11 Evaluation

Evaluation, monitoring, and quality control of many components of PRAMS occur on a daily or monthly basis, as they are built in as routine activities and procedures. Some examples include range checks and data entry verification for questionnaire data, cleaning and editing of monthly data, and careful review of operations batch reports to monitor operations procedures and response rates. In addition, there are several areas of PRAMS that require less frequent periodic assessments. This section describes areas that are assessed no more frequently than twice a year.

11.1 Sampling Evaluation

11.1a ***Evaluation of the Sample Size.*** When sample sizes are first computed, they are based on the latest available birth data and the best guesses of anticipated response rates. Over time, birth distributions can change and better information becomes available.

As birth distributions are tabulated on an annual basis, the sample size evaluations are also conducted on an annual basis. Both evaluations are conducted by CDC shortly before sampling is scheduled to begin for a new calendar year. The birth distributions for the most recent year available are examined by stratum to determine if substantial increases or decreases have occurred since the previous evaluation.

In addition, stratum-specific response rates are computed to see if they agree with the estimated response rates. If necessary, modifications to the sampling fractions are made to maintain the desired sample size in each stratum. If births decrease and adjustments to account for these changes are not made, the resulting sample sizes may not be sufficient to make stratum-specific estimates with pre-specified precision. If births increase, sample sizes will be larger than necessary, causing an increase in staff workload. Modifications are implemented with the start of the first batch for the next calendar year of births.

11.1b ***Evaluation of the Sampling Procedures.*** Sampling procedure evaluations are conducted annually after closing out a calendar year. CDC takes the lead in conducting all four sampling procedure evaluations described below. A written summary is provided to the states when the evaluations are completed. <STATE> will be alerted if problems are identified. CDC works closely with staff to correct problems that are identified. Certain states may have restrictions on the release of

the sampling frame files. In such cases, the state is responsible for conducting these evaluations, and CDC provides state PRAMS staff with guidance and technical assistance. <STATE> will send results of the evaluations to CDC for review and interpretation.

i. ***Evaluation of Sampling Frame Bias.*** Sampling frame bias occurs if ineligible records are included in the sampling frame or if eligible records are omitted from the sampling frame. The latter is more common because of late registration of birth certificates. The sampling frame bias evaluation examines the annual sampling frame and the complete end-of-year birth tape to identify eligible records omitted from the sampling frame. Analyses are conducted to determine whether the omitted records are representative of the population of births. Particular hospitals or counties may contribute a disproportionate number of records not on the PRAMS sampling frame because of delayed registration. If so, adjustments can be made to the analysis weights to compensate for any resulting biases.

ii. ***Evaluation of Selection Bias.*** Selection bias occurs when the sample selected for PRAMS in a particular stratum is not representative of all records in that stratum in the sampling frame. The selection bias evaluation compares the sample and the sampling frame; it compares the distributions of key demographic characteristics such as maternal age, maternal education, marital status, maternal race, plurality, and county or hospital of birth. If biases are detected, the entire sampling procedures must be examined to determine why the sample was not entirely randomly selected, and adjustments to the sampling procedures are made to correct the sampling problems.

iii. ***Evaluation of the Sampling Fraction.*** CDC verifies that the stated sampling fractions are actually those that were applied by comparing the size of the sample with the size of the sampling frame for each stratum. If a discrepancy is detected, the sampling algorithms are carefully reviewed and the appropriate corrections are made so that the problem does not persist. Adjustments to the sampling weights can be applied to correct for improper sampling fractions in the affected batches.

iv. ***Evaluation of Multiple Births Selection.*** CDC verifies that the procedures for the identification and selection of multiple births are properly carried out. If more than one sibling from a multiple gestation is included in the sampling frame, an adjustment is made to the sample weight to correct for the increased probability of selection. If any other problems are encountered, the multiple birth selection

algorithms are carefully reviewed and corrections are made to prevent the problems from persisting.

11.2 Operational Evaluation (OPAL)

Proper adherence to operational and data collection procedures is essential to assure the quality and consistency of PRAMS surveillance data. The evaluation of PRAMS operational procedures involves observing and reviewing the operational and data collection activities carried out by PRAMS staff, identifying deviations from proper procedures, identifying areas that may benefit from modification, and working with PRAMS staff to correct problem areas and put suggested modifications into practice. The operational evaluation consists of several components. First, the operations batch reports generated by PRAMTrac each month are reviewed and monitored by the state. Anything out of the ordinary is noted and discussed. Review of monthly batch reports is an ongoing evaluation activity that continues as long as <STATE> is involved in data collection. Twice per year, a more detailed evaluation is conducted, using a SAS operational evaluation program called OPAL. CDC runs the OPAL using unweighted data from six consecutive batches. <STATE> and CDC staff review the OPAL together.

OPAL generates the following analyses:

- Review of state-defined options (incentives, timing of mailings)
- Analyses of mail activity
    - Time between first mailing and mail response
    - Time between when a particular mailing was sent and when that particular mailing was returned completed
    - Rates of partially completed mail questionnaires
    - Mail results by “undelivered” status
    - Demographic breakdown of records entering phone phase
- Analyses of telephone activity
    - Sources of good telephone numbers
    - Duration of telephone interviews

  - Mode of participation for records contacted by telephone
  - Percentage of records in telephone phase actually contacted by telephone
  - Mail response from telephone “will mails”
  - Telephone results by time of day of call
  - Breakdown by stratum of telephone results by time of day of call
  - Telephone success rates for each call attempt
  - Proportion of wrong numbers by source
  - Breakdown of each call sequence by time of call and result of call
- Analyses of participation
  - Ultimate response outcomes
  - Participation rates by mail and telephone
  - Response rates by infant’s age at time of first mailing
  - Mail response by type of mailing
  - Participation rates by infant survival
  - Participation rates by maternal race, ethnicity, education, marital status, maternal age
  - Mode of participation by maternal race, ethnicity, education, marital status, maternal age (respondents only)
- Analyses of data consistency
  - Consistency between maternal age self-report and birth certificate
  - Consistency between infant date of birth self-report and birth certificate

The results of these analyses provide a good indication of how well PRAMS operational procedures are being carried out. These results also show whether the procedures are producing the desired results. The final component of the operational evaluation is a site visit to the state to monitor operations. The first

site visit occurs when the first six to eight batches of data are completed and after the OPAL runs have been generated (usually about a year after the onset of data collection). CDC staff review the results of the OPAL analyses with the PRAMS staff and observe PRAMS staff carrying out the daily operations. When problem areas are identified, recommendations are made to correct the problems.

After the initial detailed operations evaluation, repeat evaluations are conducted periodically. The OPAL analyses will be generated on six batches of operational data and may be reviewed during a site visit or conference call.

11.3 Data Quality Evaluation

To ensure data quality, periodic evaluations of PRAMS data are necessary. CDC and <STATE> both have roles in conducting these evaluations. Problems found with the data should be cleaned up or corrected. Depending on the nature of the problem, either <STATE> or CDC may be the appropriate source to make the corrections. Described below are details that are examined from each data source.

11.3a Batch Data. CDC evaluates the batch data and, depending on the nature of the problem, <STATE> and/or CDC will be involved in cleaning and correcting the data.

i. ***Birth Certificate Data.*** Frequencies should be examined to make sure the variables are properly coded as specified by the CDC formats. All missing or unknown values should have a valid missing numeric code. There should be no fields with missing data. There should be no extraneous characters such as dashes, slashes, periods, etc., in any field. Only variables that are not collected on the birth certificate should be coded as "not reported." Variables with an excessive proportion of missing data should be identified and discussed with the vital records office.

ii. ***Operations Data.*** Examination of the operations data should focus on looking for blanks and improper values, especially for variables that are obtained by being keyed into PRAMTrac.

iii. ***Questionnaire Data.*** Examination of variables from the PRAMS questionnaire should be conducted to check data consistency. Using SAS frequencies, checks for data consistency should focus on proper flow of skip patterns, correct coding, and completeness of data. This can be accomplished by checking denominators from question to question, checking the coding of categories, and looking for

unexplained missing values. When problems are identified, solutions should be identified and carried out if possible.

11.3b ***Weighted Data.*** It is recommended that the weighted data set provided to each state by CDC be reviewed by the state for two main purposes:

i. ***To check data consistency.*** Checks for data consistency should focus on proper flow of skip patterns, correct coding, and completeness of data. This can be accomplished by checking denominators from question to question, checking the coding of categories, and looking for unexplained missing values. When problems are identified, solutions should be identified and carried out if possible.

ii. ***To become aware of potential "problem" questions.*** Examining preliminary questionnaire data can also make PRAMS staff aware of potential "problem" questions. These include questions with large numbers of "other" category selections; questions that receive large numbers of comments and questions with categories selected by less than 5% or more than 95% of respondents. Often, these problems will not be correctable until <STATE> develops a new questionnaire. However, knowing which questions might pose problems in analysis can be helpful information.

Running frequencies ensures a better understanding of the information provided by the weighted data set and verifies that the frequencies obtained coincide with state characteristics.

11.4 Evaluation of the Objectives of PRAMS

When the annual progress report for CDC is prepared, the objectives of PRAMS are reviewed, and the progress made toward meeting those objectives is evaluated. The essential question to ask is, "Does PRAMS serve a useful purpose?" To be of maximum value, the data should be incorporated meaningfully into policy decision making and planning and should drive program development and implementation.

When evaluating the objectives of PRAMS, the following aspects are considered:

- Identify and track potential users of the data.
- Determine how the information is disseminated.
    - Published manuscripts

- Other

- Determine what types of information from PRAMS are most useful or most in demand.

- Determine what actions have been taken as a result of PRAMS data.
  - Influence policy decisions.
  - Generate political support (to get legislation passed).
  - Secure funding.
  - Generate public interest and support.
  - Assess progress toward state and national health objectives.
  - Assess interventions.

- Identify potential barriers to use of data.
  - Determine if adequate staff are available for data analysis and interpretation (see **Section 7.1a** for further details).
  - Determine if there are information needs that are not met by PRAMS.
  - Determine if there are barriers to using PRAMS data and, if so, what they are.