the state, but sometimes they are clustered by particular hospitals or counties or even times of the year" (PRAMS Methodology 2021). Misclassification of strata characteristics can also cause over-coverage (e.g., too many birth certificates categorized as low-birthweight due to a processing or reporting error). The coverage adjustment is determined by the ratio of the number of records on the final birth certificate file to the frame count within each site.

Final Weight: The PRAMS final weight is the product of the base weight with the nonresponse adjustment and coverage adjustment.

3.2 PAHS Nonresponse adjustment

PAHS nonresponse adjustment follows a different methodology than PRAMS. Instead of the multi-dimensional grid, PAHS response rates are estimated by modeling the propensity to respond as a function of birth certificate characteristics and relevant data from PRAMS

responses (Little and Vartivarian 2003). This methodology involves developing a multivariate model of response. Model specifications were chosen using cross-validated L-1 penalized (LASSO) regression for feature selection. The penalty parameter was chosen using the “one-standard error rule” to select the most parsimonious model that minimizes binomial deviance (Hastie, Tibshirani and Friedman 2009). Covariates with non-zero coefficients in the LASSO regression were then used in a logistic regression (without penalization). For each respondent, a PAHS nonresponse weight (w_{NR}) is calculated as the reciprocal of the predicted probabilities to respond (propensity scores) from the logistic model:

$$w_{NR} = \frac{1}{1 + \exp(-X\beta_{PAHS})}$$

3.3 Weight trimming

Nonresponse adjustment can cause extreme variability in the magnitudes of weights across respondents, which in turn may inflate the variance of estimates. Trimming introduces some bias back into estimates but lowers variance in a tradeoff that reduces mean square error. Extreme weights produced during nonresponse adjustment can be trimmed according to a threshold set to the median weight plus 5 times the interquartile range (Potter and Zheng 2015). The trimmed weight is set to reduce the extreme weights down to the threshold ($w_{trim} < 1$). The remaining weights are adjusted upward to keep population totals constant ($w_{trim} \geq 1$). For PAHS, 0.5% of observations had nonresponse weights that were above the trimming threshold.

3.4 Calibration adjustment

Calibration or post-stratification adjustment is a step that can further reduce the bias of survey estimates and reduce sampling variance by fixing marginal totals to known population quantities, as described in Deville & Särndal (1992). For the PAHS, calibration was performed to bring totals counts by sampling strata, maternal age, marital status, race, Hispanic ethnicity, education, and infant birthweight in line with tallies from the full birth tape. Using the set of population totals (\mathbf{t}_x) and their associated characteristics in the sample (\mathbf{x}), the calibration produces the generalized regression (GREG) estimator adjustment, defined as:

$$w_{greg} = 1 + (\mathbf{t}_x - \hat{\mathbf{t}}_x) \left(\sum_j w_j \mathbf{x}_j^T \mathbf{x}_j \right)^{-1} \mathbf{x}^T$$

where $\hat{\mathbf{t}}_x$ is the usual Horvitz-Thompson estimator for the selected characteristics, using a preliminary weight (w_j) from the combination of sampling, nonresponse, and trimming weights ($w_0 \times w_{NR} \times w_{trim}$).

3.5 Composite weight

The PAHS composite weight is the product of the PRAMS final weight, the PAHS nonresponse weight, the trimming weight, and GREG calibration weight:

$$w_{final} = w_0 \times w_{NR} \times w_{trim} \times w_{greg}$$

4 Variance Estimation

4.1 Sampling and nonsampling error

The PAHS is a stratified probability sample survey and thus is subject to sampling and nonsampling errors that affect the accuracy of estimates. Sampling errors occur when the sample differs from the population from which it was drawn. Sampling error can be decomposed into sampling variance and bias. In a theoretical distribution of random samples, sampling variance describes the spread of the distribution while sampling bias represents how different the mean of that distribution is from the population parameter.

Nonsampling errors such as frame error, nonresponse error, measurement error, and processing error may also introduce bias into the data. Efforts to minimize nonsampling errors are performed through the use of validated questionnaire design, multimodal data collection, response incentives, interviewer training, systematic data processing, and quality control. The weighting methodology described in this document use statistical adjustment to further reduce biases due to sampling and nonsampling errors.

4.2 Replicate weights

The variances that accompany estimates from the PAHS should reflect the complex sample design and weighting adjustments. As such, the usual formulas for estimating variance may not apply. Instead, the PAHS data files include a set of replicate weights, that when used with the formulas described below will produce valid estimates of variance. Example code for SAS, Stata, and R are provided to aid researchers with using replicate weight variance method.

Because it is difficult to provide all the necessary information for researchers to produce the correct post-stratification estimator of variance, a bootstrap resampling procedure is applied that simulates a sampling distribution by drawing stratified samples with replacement from the empirical distribution of the data. The replicate weights on the file reflect this resampling procedure. This method has been shown to perform well for simple and stratified random samples when there are large numbers of PSUs per strata (Rao and Wu 1988, Kolenikov 2010).

The PAHS data files contain 100 replicate weights produced from bootstrap resampling of the stratified sample design and weighting procedures. If $\hat{\theta}$ is an estimate from the survey from some function $f(y, w)$ with inputs data y and weight w , the variance of $\hat{\theta}$ can be estimated as follows where $w^{(b)}$ is the weight from bootstrap replicate b and $\hat{\theta}^{(b)}$ is the estimate as calculated using the usual survey weight ($pwgt$):

$$\hat{\theta}^{(b)} = f(y, w^{(b)}), \quad \widehat{Var}_{boot}(\hat{\theta}) = \frac{1}{100} \sum_{b=1}^B (\hat{\theta}^{(b)} - \hat{\theta})^2$$

Standard errors of means using replicate weights example code:

SAS (Version 9 or newer)

```
PROC SURVEYMEANS data = ...;  
VAR ...;  
WEIGHT pwgt;  
REPWEIGHTS repwgt1-repwgt100 /VARMETHOD=BOOTSTRAP;  
RUN;
```

Stata (Version 11.1 or newer)

```
svyset [pweight=pwgt], vce(bootstrap) bsrweight(repwgt*)  
svy: mean ...
```

R (survey package version 3.6 or newer)

```
PAHS.design <- svrepdesign(data=..., weights=~pwgt,  
  repweights="repwgt[1-9]+",  
  type= "bootstrap")  
svymean(x=~..., design=PAHS.design)
```

4.3 Taylor linearization

As stated in section 3.5, the composite weight combines all the different adjustments into a single analytic weight. When using the analytic weight, the replicate weight method most accurately reflects the design-based variance for survey estimators. However, researchers may choose not to employ the calibration step in analyses. If that is the case, variances can be estimated using Taylor linearization with either the sampling weights alone or in combination with the nonresponse adjustments. Here, researchers would only need to specify the survey weight (*pwgt*) and the stratification variable to produce weighted estimates and standard errors. Example code for SAS, Stata, and R are provided to aid researchers with using the Taylor linearization method for calculating standard errors. This method is recommended in guidance for survey-weighted analysis of the PRAMS.

Standard errors of means using Taylor linearization example code:

SAS (Version 9 or newer)

```
PROC SURVEYMEANS data = ...;  
VAR ...;  
WEIGHT pwt;  
STRATA PAHS_stratum;  
RUN;
```

Stata (Version 11.1 or newer)

```
svyset [pweight=pwt], strata(PAHS_stratum)  
svy: mean ...
```

R (survey package version 3.6 or newer)

```
PAHS.design <- svydesign(data=..., weights=~pwt,  
                        strata=~ PAHS_stratum)  
svymean(x=~..., design=PAHS.design)
```


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6 Appendices

Table A1. Comparison of PRAMS and PAHS respondents

| Demographic Variable | | Unweighted | | | Weighted | | |
|---------------------------|-----------------|-------------------|----------------------|------------------|-------------------|----------------------|------------------|
| | | PRAMS Respondents | PAHS Non-Respondents | PAHS Respondents | PRAMS Respondents | PAHS Non-Respondents | PAHS Respondents |
| Age | <20 | 3.5 | 4.3 | 2.9 | 3.4 | 4.0 | 3.4 |
| | 20-24 | 16.1 | 18.8 | 13.9 | 16.4 | 19.5 | 16.4 |
| | 25-29 | 27.7 | 27.5 | 27.9 | 27.2 | 26.9 | 26.7 |
| | 30-34 | 31.7 | 30.2 | 33.0 | 31.9 | 30.0 | 32.3 |
| | 35+ | 20.9 | 19.2 | 22.3 | 21.3 | 19.6 | 21.3 |
| Marital Status | Married | 63.5 | 57.4 | 68.6 | 63.7 | 59.5 | 63.7 |
| Race | White | 70.9 | 63.2 | 77.3 | 75.3 | 71.8 | 74.3 |
| | Black | 21.6 | 28.1 | 16.2 | 17.7 | 20.0 | 17.5 |
| | Asian | 7.0 | 8.2 | 6.1 | 6.7 | 7.9 | 7.9 |
| | AI/AN | 0.4 | 0.5 | 0.4 | 0.3 | 0.3 | 0.2 |
| Ethnicity | Hispanic | 17.6 | 16.5 | 18.5 | 19.3 | 18.1 | 19.3 |
| Education | <HS | 10.4 | 13.2 | 8.0 | 10.9 | 14.0 | 10.9 |
| | HS | 26.5 | 30.8 | 22.8 | 26.1 | 30.1 | 26.0 |
| | >HS | 63.2 | 56.0 | 69.2 | 63.0 | 55.9 | 63.2 |
| Insurance at Birth | Medicaid | 36.8 | 42.8 | 31.8 | 36.7 | 41.4 | 37.3 |
| | Private | 56.2 | 50.0 | 61.5 | 56.5 | 51.6 | 55.9 |
| | Uninsured | 4.4 | 4.3 | 4.4 | 4.5 | 4.2 | 4.9 |
| Birthweight | Low birthweight | 25.3 | 24.3 | 26.1 | 7.3 | 7.2 | 7.4 |
| Parity | Nulliparous | 60.0 | 60.2 | 59.8 | 60.2 | 60.7 | 59.8 |