



PREGNANCY RISK ASSESSMENT MONITORING SYSTEM  
A survey for healthier babies in New Jersey

*NJ-PRAMS is funded by the Centers for Disease Control and Prevention to help plan better health programs for New Jersey mothers and infants—such as improving access to high quality prenatal care, reducing smoking, and encouraging breastfeeding.*

## Summary of Survey Methodology

PRAMS is Federal-state partnership with a national scope. A standard survey protocol designed by the Centers for Disease Control and Prevention (CDC) is implemented by individual states. This document describes how PRAMS is executed in New Jersey, including how the sample is drawn, the content and administration of questionnaires, and preliminary considerations for data analysis.

### Sample Selection

The *population of interest* for PRAMS is all women who are residents of New Jersey who deliver a live-born infant within New Jersey. The survey began covering births from July of 2002, and will continue indefinitely. The *sampling frame* used to identify and select new mothers each month is the state file of electronic birth certificates, which are typically filed by the birth hospital within a week of delivery.

#### Contact NJ-PRAMS

[nj.gov/health/fhs/professional/prams.shtml](http://nj.gov/health/fhs/professional/prams.shtml)

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- New Jersey residents who give birth out-of-state are excluded as a practical consideration—birth certificates are not available in a timely way. (In 2001 these accounted for about 4% of all births to New Jersey women.)
- Multiple gestations with more than three live infants are considered a special population and were removed from the frame before selection.
- In the case of twins or triplets, one infant is selected at random as the target for all child-related questions.

In order to accomplish planned analysis objectives, the sample is stratified by race, Hispanic origin and smoking status as reported on the birth certificate. (For information on the accuracy of smoking status on the birth certificate, contact the NJ-PRAMS staff.) Women who were black, Asian, Hispanic, or smoked during pregnancy were oversampled—i.e., they were selected in higher proportions than other women. The sampling design launched in 2002 was adjusted slightly starting with infants born in 2004.

The sample is drawn each month using *stratified systematic sampling*. From each stratum, every  $k^{\text{th}}$  eligible mother from that month's list is selected, starting from a randomly drawn mother in the first  $k$ . The number  $k$ , called the *sampling interval*, is determined separately for each stratum according to the desired sample size and an estimate of the total annual number of eligible mothers.

As indicated in Table 1, the number of all eligible births, and the fraction sampled, varied considerably by stratum. While the goal of stratified sampling is to provide ample numbers of cases in each stratum for analysis, the final data file is weighted to allow statistical inferences that are representative of all

**Table 1. NJ-PRAMS Sample Design**

Stratum	Eligible births 2002-2005	Sampling interval 2002-03	Sampling interval 2004-05	Birth certificates sampled
White smokers	19,071	2 per 23	2 per 39	1,613
Minority smokers	11,038	1 per 6	2 per 21	1,793
White non-smokers	173,942	1 per 65	1 per 65	2,605
Black non-smokers	49,962	1 per 35	1 per 35	1,385
Hispanic non-smokers	87,381	1 per 43	1 per 43	1,985
Asian non-smokers	32,847	1 per 19	1 per 19	1,686
All strata	374,241	1 per 33	1 per 38	11,067

mothers in the entire population (see Weighting and Analysis, below). The actual proportion of interviews completed from the sample in each stratum also contributes to the composition and weighting of the final data file. The survey protocol's success in obtaining interviews, known as the *response rate*, is discussed under Interview Administration below.

### Questionnaire Content

The NJ-PRAMS questionnaire is built around a mandatory core developed by CDC. Topics for PRAMS are chosen by CDC and collaborating states on a multiyear cycle. Questionnaire topics are chosen to match evolving policy initiatives and needs for research and evaluation. Additional questions are contributed by the states that conduct PRAMS, and reflect individual state priorities.

Core questions address maternal health behaviors and health care experiences immediately before, during and after the pregnancy. For example, there are items on smoking and vitamin use prior to pregnancy, educational and counseling services provided by health care providers throughout pregnancy, and breastfeeding after the newborn goes home. New Jersey's supplemental questions primarily provide further depth regarding smoking and cessation during pregnancy.

Most questions use a structured, multiple choice format to facilitate comparisons across states and over time. There are many opportunities, however, for women to report unusual circumstances. All questions have been exhaustively tested by CDC to ensure a high standard of reliability and validity.

The current questionnaire is available on the NJ-PRAMS website. For more information on CDC questionnaire development activities and efforts in other states, see Further Information below.

### Interview Administration

In every state, PRAMS uses a *mixed-interview-mode* methodology. Interviews are attempted first by mail, starting two months after delivery, using mother's address from the birth certificate. If several reminders fail to yield a return by mail, the case is followed up by telephone. Each monthly batch of sampled mothers is active for about four months before further efforts stop. Both mail and phone interview phases were conducted by the Bloustein Center for Survey Research at Rutgers University. Each phase is supported by specialized survey management software provided by CDC.

Interviews may not be completed because a sampled mother could not be contacted, was unable to participate, or declined either actively or passively. Survey staff used several methods to locate mothers who had moved or changed phone numbers. All mail and telephone materials were available in English and Spanish, but mothers limited to other languages could not be interviewed. In order to maximize cooperation, all sampled mothers were given a 60-minute prepaid phone card as an incentive.

The *survey response rate* is defined as the fraction of eligible sample cases for which complete interviews are obtained. Mothers remain eligible regardless of the reasons for

**Table 2. NJ-PRAMS Production by Year**

Year	Birth certificates sampled	Interviews completed	Weighted response rate**
2002*	1,397	952	71.7%
2003	3,227	2,152	71.4%
2004	3,254	2,291	73.8%
2005	3,189	2,249	72.6%
All years	11,067	7,644	

\* Began with infants born in July, 2002.

\*\* Adjusted for unequal sampling rates across strata.

**Table 3. NJ-PRAMS Production by Stratum**

Stratum	Birth certificates sampled	Interviews completed	Response rate
White smokers	1,613	1,156	71.7%
Minority smokers	1,793	1,003	55.9%
White non-smokers	2,605	1,980	76.0%
Black non-smokers	1,385	939	67.8%
Hispanic non-smokers	1,985	1,442	72.6%
Asian non-smokers	1,686	1,124	66.7%
All strata	11,067	7,644	

nonresponse. In this survey it is appropriate to use a weighted rate that compares the returns in a stratified sample to what would be obtained in a proportional sample. In every year of operation, the weighted response rate was above the CDC minimum requirement of 70%.

### **Weighting and Analysis**

As noted above, weights must be used for most stratified samples to accurately represent the population of interest. Weights used in PRAMS adjust for the sample design and for differential *nonresponse* across strata.

The first adjustment is straightforward—*sampling weights* are the same as the stratum sampling intervals. For example, since white nonsmokers were sampled at the lowest rate, 1:65, each respondent in that stratum receives a sampling weight of 65, because she “represents” that many women in that stratum of the population that year.

Adjustment is also made for the overall level and systematic patterns of nonresponse. It is especially important that PRAMS adequately represent variations among mothers in education, age, marital status, number of prior children, child’s birthweight and timeliness of prenatal care. For any stratum where these variables were significantly associated with nonresponse, we raised or lowered the sampling weights as needed until the weighted distributions of those variables in completed interviews came back into line with the population. The weights used for 2005 interviews are preliminary until a final review by CDC staff.

Analysis of weighted survey data requires special statistical procedures. Estimates that do not incorporate weights will be biased relative to the population of interest. Furthermore, traditional measures of statistical precision and tests of significance will generally underestimate sampling error. NJ-PRAMS uses SUDAAN software for all interval estimates and statistical tests, as recommended by CDC.

#### **Further Information**

CDC PRAMS program website, including methodology, reports and resources:

<http://www.cdc.gov/prams/index.htm>

PRAMS standard methodology summary:

<http://www.cdc.gov/prams/Methodology.htm>

New Jersey PRAMS website, including current questionnaire and reports:

<http://nj.gov/health/fhs/professional/prams.shtml>