

Tool Kit for Monitoring and Evaluating Breastfeeding Practices and Programs

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ACRONYMS

| | |
|----------|---|
| BFHI | Baby-Friendly Hospital Initiative |
| DHS | Demographic and Health Surveys |
| DHS-I | Demographic and Health Survey I (first DHS survey conducted in the country) |
| DHS-II | Demographic and Health Survey II (second DHS survey conducted in the country) |
| EBF | Exclusive breastfeeding |
| EBR | Exclusive breastfeeding rate |
| EPI | Expanded Program on Immunization |
| Epi Info | A word processing, database, and statistics program for public health |
| FP | Family planning |
| HIS | Health information system |
| IEC | Information, education, and communication |
| IGAB | Inter-Agency Group on Breastfeeding (now BOCA) |
| IRH | Institute of Reproductive Health, Georgetown University |
| IUD | Intrauterine contraceptive device |
| LAM | Lactational Amenorrhea Method |
| MADLAC | Monitoreo de Apoyo Directo con La Lactancia en Los Hospitales/Monitoring of Support to Breastfeeding in Hospitals |
| MCH | Maternal and child health |
| MDBF | Mean duration of breastfeeding |
| MDLA | Mean duration of lactational amenorrhea |
| MIS | Management information system |
| NGO | Non-governmental organization |



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| | |
|------------------|--|
| ORS | Oral Rehydration Salts |
| PBF _a | Percent breastfeeding |
| PBF | Predominant breastfeeding |
| PBR | Predominant breastfeeding rate |
| PLA | Proportion experiencing lactational amenorrhea |
| RHIWG | Reproductive Health Indicators Working Group |
| UNICEF | United Nations Children's Fund |
| USAID | United States Agency for International Development |
| WHO | World Health Organization |



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CHAPTER ONE: INTRODUCTION

The programmatic support of optimal breastfeeding is a new field. In the past, mothers passed breastfeeding skills to daughters. Today facility and program staff have taken over much of the reproductive health teaching responsibilities. Monitoring programs to determine if their promotion activities are producing the desired outcomes is vital for program success, while evaluation of changes in breastfeeding practices and the concomitant promotion activities can help to provide information needed to revise policies and programs.

Breastfeeding interventions differ from many other health-related interventions. Mothers' breastfeeding practices today are influenced by the health care sector and, since breastfeeding is also a cultural practice, the society at large. Those working in the formal and informal health sector influence breastfeeding through health service delivery practices (e.g., prenatal care, delivery, postpartum and child health care), policies, and promotional activities. Those working in the community influence breastfeeding through the media and by directly influencing mothers, families, and the broader community. Therefore, programs that integrate comprehensive breastfeeding promotion must include activities both in the health sector and in sectors that influence the community at large.

Breastfeeding monitoring and evaluation share an issue common to nearly all health-related activities. Measurement must address both the intervention *activities* (e.g., policy changes, promotion activities) and the intended outcomes (e.g., breastfeeding *behavior*). Even if a program were to measure all of the promotional activities occurring in both the health sector and the community, it would not be sufficient to determine whether the program was influencing mothers' practices. It is essential to measure breastfeeding practices themselves.

Monitoring breastfeeding programs and evaluating breastfeeding practices is challenging for several other reasons:

- There is no single product that can be distributed and thus counted, nor is there a single service to be delivered.
- While many health interventions can be tracked with only a general reference to the child's age (e.g., less than one year), tracking breastfeeding practices generally requires accurate assessment of the infant's age to be useful.
- Questions about breastfeeding often require more than a "yes" or "no" response.
- There are a multitude of factors that define whether breastfeeding is optimal.



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Purpose of this Tool Kit

The purpose of this Tool Kit is to provide program managers with practical methods to facilitate the monitoring and evaluation of breastfeeding practices. This Tool Kit expands on the *Indicators for Reproductive Health Program Evaluation: Final Report of the Subcommittee on Breastfeeding*¹ (1) by providing guidance tailored to program managers working in the field. Sample questionnaires are provided and illustrations given of the minimal questions required for various program purposes. Examples of more detailed questions that can further enhance the understanding of breastfeeding practices are also shown. Examples illustrate how the data collected in these questionnaires can be analyzed. In addition, advice on determining the sample sizes needed for monitoring and evaluation and some common pitfalls to avoid in measurement of breastfeeding practices are also furnished.

Audience for this Tool Kit

This Tool Kit is meant to help program managers assess breastfeeding *programs and practices*. Because much research has been done on breastfeeding, there is a great deal of experience in the research community on collecting data on breastfeeding and analyzing it with advanced statistical techniques. Since the intent of this Tool Kit is to provide methodologies useful for managers and field staff, this Tool Kit is *not* designed specifically for academic or theoretical researchers. However, academic researchers who are new to the field of breastfeeding may benefit from the discussion of the methodologic issues.

Where To Seek Help

While this Tool Kit will provide guidance on monitoring of programs and evaluation of breastfeeding practices, it may be necessary to seek help if there is uncertainty about whether the required information can be obtained from the current monitoring system. Help may also be needed if a more extensive evaluation is planned. In such cases, demographers or epidemiologists who have had previous experience with national health and demographic surveys may be able to provide the needed technical assistance. Specialists in the field of breastfeeding can help determine how to ask the appropriate questions to determine which breastfeeding practices are most critical within the target population of interest. See Appendix 1 for a list of organizations that could provide assistance finding appropriate breastfeeding professionals.

¹ The Subcommittee was also known as the Reproductive Health Indicators Working Group (RHIWG) and is referred to as such in the remainder of the Tool Kit. This report is available from: The EVALUATION Project, Carolina Population Center, University of North Carolina at Chapel Hill, CB 8120 University Square, Chapel Hill, NC 27515-3997, USA.



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What Does this Tool Kit Contain?

Chapter Two briefly discusses the differences between monitoring and evaluation of breastfeeding. Some of the basic issues related to sampling and sample size for studies or surveys used in evaluations are discussed. In addition, suggestions are given on where to find more detailed guidance on sampling considerations and on determination of sample size. Chapter Three provides examples of indicators used to track program activities that promote good breastfeeding practices and indicators used to assess women's actual breastfeeding practices. A list of the questions that can be used to collect those data required to calculate each indicator is also included in this chapter. Chapter Four outlines common pitfalls to avoid in measurement of breastfeeding indicators.

The Tool Kit also contains several appendices. Appendix 1 contains a list of organizations that could be of assistance to individuals interested in monitoring and evaluating breastfeeding practices and promotion. Appendix 2 contains a guide for calculating age. Appendix 4 provides definitions for each indicator and illustrative computations where helpful. The material in these pages is taken almost entirely from the work of the RHIWG. Appendix 4, however, contains additional illustrative computations based on data in Tables 7 and 8 of Appendix 3. Additional questionnaires are included in Appendix 5, and Appendix 6 contains data on breastfeeding indicators from different countries. Appendix 7 provides sample size requirements for conducting cross-sectional studies. The sample size needed varies according to the prevalence of the practice of interest among the study population. Appendix 8 contains the LAM Algorithm and Appendix 9 contains an illustration of the use of Indicator 9 (Full/Partial/Token Breastfeeding) for use in assessing breastfeeding behavior change over time.



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CHAPTER TWO: WHY MONITOR OR EVALUATE BREASTFEEDING PROGRAMS AND PRACTICES?

The broad issues involved in assessing breastfeeding promotion and support activities are generally similar to those relevant to other health programs. These include planning, training, supervision and implementation issues (including coverage of the target population and the quality of services provided). There are two basic types of objectives discussed throughout the remainder of the chapter: process and outcome objectives. Process objectives address use of resources and activities and services.² Outcome objectives address the short- and long-term behavioral effects that result from these program activities. Monitoring or tracking of program *activities* in relation to the program objectives can help program managers assess their progress in promoting activities (such as the percent of trainings completed) and in reaching objectives (such as increasing the percent of women who exclusively breastfeed for six months). Monitoring also allows managers to make appropriate changes when objectives are not being met. Monitoring of the breastfeeding practices of a community will help managers determine whether the current level of activities is having the expected impact on *practices*.

Box 2.1 gives examples of indicators within each of these objectives.

| Box 2.1 Framework for Monitoring and Evaluating | | | | |
|--|--|--------------------|----------------------|--------------------|
| ----->Processes-----> | | | ----->Outcomes-----> | |
| Resources | Activities | Services | Effects | Impacts |
| | | | Knowledge | |
| | | | Attitudes | Health |
| | | | Beliefs | Nutritional Status |
| | | | Practices | |
| Counselors | Group meetings | Mothers | % Exclusively | % Malnourished |
| Funding | Home visits | counseled | breastfed, | |
| | Community Educ. | Breastfeeding | 0 - <6 months | |
| | Supervision | practices assessed | Median duration | |
| | Training | | of amenorrhea | |
| | Production of training manuals, counseling cards | | | |

² In the field of program evaluation, the terms inputs, processes, and outputs are often used in reference to resources, activities, and services.



Source: Adapted from the Evaluation Project, Reproductive Health Indicators, 1995.

This two-level assessment, i) following progress on program activities and whether they are meeting process objectives, and ii) following progress on breastfeeding behaviors and whether they are meeting the outcome objectives, is the essence of program monitoring and evaluation.

It is important for each program manager or evaluator to be very clear about his or her reasons for selecting particular breastfeeding promotion process or outcome indicators. Indicators are selected to reflect progress on the objectives at hand, and the selection of objectives is an important first step in the design of any program or project.

Monitoring And Evaluation For General Purposes

Program managers may wish to monitor or evaluate their activities for different reasons. The following are frequently noted:

- 1) To set priorities for resource allocation: *Does inclusion of breastfeeding promotion by immunization workers reduce their immunization coverage (requiring an increase in the number of workers needed), does it make no difference, or does it result in even higher immunization rates?*
- 2) To provide information to educate and motivate staff and increase staff satisfaction: *Does tracking & displaying the number of counseling sessions conducted by volunteers help to motivate them?*
- 3) To assess quality of services: *What proportion of health workers mention child feeding during a well child visit?*
- 4) To assess coverage: *What proportion of pregnant women was counseled during the last month?*
- 5) To assess training and supervision needs: *Are counselors able to affect client behavior? Did they score above 70% on a competency test?*
- 6) To compare the successful units to the unsuccessful for increased understanding of personnel activities and community issues: *Are there different levels of counseling in each area? Are the counselors better prepared/motivated/active in one area vs. another?*

Monitoring and Evaluation to Meet Donor Requirements



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Donor agencies often have very specific data requirements for assessing whether funds were well spent or to gauge progress for renewal of funding. Therefore, the reasons to use monitoring and evaluation because of donor requirements include:

- 1) Providing proof of achievement of preset objectives to qualify for donor assistance and for donors to justify expenditures and future requests: *Did changes in breastfeeding practices result from the program?*
- 2) Providing information about program to policy makers, community members, colleagues: *What proportion of women delivers at a health facility?*
- 3) Gathering necessary data to encourage policy changes: *What proportion of infants consumes infant formula? What percentage of breastfeeding women uses family planning?*

Monitoring and Evaluation to Provide the Community with Information for Decision-Making

If the program is started with a general interest in the community's health, but also with the knowledge that the community does not yet perceive the program as a priority, it may be necessary to provide process and the outcome results that convince community members, especially decision-makers, of the need for their resources and support. Reasons to use monitoring and evaluation because of community requirements include:

- 1) Informing community leaders about local practices: *What proportion of mothers uses bottles?*
- 2) Encouraging community interventions by increasing community understanding of the potential benefits: *Demonstrate the effects of breastfeeding on fertility.*

What Is the Difference Between Monitoring and Evaluation?

Monitoring is careful and pre-planned data gathering designed to aid in the assessment of whether or not objectives are being achieved. Information intended to be used for monitoring purposes is often gathered on an ongoing or continuous basis. The collection of such information is often linked to or an integral part of the day-to-day functioning of the program. While the results of the monitoring activity should be used as feedback into program on an ongoing basis, the monitoring findings are also useful during more extensive, and periodic program evaluations. In some cases, such evaluations will also include additional special studies or surveys if the necessary information can not be derived from the regular monitoring system. Whenever additional studies are added, costs will increase.



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The goal of evaluations of breastfeeding programs is to illustrate whether there have been changes in breastfeeding practices and whether these can, with statistical validity, be attributed to the program.

Generally, monitoring should be based on data that are easily gathered in an ongoing or periodic manner, and therefore, data gathered should be strictly limited to those indicators that are necessary to assess specific objectives. Because evaluation occurs less often, it can be more detailed and include data that take a significant period of time, and hence, cost, to collect. Research that is carefully planned to answer pre-selected questions and requires sophisticated analyses is not the topic of this Tool Kit.

To monitor and evaluate in a cost-effective manner, easily understandable, measurable objectives must be designed. Furthermore, indicators, the measures of stated objectives, must be clear and quantitative whenever possible, and must be relatively easy to analyze from the data. However, it must be recognized that even gathering monitoring data takes time and requires training for those who will be responsible for data collection. The most cost-effective approach, when possible, is to select measures based on the ongoing health information system or to incorporate a few selected measures into that system.

How To Decide on Your Approach to Monitoring and Evaluation?

Several types of data sources are likely to be used to obtain the information needed to monitor and evaluate program progress: different sources will provide data for different types of indicators. Sometimes data can be collected from available records and other times separate studies may be required.

The following data sources are often used in monitoring and evaluation:

Existing Records: Monitoring data often allow examination of changes from baseline levels of activity, knowledge, or practices. It may be possible to obtain such baseline information from existing records or record systems. Obtaining baseline data from existing studies or record systems can be the most economically efficient method of collecting any needed information and exploring this possibility should be part of any data collection strategy. However, existing records may not contain some of the required information, e.g., accurate age data for infants. Such records may also be difficult to review for monitoring purposes.

Health or Management Information Systems (HIS/MIS): Health or Management Information Systems may already exist. For example, a good supervisory system will include a MIS so that ongoing programs can be monitored. If such a system already exists, it may be possible to collect a small amount of additional information to get data on some of the process indicators. In some instances, it might even be possible to obtain information about current breastfeeding practices.



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Again, age data will be needed and ages may not be recorded in MIS systems in small enough intervals nor breastfeeding practices in sufficient detail to assess practices accurately.

Intermittent Surveys: Where ongoing records from a MIS are not available due to worker illiteracy or the cost of regular communication, it is sometimes possible to institute a regular series of mini-surveys at specified intervals. This sometimes is more expensive but necessary where records do not exist or are of poor quality. Other surveys strategies may include: a before-and-after survey only; an annual survey; or, strategies that take advantage of other activities (e.g., “piggybacking” a questionnaire onto another survey).

Use of Sentinel Sites: Where distances are long or resources limited, it may be better to identify a few sites for ongoing monitoring. Regularly collecting data on breastfeeding practices from a sample of women from a small number of sites (sites of the most food insecure communities, for example) will help to reduce the scale of data collection and will lead to savings in terms of personnel, cost, and time. This approach will also enhance the depth of analysis and interpretation that is possible: it may be possible to account for the impact of other factors, and subtle differences between social and ethnic groups may be more readily apparent. Of course, if the sentinel sites are different from other communities, the findings might not apply to other groups covered by the program.

Exit Interviews: If a project is facility-based, exit interviews of clients carried out at set intervals may provide a great deal of information. A form such as that shown in Appendix 5, which is used in Honduras and referred to as MADLAC, can be used. The MADLAC (Monitoring of Support to Breastfeeding in Hospitals) form is administered monthly to a sample of mothers upon leaving the hospital, either after delivery or after a child health visit.

What Are the Steps Involved in Monitoring and Evaluation?

Self-assessment:

Before starting to select the indicators to measure your stated objectives, consider your starting position:

Why are you interested in monitoring and evaluating breastfeeding? Is this an area where your program needs bolstering, or are you including this objective for policy or other political reasons? The population from which the data must be gathered may be influenced by existing program target groups or mandate.

What information and data are already available? Is baseline information available? If so, the need to gather only follow-up data may be a less intensive approach than would changing the current MIS system.



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What data gathering mechanisms are available? Is there a well-established and functioning MIS? If so, modification of this instrument may be the most cost-effective approach. Is there ongoing survey work in the area? Again, a small addition to a functioning instrument may be an efficient strategy.

What are the relative costs, both fiscal and human resource, when comparing ongoing data gathering approaches to revised or new approaches?

Planning:

In deciding on monitoring breastfeeding promotion activities and practices, the program manager must answer the following questions:

1. What are the process and outcome objectives and what indicators will be used to assess each objective?
2. Who is the target group? For example, the target group may be first-time pregnant women, all pregnant women, or all women with a child less than two years old.
3. Are there existing data sources?
4. What combination of existing data and other data that can be collected using current resources will make up a workable monitoring system?
5. What resources do are available for collecting additional data (e.g., computers in the field, personnel available to carry out surveys)?

Box. 2.2 Example: Planning Monitoring Activities in Kenya

A program in Kenya has targeted mothers attending a clinic for prenatal care. Program staff wish to ensure that during the third trimester of pregnancy all mothers receive counseling about the importance of timely initiation (i.e. the importance of putting a newborn to the mother's breast within the first hour after birth).

Program staff have considered the questions above and determined:

1. A **process objective** might be: to provide counseling on breastfeeding at least once during the third trimester to 80% of pregnant women attending a clinic. Other process objectives may also be set: for example, to ensure that the trimester of visit is recorded on all prenatal records; to assess that counselors mark on the clinic record that counseling has occurred, etc.

An **outcome objective** might be: to increase the percent of mothers who put their newborn infants to the breast within an hour of birth (from 50% to 70%) among mothers who have received counseling.



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A **process indicator** might be: “the number of mothers in the third trimester of pregnancy who receive counseling out of the number of mothers in the third trimester who attend the clinic” (i.e. the percent of mothers in their third trimester who receive counseling).

An **outcome indicator** might be: “among mothers who have received counseling, the percentage who initiate breastfeeding (put the child to the breast) within one hour of birth.”

2. The target group includes all mothers coming to a clinic for prenatal care who are in their third trimester of pregnancy.

3. Existing data sources include individual records kept by the clinic, which contain information on the number of visits made, the services received, etc.

4. Strategy: a) Pull all the records or take a sample (such as every tenth record), enter the record number, the infant’s age, whether the infant was put to breast within one hour after birth into Epi Info or list the relevant data onto a sheet of paper in columns (i.e. compile existing data to determine the percent of third-trimester mothers who have received counseling); b) Calculate the percent who breastfed within one-half hour after birth; c) Develop an interview form (or questionnaire) for mothers who have been counseled; d) Utilize the local staff to conduct follow-up interviews with mothers to determine how soon after birth mothers put children to the breast.

5. Resources for the project include: a portable computer with Epi Info or paper and pencil to make calculations from the existing data records. Funds are also available to hire two local staff members to conduct interviews in the community.

Sample Size Considerations

In measuring process or outcome objectives, having a sufficient population size is crucial to achieving meaningful results. This often depends on resources available and on the level with which you wish to be able to have results considered to be representative. The sections that follow illustrate how the determination of sampling size can help you decide on the scope. The scope may also depend upon what information is already available (Demographic and Health Surveys (DHS), monthly health center statistics, sentinel site data, etc). The scope will also depend upon the data gathering mechanisms that area available, as well as the systems available to analyze the data and report back to the field.

Monitoring, per se, does not require a specific sample size. Assessment of changes, however, does require attention to the size of the comparison groups.

Studies or surveys are sometimes carried out as a component of program evaluation. Such studies are usually designed to estimate outcome indicators, e.g., breastfeeding practices in a community. Some studies are designed to assess certain aspects of program activities, e.g, the quality of care.



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Because such studies or surveys gather information from a sample of the population, the results may not be exactly the same as they actually are in the total community. Therefore, the results of the study or survey are said to be subject to *error*. Such error arises from two main sources: bias and sampling error. It is beyond the scope of this Tool Kit to discuss the various aspects of sampling design and sample size determination in detail. The effect that the type of sample design has on the findings, the so-called “design effect,” will also not be dealt with here. A helpful discussion of study design and sample size considerations can be found in Smith and Morrow 1991 (2).

Detailed survey manuals published by WHO describe the steps involved in conducting cluster sample surveys to estimate immunization coverage rates and to assess programs that aim to control diarrheal diseases and to manage respiratory illness among children (3, 4). Using this cluster sample methodology to assess vaccination coverage, information is collected for at least seven children aged 12 - <24 months in each of 30 geographic sampling points or clusters. It is important to have an up-to-date list for the population to be studied. This list should show the population size for each geographic subunit; it will be used as the basis for selecting the 30 clusters. Careful attention should be paid to the technique used in the selection of the respondents within each of the 30 clusters to avoid selection bias. A similar methodology can be used for assessing breastfeeding practices, although the sample size may need to be adjusted (see below).

Even if a completely representative and unbiased sample could be selected, the estimates of the indicators (e.g., the percent of children 12 - <16 months who are breastfed) would be subject to sampling error. For example, if 76% of children 12 - <16 months of age in the whole population are breastfed, a survey with such a representative sample could find, just by chance, that 82% of children in this age group are breastfed. Another survey, also with a representative sample selected using the same methodology and conducted at the same time, could find that 71% of the children are still breastfed.

The magnitude of the sampling error is reduced when the sample size is increased; i.e. when the sample size is adequate it is more likely that the true or population value of a given indicator is close to the value found by a survey. The so-called “confidence interval” of an estimate is smaller or narrower when the sample size is larger; that is, the value of an indicator in the population itself can be predicted with greater confidence from a survey with a larger (adequate) sample size than from one with a smaller (inadequate) sample size.

Program managers are often interested in finding out whether there has been a change after the introduction of a new program. Table 12 in Appendix 7 (reproduced from (5)) shows the sample sizes required for demonstrating various percentage point changes in the occurrence of a condition or indicator. As shown in the table, the sample size is dependent both on the magnitude of the change and on how common the condition or practice is. It is clear from this table that the detection of relatively small changes (five to ten percentage points) in breastfeeding rates requires large sample sizes. The sample sizes shown in the table can serve as a guide when designing studies or surveys for evaluation purposes.



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Sometimes percentages based on relatively small numbers are used as part of an evaluation process. As an empirical rule-of-thumb, percentages based on denominators of 25 to 49 should be interpreted with some caution. If the denominator is less than 25, it is usually best not to show the results as a percentage. For example, if a survey finds that 3 out of 17 children in Village A are breastfed compared to 1 out of 24 children in Village B, this may not represent a true difference between these two villages. If these findings were expressed as percentages, the breastfeeding rate in Village A would be calculated as 18% compared to only 4% in Village B.

When sample sizes are 50 or more, then percentages can be used, and comparisons easily made. However this means that you should have at least 50 children in each age group.³ Thus, if you want to disaggregate breastfeeding rates by one month intervals (<1 mo; 1 - <2 mo; 2 - <3 mo; and 3 - <4 mo), you will need 50 children in each of these age groups. If there are only 25 children at each age, then combine groups into age categories of <1 - <2 and 2 - <4.

To illustrate this point further, WHO conducted a cluster sample survey to assess use of child health services in six countries in which breastfeeding practices were measured. The smallest number of children in each one-month age group less than four months of age was about 70 children.

It is important to keep in mind that you can include questions on breastfeeding in any monitoring system or evaluation of other programs. You do not need a separate system or survey. However it will be important that you determine the sample size you will need for each of the variables that you want to accurately measure, and choose a sample size large enough to make all the statistical comparisons needed.

³ For many purposes 50 children in each age group would not be sufficient because you may want to break down your sample into additional comparison groups (for example, by sex, socioeconomic status or urban/rural residence).



CHAPTER THREE: SELECTING AND USING INDICATORS

The purpose of monitoring and evaluation is to allow managers to track progress in achieving program objectives. Therefore, indicators should be selected on the basis of the program objectives. Process indicators measure activities designed to produce desired outcomes. While the indicators can be either qualitative or quantitative, they should be easy to collect. The RHIWG Subcommittee on Breastfeeding has recently published a report that recommends indicators to measure breastfeeding promotion activities as well as breastfeeding practices. Indicators are defined for activities in the following areas: policy, quality of care, community-level counseling, training, family planning, and information, education, and communication (IEC). Where possible, we recommend that the definitions provided by the RHIWG be used (see Appendix 4). However, each project has unique characteristics that often require unique indicators for tracking program activities. It is most important with outcome indicators to use standard definitions wherever possible, so that comparisons can be made across programs and countries or over time. In addition to including such standard indicators, program-specific outcome indicators can, of course, also be included. Recommendations for selection of outcome indicators are discussed in the second half of this chapter.

Selecting your Indicators

Process Indicators

Wherever possible, process indicators should be reported as percentages or rates. For example, reporting the number of women counseled in the ante-natal clinic about good breastfeeding practices during their third trimester of pregnancy provides limited information. It does not necessarily indicate how close a program is to reaching all the women with breastfeeding promotion counseling. The findings can be reported as either a proportion (1/3) or as a percentage (33%). For process indicators where there is a relatively small number of activities planned, it does not make sense to report the findings as percentages. However, in such cases it is still helpful to report the number of activities carried out in relation to the objectives (e.g., number of training sessions conducted or completed in relation to the number of training sessions that were scheduled or planned).

Some activities do not have components that can be measured as a quantity, but they do have a completion date (e.g., development of forms for entry and follow-up). It is important that you attach a target date or some other specification (by when or before what date or other activity should this activity be completed) to this type of indicator.

Examples of process indicators are provided below. Indicators with an asterisk (*) are some of the indicators defined by the RHIWG in (1).



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Training process indicators may include:

- Curriculum development completed
- Trainings completed
- Providers (by cadre) trained in breastfeeding counseling*
- Trained providers who are knowledgeable (per objectives) in breastfeeding counseling*

IEC indicators may include:

- Focus groups completed
- Target breastfeeding communications products developed*
- Dissemination plan developed
- Dissemination plan activated
- Target breastfeeding communications products disseminated*
- Target audience exposed to IEC messages on breastfeeding*

Quality of Care indicators may include:

- Service providers trained to use family planning service delivery protocols for breastfeeding women*
- Service sites with trained personnel
- Service providers who ascertain whether or not a woman is breastfeeding prior to providing contraceptive advice or methods*
- Service sites achieving quality assurance parameters

Policy development indicators may include:

- Existence of national breastfeeding policy*
- Existence of national breastfeeding plan*
- Decision made by policy working group to change policy
- New policy implemented

Tracking your progress in developing and implementing monitoring and evaluation activities is recommended. Indicators may include:

- Identification of necessary technical assistance
- Completion of approved evaluation plan
- Development of the forms for entry and follow-up
- Completion of data collection
- Evaluation activities completed
- Feedback processes implemented

Process indicators will vary by the type of program. The following are a few examples of how the indicators might be modified depending on the program.

International Donors/National Policy Making Groups (Maternal and Child Health (MCH)/Family Planning (FP)/Economics/Labor/Education) may be interested in process indicators such as:

- Programs launched
- Plan of action for research project



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Maternities will also have special interests. The Baby-Friendly Hospital Initiative (BFHI) has provoked interest in the *Ten Steps to Successful Breastfeeding*. Thus, process indicators might be:

- Percentage of *Ten Steps* fully achieved
- Percentage of mothers with infants rooming in

Other hospital and clinic facilities might be interested in the percentage of their population that falls within the target group or the percentage of staff trained in breastfeeding support.

Health Programs would wish to know percentage of Expanded Promotion of Immunization (EPI), FP, and MCH service providers trained in breastfeeding and the lactational amenorrhea method (LAM) of contraception, or the percent of mothers with a child younger than three years and who have not had a subsequent pregnancy.

Other development-focused non-governmental organizations (NGOs) or grassroots/community organizations may establish a breastfeeding-related process objective, such as percentage of mothers referred for breastfeeding or LAM counseling.

Note: It is extremely important that your process indicators, when properly monitored and evaluated, relate to your outcomes. Therefore, it is generally logical to select your outcome objectives and measures in concert with the selection of your process measures. If the measurement of the indicators can be complementary or gathered at the same time or by the same instrument, that is an added bonus.

Outcome Indicators: Indicators of Breastfeeding Practices

Assessing breastfeeding “outcomes” involves measuring the breastfeeding behaviors or practices among members of the target population. Outcomes are sometimes measured to determine behavior change among mothers as a result of a given program or intervention. You may sometimes see outcomes referred to as “effects” or “impacts.” “Effects” are changes in the short- to medium-range (e.g., two to five years) in a behavior promoted by the program (e.g., change in the rate of exclusive breastfeeding, timely complementation). “Impacts” are changes that occur over the long-term in morbidity, mortality, fertility rates, nutritional status, etc. Measuring these impacts requires research methods and large sample sizes and therefore higher costs. Usually impact studies are prospective (with data collected on the same children over a specified time period).

In any study to assess the impact of breastfeeding practices on morbidity, there are several factors that can explain the results found (6). Most monitoring and evaluation systems are not able to control for all of the factors and thus assess impact with statistical assurance.

There may be an association between a specific breastfeeding practice and the child’s morbidity or nutritional status. This would be evident if a specific breastfeeding practice affected the child’s morbidity or nutritional status. However alternate explanations for this association could be:



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- 1) Increased morbidity /malnutrition changes the breastfeeding practice;
- 2) The breastfeeding practice is not associated with morbidity/nutritional status but is related to other confounding factors that are associated with morbidity/nutritional status;
- 3) A bias in: the selection of the children included in the survey; or in the classification in their breastfeeding status; or in the classification of their morbidity/nutritional status led to the observed association;
- 4) There is no association between the breastfeeding practice and morbidity/malnutrition; the observed association is due to sampling variation (i.e. by chance).

It is recommended that programs not spend their time and resources to attempt to look at changes in morbidity associated with changes in breastfeeding practices for these reasons.

Choice of Indicators

The program focus and specific circumstances in the community of interest will determine your choice of indicators. For example, it may be known from previous investigation or program experience that all mothers begin to breastfeed. However, many begin to add supplementary foods in the infant's early months and continue breastfeeding only for several additional months. In this instance, it would be appropriate to omit measurement of the "never breastfed rate." Instead, monitor the exclusive breastfeeding rate while addressing the problem of "too early supplementation" in the program activities. In addition, it would be useful to monitor progress in extending the duration of breastfeeding by measuring the rate of continued breastfeeding at twelve months. A brief rationale for measuring certain groups of indicators is outlined below.

Standard Indicator Definitions

Considerable work has gone into the development of indicators for the measurement of breastfeeding practices. The use of inconsistent definitions for the measurement of breastfeeding practices has resulted in contradictory conclusions about the prevalence of breastfeeding practices and their relationship to factors such as morbidity, mortality, and infant growth. To facilitate the collection of comparable data and information about breastfeeding, a number of groups have worked over many years to define and operationalize breastfeeding practice indicators.⁴ These definitions are now widely used.

⁴ Groups include USAID-funded groups (such as the Interagency Group for Action on Breastfeeding (IGAB)), WHO (Division of Diarrhoeal and Acute Respiratory Disease Control), UNICEF, DHS, and most recently the RHIWG Subcommittee on Breastfeeding.



The outcome indicators below are a subset of these indicators. It is recommended that these standard indicators for measuring breastfeeding practices be used so that data collected may be compared with that collected by other groups, and so that data you collect at different points in time may be compared. The definition of each indicator and, where appropriate, an illustrative calculation are found in Appendix 4. In Tables 1 and 2 we have indicated the questions that will allow collection of the data necessary to calculate each indicator.

The indicators are grouped by breastfeeding topic into six categories:

- Breastfeeding Rates
 - Exclusive Breastfeeding Rate (EBR)
 - Predominant Breastfeeding Rate (PBR)
 - Never Breastfed Rate
- Timely Initiation of Breastfeeding
 - Initiation of Breastfeeding in the First Hour of Life



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- Duration of Any Breastfeeding
 - Continued Breastfeeding Rate at 12 Months
 - Continued Breastfeeding Rate at 24 Months
 - Mean Duration of Breastfeeding
 - Median Duration of Breastfeeding
- Intensity of Breastfeeding
 - Frequency of Breastfeeding in 24 Hours
 - Full/Partial/Token Breastfeeding
 - Mean Duration of Lactational Amenorrhea
 - Median Duration of Lactational Amenorrhea
- Timely Complementary Feeding
 - Timely Complementary Feeding Rate
- Family Planning Use among Nursing Mothers
 - Appropriate Family Planning among Breastfeeding Mothers
 - Any Family Planning among Breastfeeding Women

Table 9 in Appendix 4 compares the definitions of commonly-used breastfeeding indicators.

Breastfeeding Rates

Indicator 1. Exclusive Breastfeeding Rate (EBR)

- 1a. Exclusive Breastfeeding Rate, 0 - <6 months
- 1b. Exclusive Breastfeeding Rate, months 0, 1, 2, 3, 4, and 5, by month

WHO recommends that infants be exclusively breastfed from birth to about six months of age. If infants were being breastfed according to this recommendation, all (100%) of infants would be breastfed from 0 - < 6 months (Indicator 1a).

However, the highest percentage of exclusive breastfeeding rate reported in any nationwide survey is about 60% (for Rwanda) and in many countries it is as low as 2% (e.g., Ghana). The exclusive breastfeeding rates for smaller age intervals among infants under six months of age (e.g., for one-month (such as <1 month or 1 - <2 months) or two-month age categories (such as 2 - <4 months)) may be examined to assess the changes in exclusive breastfeeding rates during this age interval. Using smaller age groups would, of course, require an adequate sample size in each of these age categories.

In its publication *Indicators for Assessing Breast-Feeding Practices* (7), WHO recommended the use of the indicator Exclusive Breastfeeding Rate for infants aged 0 - <4 months as a summary indicator of the status of breastfeeding in the population. The table in Appendix 6, published in UNICEF's *State of the World's Children 1995* (8), gives data on this indicator for most countries.

Indicator 2. Predominant Breastfeeding Rate (PBR)



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The predominant breastfeeding rate (PBR) illustrates the proportion of infants who are breastfed but who also receive water, water-based drinks (sweetened or flavored water, teas, infusions), fruit juice, or oral rehydration salts (ORS) solution. No other liquids or solids, i.e. no food-based liquids, are allowed. Infants who receive other milks are *not* predominantly breastfed.

Some programs have been able to increase the rate of predominant breastfeeding (by encouraging women to stop feeding milk to infants), but have been unable to change the exclusive breastfeeding rate because of the insistence by the culture that infants need water. Thus, collecting both rates is necessary, since a program may in fact have a major effect on predominant breastfeeding, but not on exclusive breastfeeding. The same age intervals are used for both the rate of exclusive and predominant breastfeeding.

Indicator 3. Never Breastfed Rate

This indicator shows the proportion of infants who never even begin to breastfeed. In most countries, this rate is usually quite low (1-2%); in some (e.g., Mexico), it is greater than 15% (see Table 11 in Appendix 6).

Timely Initiation of Breastfeeding

Indicator 4. Initiation of Breastfeeding in the First Hour of Life

Mothers are more likely to successfully initiate lactation, encounter fewer problems, and maintain breastfeeding for a longer period if the child remains with the mother and is put to the breast soon after delivery. Optimal practice is defined as putting the child to the breast within one hour of delivery. Early initiation of breastfeeding is beneficial to both mother and child. For the mother, breastfeeding immediately after delivery will facilitate placental expulsion and uterine contraction, reducing the risk of postpartum hemorrhage. Immediate initiation will help to establish milk flow and prevent breast engorgement. Early initiation is also critical to the infant. The early breastmilk, colostrum, is rich in nutrients and anti-infective agents, providing protection to the infant entering a world of pathogens.

Duration of Any Breastfeeding

Indicator 5. Continued Breastfeeding Rate

- 5a. Continued Breastfeeding Rate at 12 Months
- 5b. Continued Breastfeeding Rate at 24 Months

Indicator 6. Mean Duration of Breastfeeding

Indicator 7. Median Duration of Breastfeeding



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An essential component of optimal breastfeeding is that breastfeeding be sustained throughout the first two years of life. It is important that new foods given in the early months of the weaning period should truly complement and not replace breastfeeding. An infant's own immune defenses continue to mature until adult immune competence is achieved at around six years of age. Thus, the extra protection provided by the antibodies in breastmilk is especially important during this period when the infant begins to explore the wider environment and eat foods that are more likely to be subject to contamination. An extended period of substantial breastfeeding following six months of exclusive breastfeeding will ensure maximum immunological protection. Breastmilk also continues to be a significant source of both Vitamin A and protein during this time. Thus, breastmilk continues to be the safest and single most important food during the entire weaning period.

Tracking the duration of breastfeeding may be performed either to assess whether success in extending the duration of breastfeeding has been achieved (e.g., if breastfeeding is not generally continued throughout the first two years of life in the region) or to ascertain that breastfeeding duration is not decreasing (if breastfeeding duration tends to be long). To do this, measure one or more of the indicators of duration of breastfeeding: mean duration of breastfeeding or continued breastfeeding at 12 or 24 months. For evaluation purposes, the mean duration of breastfeeding is useful because it is easy to calculate. However, it is often possible to assess the median visually by looking at the results. Whether you choose to measure the mean or median will probably be determined by what data has been previously collected in your program or your area.

The indicators of continued breastfeeding at 12 or 24 months give the percent of children in a four-month window (12, 13, 14, and 15 months or 20, 21, 22, and 23 months) who are breastfeeding. If, for instance, most of the children in the program area have ceased to breastfeed by eight months, it will make sense to track progress in extending the duration of breastfeeding by measuring the percent who are still breastfed at 12 rather than 24 months. The ideal is to move all children toward sustained breastfeeding for the full 24 months.

Intensity of Breastfeeding

Intensity of breastfeeding is a measure to try to assess the amount of suckling that the infant does at the breast. More frequent and more intense suckling results in greater milk outputs and delayed onset of menses and subsequent pregnancy.

Indicator 8. Frequency of Breastfeeding in 24 Hours

Frequent feeding is especially important in early infancy. The young infant's stomach capacity is limited, and frequent suckling is necessary to meet the child's nutritional needs. Frequent suckling is critical for stimulating optimal milk production during the first one to two weeks of life when lactation is being established, and is necessary to ensure the maintenance of the mother's milk production throughout lactation. Frequent breastfeeding, with no long intervals between feeds, will also help to maximize the contraceptive effect of breastfeeding and protect the mother from closely-spaced pregnancies. (See Indicator 9, Appendix 4 for guidance on the frequency of breastfeeding)



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needed for contraceptive impact.) If an infant is breastfed three or fewer times per day, then the amount of breastmilk consumed is likely to be less than about 200 kcal per day (or less than 30% of the energy requirement of an infants <6 months, about 25% of the energy requirement of an infants 6-12 months, and 15% of the energy requirement of children aged one to three years) (9, 10).

Indicator 9. Full/Partial/Token Breastfeeding

To measure a breastfeeding pattern that has physiological implications, a schema for defining breastfeeding was developed and reviewed by more than 60 experts worldwide (11, 12) (for full schema, see Appendix 4, Full/Partial/Token Breastfeeding). This group concluded that two patterns of breastfeeding had similar impact in terms of maintenance of milk supply and maintenance of amenorrhea: "Full," including exclusive and almost exclusive breastfeeding, and "nearly full," including high partial. High partial is defined as more than 85% of all feeds are breastfeeds and a breastfeeding episode is never replaced with other food."

Indicator 10. Duration of Lactational Amenorrhea

- 10a. Mean Duration of Lactational Amenorrhea
- 10b. Median Duration of Lactational Amenorrhea

The mean duration of lactational amenorrhea is another means by which to assess the intensity of breastfeeding. It reflects both the maternal physiological response and the strength of the baby's sucking in maintaining the milk supply. In populations where lactational amenorrhea is extended (over eighteen months), breastfeeding intensity is quite high; in those where amenorrhea is quite short (two months), the intensity of breastfeeding is usually low.

Timely Complementary Feeding

Indicator 11. Timely Complementary Feeding Rate

After exclusively breastfeeding their infants for the first six months of life, mothers should add appropriate and adequate complementary foods while they continue to breastfeed. The complementary feeding rate indicator gives an overall measure of the degree to which women have complied with this recommendation for their infants aged 6 - <10 months. By this age, all infants should be receiving solid foods in addition to breastmilk.

Family Planning Use among Nursing Mothers

Indicator 12. Family Planning among Nursing Mothers

- 12a. Appropriate family planning among breastfeeding women
- 12b. Any family planning among breastfeeding women



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Another important indicator for breastfeeding women is whether they are using some form of protection from pregnancy. Since certain contraceptives are more appropriate than others for a breastfeeding woman (e.g., LAM for women meeting the three conditions, or progestin-only oral or injectable contraceptives), knowing the type of contraceptive used is important.

Asking Appropriate Questions

Once it is determined which children will be included in the sample and which indicators will be measured, it will be necessary to interview the mothers of those children to ask about feeding practices. WHO and other groups have conducted a great deal of research to ensure that questions on feeding practices produce valid and reliable results. Too often, the analyses of inappropriate questions have led to misunderstanding about the actual breastfeeding situation within a community.

Depending on your needs, there are different types of questions you may want to ask for monitoring or evaluation purposes. The best estimates of feeding patterns are obtained when “current” feeding practices are measured, using a 24-hour recall methodology.⁵ Respondents are asked whether an infant received any of a list of liquids and foods “since this time yesterday” (7) or “at any time yesterday or last night” (13).

Table 1 provides a list of appropriate questions that may be used to ask about feeding practices. It is not necessary to include all of these questions. However, including all of these questions will give you data on breastfeeding comparable to the DHS. Additional questions on types of local foods may be added. However, water, milk, and other liquids must be kept as separate categories.

Table 4 indicates the questions that must be asked for calculation of specific indicators. For example, to measure the “never breastfed rate”, you need only ask questions 1, 2, and 3 (date of interview, date of birth, and whether the child was ever breastfed).

Questions from Table 1 will provide data that will allow calculation of the following indicators:

- Exclusive Breastfeeding Rate (EBR)
- Predominant Breastfeeding Rate (PBR)
- Never Breastfed Rate
- Continued Breastfeeding Rate
- Mean Duration of Breastfeeding
- Median Duration of Breastfeeding

⁵ A second way in which breastfeeding behavior has been measured is the assessment of whether a child “ever received” other liquids or foods during a specified interval. Another way of measuring infant feeding behavior is to ask whether the infant “usually consumed” other liquids or foods during a specified interval.



- Mean/Median Duration of Lactational Amenorrhea
- Timely Complementary Feeding Rate

Table 2 contains questions about family planning. These questions will enable you to assess appropriate family planning usage among breastfeeding women.

Table 3 contains more specialized questions that you may want to include to evaluate the effect of specific interventions. For example, if your program is addressing timely initiation of breastfeeding, you will want to include question 11. By adding Tables 1, 2, and 3 together, you may assess women's eligibility for LAM.

This set of questions also includes more refined measures (for example a question on twins) that may not be necessary to assess your program. These questions will allow you to measure other indicators of breastfeeding intensity, including the frequency of breastfeeding and whether breastfeeding is full, partial, or token (see Appendix 4, D. Intensity of Breastfeeding).



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Table 1. Priority Questions for Breastfeeding Indicator Calculations

| Question Number | Question | Response |
|-----------------|---|---|
| 1. | Date of interview | __/__/__ mm dd yy ⁶ |
| 2. | Child's date of birth ⁷ | __/__/__ mm dd yy |
| 3 | Have you ever breastfed [NAME]? | 1 = NO. Skip to Question 5. 2 = YES. Continue below. |
| 4. | Since this time yesterday, have you breastfed [NAME]? | 1 = NO, 2 = YES |
| 5. | Since this time yesterday, has [NAME] received any of the following? ⁸ | |
| a. | Vitamins, mineral supplements, medicine | 1 = NO, 2 = YES |
| b. | Plain water | 1 = NO, 2 = YES |
| c. | Sweetened or flavored water | 1 = NO, 2 = YES |
| d. | Fruit juice | 1 = NO, 2 = YES |
| e. | Tea or infusions | 1 = NO, 2 = YES |
| f. | Infant formula | 1 = NO, 2 = YES |
| g. | Tinned, powdered or fresh milk | 1 = NO, 2 = YES |
| h. | Other liquids ⁹ | 1 = NO, 2 = YES |
| I. | Mushy or solid foods ¹⁰ | 1 = NO, 2 = YES |
| j. | Oral Rehydration Salts (ORS) solution | 1 = NO, 2 = YES |
| k. | Other (specify): _____ | 1 = NO, 2 = YES |
| 6. | Have your menses returned since the birth of [NAME]? | 1 = NO, 2 = YES |

⁶ Use appropriate locally used convention: mm/dd/yy (month/day/year) or dd/mm/yy (day/month/year)

⁷ Preferably from the birth registry or other record

⁸ List of liquids and foods to be developed locally and revised based on the pre-test. This list should include common weaning foods.

⁹ Includes broths and clear soups

¹⁰ Includes cereal, porridge, thick soups, or stews



| | | |
|----|---|---|
| 7. | Any other children in the target age range? | 1 = NO. End Interview. 2 = YES: If mother has another child in target age range, repeat questions 1-6 for the older child. |
|----|---|---|



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Table 2. Questions for Family Planning Indicator Calculations

| Question Number | Question | Response |
|-----------------|--|-------------------------------|
| 8. a. | Are you now pregnant? | 1 = NO, 2 = YES |
| b. | Are you trying to get pregnant? | 1 = NO, 2 = YES |
| 9. | Are you currently doing something or using some method to delay or avoid pregnancy | NO: Finished YES: GO to 10 |
| 10. | Which method(s) are you using? ¹¹ | |
| a. | IUD | 1 = NO, 2 = YES |
| b. | Tubal ligation (female sterilization) | 1 = NO, 2 = YES |
| c. | Vasectomy (male sterilization) | 1 = NO, 2 = YES |
| d. | Condom | 1 = NO, 2 = YES |
| e. | Vaginal barrier methods (diaphragm/foam/jelly/spermicide) | 1 = NO, 2 = YES |
| f. | Combined hormonal injectables | 1 = NO, 2 = YES |
| g. | Progestin-only hormonal injectable (e.g., Depo-Provera) | 1 = NO, 2 = YES |
| h. | Subdermal implant: NORPLANT | 1 = NO, 2 = YES |
| I. | Combined oral contraceptives | 1 = NO, 2 = YES |
| j. | Progestin-only oral contraceptive | 1 = NO, 2 = YES |
| k. | Withdrawal | 1 = NO, 2 = YES |
| l. | Periodic abstinence: ovulation method | 1 = NO, 2 = YES |
| m. | Periodic abstinence: sympto-thermal method | 1 = NO, 2 = YES |
| n. | Periodic abstinence: calendar | 1 = NO, 2 = YES |
| o. | Lactational Amenorrhea Method ¹² | 1 = NO, 2 = YES |
| p. | Other breastfeeding | 1 = NO, 2 = YES |
| q. | Other method, specify | 1 = NO, 2 = YES |

¹¹ Method codes to be developed locally and revised based on a pre-test. However, large categories must be maintained.

¹² A mother must have selected to actively use LAM to be considered a LAM acceptor. Appendix 8, which contains the LAM Algorithm, provides guidance for identifying LAM users for Health Information System purposes.





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Table 3. Specialized Questions for Breastfeeding Indicator Calculations

| Question Number | Question | Response |
|-----------------|--|--|
| 11. | How long after birth did you first put [NAME] to the breast? | _____ Immediately Hours <input type="text"/> Days <input type="text"/> If less than 1 hour, record 00 hours. If less than 24 hours, record hours. Otherwise, record days. |
| 12. a. | How many times did you breastfeed last night between sunset and sunrise? ¹³ | times <input type="text"/> |
| b. | How many times did you breastfeed yesterday during the daylight hours? | times <input type="text"/> <input type="text"/> |
| 13. | Since this time yesterday, has [NAME] received any of the following? ¹⁴ | |
| a. | Vitamins, mineral supplements, medicine | times <input type="text"/> <input type="text"/> |
| b. | Plain water | times |

¹³ Piwoz et al. used data on the number of daily breastfeeds to rank a group of Peruvian infants and classify the intensity of breastfeeding as follows: The lowest fifth percentile were classified as “token breastfeeders” and were breastfed 1-3 times/day (with an average breastmilk intake of 182 kcal/d). “Low intensity breastfeeders” (5-25th percentile) were breastfed 4-6 times/d (average breastmilk intake of 337 kcal/d), “medium intensity breastfeeders” (25-75th percentile) were breastfed 7-9 times/d (average breastmilk intake of 405 kcal/d) and “high intensity breastfeeders” (>75th percentile) were breastfed >9 times/d (average milk intake of 428 kcal/d). The proportion of total energy intake from breastmilk was in a similar direction: 30% for token, 58% for low, 73% for medium and 77% for high intensity breastfeeders (9).

¹⁴ List of liquids and foods to be developed locally and revised based on the pre-test. This list should include common weaning foods.



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| | | |
|----|------------------------------------|---|
| | | <input type="text"/> |
| | | <input type="text"/> |
| c. | Sweetened or flavored water | times <input type="text"/> <input type="text"/> |
| d. | Fruit juice | times <input type="text"/> <input type="text"/> |
| e. | Tea or infusions | times <input type="text"/> <input type="text"/> |
| f. | Infant formula | times <input type="text"/> <input type="text"/> |
| g. | Tinned, powdered or fresh milk | times <input type="text"/> <input type="text"/> |
| h. | Other liquids ¹⁵ | times <input type="text"/> <input type="text"/> |
| i. | Mushy or solid foods ¹⁶ | times |

¹⁵ Includes broths and clear soups

¹⁶ Includes cereal, porridge, thick soups, or stews



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| | | |
|-----|--|---|
| | | <input type="text"/> |
| | | <input type="text"/> |
| j. | Oral Rehydration Salts (ORS) solution | times <input type="text"/> <input type="text"/> |
| k. | Other (specify): _____ | times <input type="text"/> <input type="text"/> |
| 14. | a. Did [NAME] drink anything from a bottle with a nipple yesterday or last night | 1 = NO, 2 = YES |
| | b. If yes, please describe: _____ | |
| 15. | Single or multiple birth? ¹⁷ | 1 = Single 2 = Multiple |

¹⁷ In populations where the rate of twinning is high (e.g., over 5% in Nigeria), information on *births* is needed to calculate the indicator “mean duration of lactational amenorrhea.” For this indicator, the denominator is “births” rather than “children.” The difference is that twins count as one birth but two children. See Indicator 10a, Appendix 3, for further explanation.



Table 4. Numbers for Questions Needed for Data Collection¹⁸

| Indicators | Numbers for questions needed to calculate age¹⁹ | Numbers for questions needed to calculate indicator (from Tables 1-3) |
|--|---|--|
| Breastfeeding Rates | | |
| 1. Exclusive Breastfeeding Rate | 1, 2 | 4, 5 (a-k) |
| 1a. Exclusive Breastfeeding Rate, 0 - <6 Months | 1, 2 | 4, 5 (a-k) |
| 1b. Exclusive Breastfeeding Rate, months 0, 1, 2, 3, | 1, 2 | 4, 5 (a-k) |
| 2. Predominant Breastfeeding Rate | 1, 2 | 4, 5 (a-k) |
| 3. Never Breastfed Rate | 1, 2 | 3 |
| Timely Initiation of Breastfeeding | | |
| 4. Initiation of Breastfeeding in the First Hour of Life | 1, 2 | 11 |
| Duration of Any Breastfeeding | | |
| 5. Continued Breastfeeding Rate | 1, 2 | 4 |
| 5a. Continued Breastfeeding at 12 Months | 1, 2 | 4 |
| 5b. Continued Breastfeeding at 24 Months | 1, 2 | 4 |
| 6. Mean Duration of Breastfeeding | 1, 2 | 4 |
| 7. Median Duration of Breastfeeding | 1, 2 | 4 |
| Intensity of Breastfeeding | | |
| 8. Frequency of Breastfeeding in 24 Hours | 1, 2 | 12a, 12b |
| 9. Full/Partial/Token Breastfeeding | 1, 2 | 4, 5 (a-k), 12a, 12b |
| 10a. Mean Duration of Lactational Amenorrhea | 1, 2 | 6, 7, 8 ²⁰ |
| 10b. Median Duration of Lactational Amenorrhea | 1, 2 | 6, 7, 8 ²¹ |
| Timely Complementary Feeding Rate | | |
| 11. Timely Complementary Feeding Rate | 1, 2 | 4, 5 (a-k) |
| Family Planning Use among Nursing Mothers | | |

¹⁸ Numbers refer to questions in Tables 1-3.

¹⁹ See Appendix 2 for help in calculating age.

²⁰ For children whose mothers have experienced a subsequent pregnancy, the answer to Question 6, "Have your menses returned?" should always be considered 'YES.'

²¹ For children whose mothers have experienced a subsequent pregnancy, the answer to Question 6, "Have your menses returned?" should always be considered 'YES.'



| | | |
|--|------|----------------------------------|
| 12a. Appropriate Family Planning among Nursing Mothers | 1, 2 | 6, 8a, 8b, 9, 10 (a-q), 12a, 12b |
| 12b. Any Family Planning among Nursing Mothers | 1, 2 | 6, 8a, 8b, 9 |



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Other Questions

While we believe that these indicators are the most appropriate and easiest to collect, some program managers may want to include additional questions.

“Ever” Consumption of Liquids or Solids

One such question asks whether an infant has “**ever** received” other foods or liquids since birth. The response to this question, however, is somewhat difficult to interpret. The response of a mother who gave her infant a bottle of water or milk only once will be the same as that of a mother who gives bottles daily. However, this question does illustrate the strictest definition of “exclusive breastfeeding.” If you decide to ask this question, you should **also** always ask the questions shown in Table 1, as these will provide data more useful for monitoring purposes since they provide consistent results, whereas the “ever” question does not.

Another issue to keep in mind is that it is **not** appropriate to ask the age at which other foods or liquids were **first** given to an infant. The reason is that the analyses of such data necessitate the use of sophisticated analytical techniques (e.g., life tables) that require special computer programs and are extremely difficult to do. Special techniques are needed when information is collected on **when** events occurred (e.g., when water was introduced) unless everyone interviewed has experienced that event (e.g., has already consumed water).

Too often the average duration of time to “first water use” or “first milk consumption” is calculated incorrectly. This is because those infants who have not yet consumed water or milk can not be included in the calculation of the average. By definition, the average duration is always biased to be shorter than the actual average.

Thus if you decide to ask about “ever” use, it is best to ask the question with a ‘yes’ or ‘no’ response rather than when liquids were first introduced. It is also best to use the same responses shown in Table 1, (water, milk, herbal teas, etc) but with the question “Has your child ever received any of the following....”

Pre-lacteal Feeds

In areas where the use of pre-lacteal feeds is common, you may want to ask about their use. Pre-lacteal feeds are liquids often given until the mothers milk “comes in.” Infants should not receive these liquids as they can be a source of contaminants and they can interfere with breastmilk output. To determine what liquids to ask about, you should talk to new mothers (for example, in focus groups or through questioning a sample of mothers in your area) to learn about the most common liquids given. These may include honey, water, cow’s milk, herbal teas, etc. A question that has often been asked is “Did you give your infant any liquids or foods other than breastmilk in the first



few days of life?” or “Did you give your infant any other liquids or foods before your milk ‘came-in’?”

Questions Not to Ask

There are other questions that are not appropriate to ask because their results do not give consistent responses. For example, “Are you feeding your child _____ (water, milk)?” can mean different things to different people. If you want to ask about consumption of foods or liquids, it is best to do so for a specific time period (for the previous day as suggested in Table 1), or within the last week or two weeks (“Did you give your child _____ during the last week?”).²²

It is also never appropriate to mix two questions in one. For example, never ask “How long do you plan to breastfeed or if you have already stopped, how long did you breastfeed?”. Such questions give answers that can not be used, since one is based on an opinion about the future while the other is based on past experience.

²² For research purposes, especially in qualitative studies, different questions can be used. In research in Peru, for example, mothers were asked whether their infants consumed non-human milks, other liquids and any of a list of locally available solid foods two or more times/per week on average during the preceding month. Such a question is better able to define “normal consumption” than a general question of “Are you feeding your child _____?” (14)





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CHAPTER FOUR: AVOIDING PITFALLS

This chapter discusses some of the pitfalls to avoid when collecting data in a monitoring system or for an evaluation and when analysing data on breastfeeding practices. Some of the issues discussed are more relevant to evaluations where a greater degree of accuracy in measurement is often obtained. But a program manager will want to understand these issues even if they do not relate specifically to the monitoring of a program.

Designing the Program and the Monitoring/Evaluation System

Setting Appropriate Goals

To set goals for your program you need to decide on what you expect to achieve. How much change should a program aim for in the next “x” years? A recent, intensive research project in Mexico observed substantial improvements in rates of exclusive breastfeeding among infants at three months of age when mothers received home visits from a trained peer counselor. Seven percent of the control mothers exclusively breastfed at three months, compared with 33% and 48% of the mothers visited by the peer counselors three times and six times, respectively. A program could achieve something less than this and still be considered quite successful. It is unlikely for a program to have a greater effect than this within only a few years.

Selecting the Questions

In Chapter Three, we discussed the different indicators that you might want to choose for your monitoring or evaluation system. Once you choose these, you should take care if you later decide to change the questions included in your system. Too often a new staff person may decide on alternate questions after previous ones have already been included in the system. If new questions are added and the old ones also retained, this may still allow comparisons to the old indicators. But at times the inclusion of new questions may cause mothers to answer old ones differently than in the previous survey. So if new questions are added, it is essential to pre-test and analyse the responses to assess whether they caused biased responses in other questions.

Data Collection

Training of Staff

Too often neither the supervisors nor the community-level staff are sufficiently trained on the importance of and how to gather data or use the appropriate forms. If supervisors are not able to support the data collection system and ensure that the data are accurate, then the system often



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produces useless information. Monitoring of activities should assess the understanding of workers about the monitoring forms and spot check the information on the forms.

Choice of Survey Subjects

Selection of the survey population will have important implications for the calculation of the breastfeeding indicator. Specifically, information should be obtained on all children in the family within the specified age range. For example, if there are two children in the family who are less than 24 months of age, the feeding practices of both children should be assessed.

If only last-born children are included in the survey, the findings may be biased, and the bias may not be equal in all countries or among all population subgroups. Last births are not a representative sample of all births. Last-born children may have a greater chance of experiencing prolonged breastfeeding, for example. The sample of children for whom an indicator is calculated should always refer to all children born during a specified time period to be representative of the population of children. This means that information will also be collected on children within that age range who were never put to the breast, i.e. “never breastfed.” The issues highlighted below are discussed in greater detail in a paper by Sommerfelt et al. (14).

Categorical Data

Whenever possible, data should be captured as continuous numbers. The capture of data in categories results in the loss of information and should only be done when the loss of information is compensated for by a significant increase in the ease of administration, return rates, or other benefits.

This issue is relevant, for example, for calculation of the indicators “frequency of breastfeeding in 24 hours” and “initiation of breastfeeding in the first hour of life.” When asking the question “How long after birth did you first put [NAME] to the breast?” we recommend that the response data be captured in hours (<1, 1, 2, 3, etc.) rather than in categories such as <1 hr, 1-8 hr, 8-24 hrs, etc. Doing so will allow the flexibility to recode the data in different ways during the data analysis.

Data Analyses

Calculated vs. Reported Age

The appropriateness of infant feeding practices is closely linked to the age of the child. Therefore, the assessment of feeding practices is dependent upon accurate determination of the child's age. Data on trends in the prevalence of feeding behaviors also cannot be trusted if there is not consistent accuracy in the reporting of “age” over time (the same is true for trends in the prevalence of undernutrition).

Age is most accurately determined from a calculation, subtracting the birth date from the interview date. Use of completed age is recommended; therefore, a child who is one month and 25 days old is still considered one month old. However when mothers report age, they may round up. For example,



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if the child is one month and 25 days old, they may be more likely to say that the child is two months old. Thus, calculated age will differ from reported age.

There is likely to be “heaping” of data at monthly or six-month intervals. Therefore, when at all possible, infant feeding practices should be assessed using calculated age. It is important that interviewers learn how to obtain the correct birth date. If computers are used for data entry and tabulation, the child’s age should be calculated by the computer to avoid mistakes that will occur if hand calculation is done.

Comparing Two Groups: Breastfeeding Rates

We often want to compare breastfeeding rates for two groups of infants. For example, we may wish to compare infants from the same population, measured at different points in time (e.g., at the beginning of a program and a year later), or we may wish to compare infants at the same point in time from two different populations (e.g., from two different geographic areas).

This poses no problem if sampling yields the same distribution of infants across the different age categories (i.e. a similar distribution of infants in age 0, 1, 2, 3, 4, 5 months in Groups A and B). However, the age distribution of infants in the two groups may differ. This difference in distributions will affect the overall breastfeeding rates when an indicator, such as exclusive breastfeeding rate for infants 0 - <6 months, is calculated. This is because breastfeeding behavior is linked to infant age. As infants grow older, fewer are generally exclusively breastfed.

For example, in Table 5 below, the proportions of infants exclusively breastfed in each age category for Groups A and B are exactly the same (see Column 4). However, the distribution of infants over the six age categories is quite different in Groups A and B (see Column 2). The greater number of infants in the younger age categories in Group A is responsible for the higher overall rate of exclusive breastfeeding for infants 0 - <6 months in Group A than in Group B (68% vs. 60%). The Group A rate has been disproportionately influenced by the larger numbers of infants in the lower age categories.

Therefore, when comparing the breastfeeding rates of two groups of infants, care must be taken to examine the distribution of infants across the different age categories. This has two important implications:

- *Programmatic implications:* A program may appear more or less effective depending on the distribution of infants across age categories in the program and non-program samples.
- *Reporting implications:* When comparing program results to the baseline rates provided by regional, national, or international surveys, the distribution of age categories must be similar to those of the sample on which the other statistics are based. Otherwise, the program results can not be reliably compared.



Table 5. Data Illustrating the Importance of Age Distribution²³

| Group A | | | |
|---|-------------------------------|---|---|
| Age in completed months Column 1 | Number of infants Column 2 | Number exclusively breastfed Column 3 | Proportion exclusively breastfed Column 4 |
| 0 mo | 80 | 64 | 80% |
| 1 mo | 75 | 53 | 70% |
| 2 mo | 70 | 46 | 66% |
| 3 mo | 50 | 29 | 58% |
| 4 mo | 14 | 7 | 50% |
| 5 mo | 11 | 4 | 36% |
| Total | 300 | | |
| Overall rate of EBF, 0 - <6 months: 203/300 = 68% | | | |
| Group B | | | |
| Age in completed months Column 1 | Number of infants Column 2 | Number exclusively breastfed Column 3 | Proportion exclusively breastfed Column 4 |
| 0 mo | 50 | 40 | 80% |
| 1 mo | 50 | 35 | 70% |
| 2 mo | 50 | 33 | 66% |

²³ Table 5 is shown for illustrative purposes only. It is extremely unlikely that an actual survey would result in age distributions such as those shown for Groups A and B. In a real-life situation, a sample of infants under six months of age would practically never have such a skewed and unequal distribution as that seen for Group A, nor such an even distribution as that shown for Group B. However, unequal distributions that can affect breastfeeding rates are not uncommon when there are small numbers in each age group. If Group A was from an actual survey, this age distribution would suggest a biased sample, i.e. that younger children were more likely to be included in the survey. It is virtually impossible to find that same number of children in each one-month age group as shown for Group B.

Observing percent exclusively breastfeeding alone may not give an adequate reflection of changes in breastfeeding patterns and programmatic successes may be missed. If programmatic impact is to be observed, recording increases in partial (especially high partial) is also of interest. See Appendix 9 below.



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| | | | |
|--|-----|----|-----|
| 3 mo | 50 | 29 | 58% |
| 4 mo | 50 | 25 | 50% |
| 5 mo | 50 | 18 | 36% |
| Total | 300 | | |
| Overall rate of EBF, 0 - <6 months: $180/300 = 60\%$ | | | |

Breastfeeding Duration: Calculating the Denominator

A common mistake made in analyzing breastfeeding rates occurs when data are collected on the duration of breastfeeding. The average age at which breastfeeding is stopped (mean or median duration of breastfeeding) should be calculated from data on breastfeeding practices reported for the day preceding the survey. The denominator should include data on all infants born during the specified time period, both those who have stopped breastfeeding and those who continued to breastfeed. Never calculate these indicators using data from a sample based only on women who have stopped breastfeeding. This mistake always makes the estimate of duration of breastfeeding too low because women who are still breastfeeding and who will stop at later postpartum durations are not included.

Age Periods for Indicators

The indicators that show the prevalence of feeding practices at specific ages are constructed to measure breastfeeding behavior of infants within a certain age group or a “period window” (e.g., the percentage of infants 0 - <6 months who are exclusively breastfed). These indicators reflect the average percentage of infants who are fed according to the recommendations. They do not, however, show what proportion of infants are exclusively breastfed at months 1, 2, 3, etc. A breastfeeding rate of 30% for infants 0 - <6 months means that infants are clearly not fed according to recommendations. However, it does not tell us exactly what the age pattern of exclusive breastfeeding is.

When data on practices by months (i.e. for a “single-month window”) are required, there is need for larger sample sizes to obtain a reliable estimate. With a small sample size, random fluctuations in the prevalence levels with “single month window” estimates make one less confident of the accuracy of the estimates, and reduce the ability to detect changes over time or differences between population groups.

An alternative that would minimize the sampling variation due to small sample sizes for single months would be to look at infants for two-month periods (e.g., an “extended window” of two to three months). This would result in an indicator based on more cases, and hence yield a more stable estimate, while retaining the advantage of being able to focus on a particular period of time.



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However, as illustrated above, it is important that there be similar numbers of children in each age category if comparisons are to be made between groups. The use of an unbiased sampling approach will ensure that there are similar numbers of children in each age category and that selection bias does not occur.



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APPENDIX 1: WHERE TO SEEK HELP

Below is a list of organizations that could provide more information on monitoring and evaluation of breastfeeding practices and programs or provide assistance in identifying appropriate breastfeeding professionals.

Demographic and Health Surveys (DHS)

Macro International Inc.

11785 Beltsville Drive, Suite 300
Calverton, MD 20705-3121
Phone: (301) 572 0200
Fax: (301) 572 0999

United Nations Children's Fund (UNICEF)

Nutrition Section
3 UN Plaza
New York, NY 10017, USA
Phone: (212) 326 7742
Fax: (212) 755 1449

International Baby Food Action Network (IBFAN)

Geneva Infant Feeding Association
P.O. Box 157
1211 Geneva 19, Switzerland
Phone: (41 22) 798 91 64

Wellstart International

4062 First Avenue
San Diego, CA 92103-2045
Phone: (619) 295 5192
Fax: (619) 294 7787

International Lactation Consultant Association (ILCA)

201 Brown Avenue
Evanston, IL 60202-3601, USA
Phone: (708) 260 8874
Fax: (708) 475 2523

World Alliance for Breastfeeding Action (WABA)

P.O. Box 19, 10700
Penang, Malaysia
Phone: (60 4) 656 9799
Fax: (60 4) 657 7291

Institute for Reproductive Health (IRH)

Georgetown University Medical Center
2115 Wisconsin Avenue, NW, Suite 602
Washington, DC 20007
Phone: (202) 687 6846
Fax: (202) 687 1392

World Health Organization (WHO)

Control of Diarrhoeal and Respiratory Diseases Unit
1211 Geneva 27
Switzerland
Phone: (41 22) 791 2633
Fax: (41 22) 791 2726

La Leche League International (LLL)

Center for Breastfeeding Information
Schaumburg, IL 60173, USA
Phone: (708) 519 7750
Fax: (708) 519 0125



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APPENDIX 2: CALCULATING AGE

The age data needed to calculate the recommended indicators are data on infant age in “completed months.” To determine the number of days to be included in each monthly category in Table 6, the 365 days in one year have been divided into twelve equal parts. For example, an infant aged one to 30 days has not yet completed one month, so is classified as less than one month or zero completed months old. Infants aged 31- 61 days (or less than 62 days old) are classified as one completed month old. Table 6 presents infant age in completed months and the corresponding age in days.

It is preferable to calculate infant age by subtracting the infant's date of birth from the date of the interview. When dates of birth are not known, the age as given by the mother can be used. “Age in days” may be determined in one of three ways:

Calculating Age by Hand

If doing calculations by hand, find or make a calendar that includes the dates from the birth date of the oldest child in the study to the last interview date. Using the calendar, determine the infant's age from the date of birth and date of interview. Alternatively, use the following calculations.



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Example 1.

1. Put the age into a format “year/month/day.” Example: 96/12/24
2. Subtract the two dates: put the larger date (date of interview) on the top; place the date of birth under the date of interview.
3. Begin with the “days” column on the far right. Subtract the 12 from the 24 days and record the difference in the “age - days” column.
4. In the “months” column, subtract the 6 from the 12, and record the difference in the “age - months” column.
5. In the “years” column, subtract the 95 from the 96, and record the difference in the “age - years” column.
6. Calculate the child’s age by converting the “years” and “months” columns to “days”. Add the total number of days to determine the child’s age in days.

| | |
|--------------------------|---------------------------------------|
| Example: | year/month/day |
| Date of interview: | 96/12/24 |
| Date of birth: | <u>95/06/12</u> |
| Age (years/months/days): | 01/06/12 |
| | |
| The child is: | 1 yr = 365 days |
| | + 6 mo = 180 days (6*30) ¹ |
| | + 12 days = <u>12 days</u> |
| | 557 days |

Example 2.

Example 2 shows that hand calculations are sometimes a little more difficult, but still possible. In this example it is necessary to “borrow from the ‘months’ and ‘years’ columns.”

1. Because 25 is larger than 13, you must borrow 30 days (1 month) from the “months” column.
2. Because there are 0 months in the “months” column from which you want to subtract 11 months, you must borrow 12 months (1 year) from the “years” column.
3. Now subtract 25 days from the 43 days (30 + 13) and 11 months from 12 months.

¹ The use of 30 days per months (rather than 30.4 days - i.e., 365 days/year ÷ 12 months = 30.4 days/month) will result in a slight difference in the child’s age (approximately two days over a six-month period) when compared to age calculated by computer from date of interview and date of birth.



4. Record the differences in the appropriate columns as in Example 1.
5. The month is converted to 30 days and added to the days (18) to determine the child's total age in days.

| Example: | year/month/day | year/month/day | year/month/day |
|--------------------------|-----------------|-----------------|-----------------|
| | | 96/00/30+13 | 95/12/43 |
| Date of interview | 96/01/13 | 96/01/13 | 96/01/13 |
| Date of birth | <u>95/11/25</u> | <u>95/11/25</u> | <u>95/11/25</u> |
| Age (years/months/days): | | | 00/01/18 |
| The child is: | 1 month = | 30 days | |
| | + 18 days = | <u>18 days</u> | |
| | | 48 days old | |

Calculation of Age in Epi Info

To calculate an infant's age in Epi Info, it is first necessary to create a new variable, which will be the child's age in days, and then calculate the age in days from the date of interview and date of birth. Dates of birth and interview need to be in the same format, such as dd/mm/yy or mm/dd/yy and must be defined in Epi Info as dates (rather than numbers of string variables):

Define Kiddays ##### This defines a new number variable.

Kiddays = (Date of interview) - (Date of birth)

This calculation should give the child's age in days. If the resulting number is negative, then check the dates to make sure they are correct. The same is true if the resulting number of days is outside the expected age range of the children in the study.

Calculation of Age using SPSS for Windows

If doing data analysis in SPSS: From the TRANSFORM menu, choose COMPUTE. Give the new TARGET VARIABLE a name such as "age" or "age_days." From the FUNCTION list, choose CTIME.DAYS (timevalue) and enter it into the NUMERIC EXPRESSION box. The final expression should look as follows:



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| Target Variable | Numeric Expression |
|-----------------|--|
| Age | $= \text{CTIME.DAYS (variable name for interview date)} - \text{CTIME.DAYS (variable name for infant's birth date)}$ |

This transformation will give the infant age in days. Use Table 6 to convert infant age in days to age in completed months, either with a computer program or by hand.



Table 6: Infant Age Conversion Chart

| Age in Completed Months | Days | Breastfeeding Indicators related to Age |
|-------------------------|--------------|--|
| < 1 month | 0-30 days | Exclusive Breastfeeding Rate (EBR) Predominant Breastfeeding Rate (PBR) Full/Partial/Token Breastfeeding |
| 1 month | 31-61 days | |
| 2 months | 62-91 days | |
| 3 months | 92-122 days | |
| 4 months | 123-152 days | |
| 5 months | 153-182 days | |
| 6 months | 183-213 days | Timely Complementary Feeding Rate |
| 7 months | 214-243 days | |
| 8 months | 244-274 days | |
| 9 months | 275-304 days | |
| 10 months | 305-335 days | |
| 11 months | 336-365 days | |
| 12 months | 366-395 days | Continued Breastfeeding at 12 Months |
| 13 months | 396-426 days | |
| 14 months | 427-456 days | |
| 15 months | 457-487 days | |
| 16 months | 488-517 days | |
| 17 months | 518-547 days | |
| 18 months | 548-578 days | |
| 19 months | 579-608 days | |
| 20 months | 609-639 days | Continued Breastfeeding at 24 Months |
| 21 months | 640-669 days | |
| 22 months | 670-700 days | |
| 23 months | 701-730 days | |
| 24 months | 731-760 days | |
| 25 months | 761-791 days | |
| 26 months | 792-821 days | |
| 27 months | 822-852 days | |



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| | | |
|-----------|----------------|--|
| 28 months | 853-882 days | |
| 29 months | 883-913 days | |
| 30 months | 914-943 days | |
| 31 months | 944-973 days | |
| 32 months | 974-1004 days | |
| 33 months | 1005-1034 days | |
| 34 months | 1035-1065 days | |
| 35 months | 1066-1095 days | |
| 36 months | 1096-1125 days | |
| 37 months | 1126-1156 days | |
| 38 months | 1157-1186 days | |
| 39 months | 1187-1217 days | |
| 40 months | 1218-1247 days | |
| 41 months | 1248-1278 days | |
| 42 months | 1278-1308 days | |
| 43 months | 1309-1338 days | |
| 44 months | 1339-1369 days | |
| 45 months | 1370-1399 days | |
| 46 months | 1400-1430 days | |
| 47 months | 1431-1460 days | |
| 48 months | 1461-1490 days | |
| 49 months | 1491-1521 days | |
| 50 months | 1522-1551 days | |
| 51 months | 1552-1582 days | |
| 52 months | 1583-1612 days | |
| 53 months | 1613-1643 days | |
| 54 months | 1644-1673 days | |
| 55 months | 1674-1703 days | |
| 56 months | 1704-1734 days | |
| 57 months | 1735-1764 days | |
| 58 months | 1765-1795 days | |
| 59 months | 1796-1825 days | |



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| | | |
|-----------|----------------|--|
| 60 months | 1826-1855 days | |
|-----------|----------------|--|

Age in Days for Calculation of the WHO Breastfeeding Indicators in (6):

Infants <4 months of age are 0 - <120 days old

Infants from 6 - 9 months (6 - <10 months) are 180 - 299 days old



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APPENDIX 3: TABLES CONTAINING DATA FOR USE IN ILLUSTRATIVE COMPUTATIONS

Calculating Breastfeeding Rates by Hand

Data may be analyzed “by hand” or using a computer. If you wish to analyze your data by hand, the first data analysis step is to create a table which sorts the data by infant age and infant feeding pattern. For example, in Table 7 the total number of infants aged 0 - <6 months is 305. The number of infants in each age group who were “not breastfed” is recorded in column 3 and the number who received breastmilk, water, and nothing else is recorded in column 6. Sorting data as in Tables 7 and 8 will enable the calculation of a number of indicators. These calculations are illustrated in Appendix 4.

| Table 7: 24-hour recall data for infants 0 - <6 months | | | | | | | | |
|--|----------------------|-------------------|-----------------------------|--|---------------------------------------|---|---|---|
| Number of infants receiving food types | | | | | | | | |
| Age of Infant | Total No. of infants | No. not breastfed | No. receive only breastmilk | No. receive only breastmilk and vitamins | No. receive only breastmilk and water | No. receive only breastmilk, water, and juice | No. receive only breastmilk, formula or other milks, juices (no solids) | No. receive breastmilk with solids (allows any other liquids, milks or formula) |
| 0-30 days (< 1 mo) | 50 | 2 | 16 | 2 | 7 | 12 | 8 | 3 |
| 31-61 days (1 mo) | 49 | 5 | 12 | 2 | 8 | 9 | 7 | 6 |
| 62-91 days (2 mo) | 51 | 7 | 7 | 1 | 5 | 9 | 6 | 16 |
| 92-122 days (3 mo) | 52 | 7 | 5 | 1 | 4 | 10 | 6 | 19 |
| 123-152 days (4 mo) | 53 | 9 | 3 | 0 | 2 | 6 | 6 | 27 |
| 153-182 days (5 mo) | 50 | 11 | 1 | 0 | 1 | 1 | 2 | 34 |



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| | | | | | | | | |
|-------------------|------------|-----------|-----------|----------|-----------|-----------|-----------|------------|
| Total | 305 | 41 | 44 | 6 | 27 | 47 | 35 | 105 |
| 0-<6 mo | | | | | | | | |

Table 8: 24-hour recall data for infants 6 - <10 months
Number of infants receiving food types

| Age of Infant 6- <10 months | Total No. of infants | No. receive no breastmilk : other liquids only | No. receive no breastmilk : other liquids and solids | No. receive only breastmilk | No. receive only breastmilk and vitamins | No. receive only breastmilk and water | No. receive only breastmilk, water, and juice | No. receive only breastmilk, formula or other milks, juices (no solids) | No. receive breastmilk with solids (allows any other liquids, milks or formula) |
|-------------------------------|----------------------|--|--|-----------------------------|--|---------------------------------------|---|---|---|
| 183-213 days (6 mo) | 52 | 4 | 4 | 2 | 0 | 1 | 1 | 8 | 32 |
| 214-243 days (7 mo) | 49 | 3 | 5 | 1 | 0 | 1 | 1 | 3 | 35 |
| 244-274 days (8 mo) | 53 | 6 | 8 | 1 | 1 | 1 | 0 | 1 | 35 |
| 275-304 days (9 mo) | 50 | 3 | 16 | 0 | 0 | 0 | 1 | 2 | 28 |
| Total 6-< 10 months | 204 | 16 | 33 | 4 | 1 | 3 | 3 | 14 | 130 |



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APPENDIX 4. INDICATORS: DEFINITIONS AND ILLUSTRATIVE COMPUTATIONS

A. Breastfeeding Rates

1. Exclusive Breastfeeding Rate (EBR)*
2. Predominant Breastfeeding Rate (PBR)*
3. Never Breastfed Rate*

B. Timely Initiation of Breastfeeding

4. Initiation of Breastfeeding in the First Hour of Life*

C. Duration of Any Breastfeeding

- 5a. Continued Breastfeeding Rate at 12 Months*
- 5b. Continued Breastfeeding Rate at 24 Months*
6. Mean Duration of Breastfeeding*
7. Median Duration of Breastfeeding**

D. Intensity of Breastfeeding

8. Frequency of Breastfeeding in 24 Hours*
9. Full/Partial/Token Breastfeeding***
- 10a. Mean Duration of Lactational Amenorrhea*
- 10b. Median Duration of Lactational Amenorrhea*

E. Timely Complementary Feeding

11. Timely Complementary Feeding Rate*

F. Family Planning Use among Nursing Mothers

- 12a. Appropriate Family Planning among Nursing Mothers
- 12b. Any Family Planning among Nursing Mothers*

G. Table 9. Comparison of Commonly Used Breastfeeding Indicators

* Adapted from (1).

** Adapted from (7).

*** Adapted from (15).



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A. BREASTFEEDING RATES

1. EXCLUSIVE BREASTFEEDING RATE (EBR)

DEFINITION

The percent of infants aged 0 - <6 months (0-182 days) who are being exclusively breastfed. An infant is considered to be exclusively breastfed if he/she receives only breastmilk with no other liquids or solids, with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines.

MEASUREMENT

The Exclusive Breastfeeding Rate (EBR) is calculated as:

$$\frac{\text{\# of infants 0 - <6 months exclusively breastfed}}{\text{total \# of infants 0 - <6 months}} \times 100$$

ILLUSTRATIVE COMPUTATION #1

Among 335 living infants aged 0 - <6 months (0 - 182 days), in the previous 24 hours:

33 were not breastfed

56 received only breastmilk

12 received breastmilk with vitamin drops, but nothing else (vitamins/medicines may *not* be diluted with water)

59 received breastmilk with water, but nothing else

71 received breastmilk with water and fruit juice, but nothing else

25 received breastmilk with formula and fruit juice, but no solids

79 received breastmilk with solid foods

In this example, 68 children are exclusively breastfed (56+12), so the Exclusive Breastfeeding Rate is $(68 \div 335 \times 100) = 20.3\%$.

DATA REQUIREMENTS

1. The number of living infants aged 0 - <6 months.



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2. 24-hour recall data of all liquids and solids consumed by living infants 0 - <6 months. Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids.

DATA SOURCE(S)

Population-based surveys.

PURPOSE AND ISSUES

WHO recommends that infants should be fed exclusively on breastmilk from birth to about six months of age. This indicator is used to give an overall measure of the degree to which women have adopted behaviors consistent with this recommendation.

The indicator gives equal weight to a reduction in the duration of exclusive breastfeeding and to a reduction in the percent of women who ever exclusively breastfeed. For example, a population in which three-quarters of infants are exclusively breastfed for four months and one-quarter are never exclusively breastfed would have the same value on this indicator as would a population in which **all** infants are exclusively breastfed for three months.

The indicator should be interpreted as the percent of infants who “are currently being exclusively breastfed” rather than the percent who “have been exclusively breastfed since birth.” The use of a 24-hour recall period may cause the indicator to overestimate the percent of infants who have never ingested anything except breastmilk since birth, since some infants who are given other liquids irregularly may not have received them in the 24 hours before the survey. If retrospective data are collected to capture this information **the results are not comparable to 24-hour recall data.**

In some surveys, the number of births each month could vary considerably, perhaps due to survey methodology, sampling error or seasonality of births. Such variation could affect the calculation of the EBR. For example, if there are many more zero-month-olds than three-month-olds in the sample, the EBR will be biased upward since younger children are more likely to be exclusively breastfed. In this case, it might be useful to age-adjust the percent exclusively breastfed, assuming that the number of births each month is constant.

Data in Table 7 in Appendix 3 are used for Illustrative Computations # 2 and #3. Once the data have been sorted as in Table 7, the proportion of infants exclusively breastfeeding for each age group can easily be determined.

ILLUSTRATIVE COMPUTATION #2: Exclusive Breastfeeding Rate, by month



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Using data from Table 7, for infants <1 month of age, 16/50 infants received only breastmilk and 2/50 received breastmilk and vitamins. The Exclusive Breastfeeding Rate for infants from this study who are younger than 1 month is therefore $(18 \div 50 \times 100) = 36\%$. The Exclusive Breastfeeding Rate for infants 3 months of age is $(6 \div 52 \times 100) = 11.5\%$.

ILLUSTRATIVE COMPUTATION #3: Exclusive Breastfeeding Rate, 2 - <4 months

Using the data from Table 7, among the 103, 2 - <4-month old living infants, in the previous 24 hours:

- I. 14 were not breastfed
- ii. **12 received only breastmilk (7 + 5)**
- iii. **2 received breastmilk and vitamins but nothing else**
- iv. 9 received breastmilk and only water
- v. 9 received breastmilk plus water and other liquids
- vi. 12 received breastmilk plus water, other liquids, and formula or other milks
- vii. 35 received breastmilk plus water, other liquids, milks or formula, and solids

Therefore, the Exclusive Breastfeeding Rate for infants 2 - <4 months is $(14 \div 103 \times 100) = 13.5\%$.



2. PREDOMINANT BREASTFEEDING RATE (PBR)

DEFINITION

The percent of infants aged 0 - <6 months (0-182 days) who are being predominantly breastfed. An infant is considered to be predominantly breastfed if he/she receives breastmilk along with water, water-based drinks (sweetened and flavored water, teas, infusions, etc.), fruit juice, oral rehydration salts (ORS) solution, but does not receive any other liquids or solids. No food-based fluids (except fruit juice and sugar-water) are allowed.

MEASUREMENT

The predominant breastfeeding rate is calculated as:

$$\frac{\text{\# of infants 0 - <6 months predominantly breastfed}}{\text{total \# of infants 0 - <6 months}} \times 100$$

ILLUSTRATIVE COMPUTATION #1

Among 335 living infants, in the previous 24 hours:

- 33 were not breastfed
- 56 received only breastmilk
- 12 received breastmilk with vitamin drops but nothing else
- 59 received breastmilk with water but nothing else**
- 71 received breastmilk with water and fruit juice but nothing else**
- 25 received breastmilk with formula and fruit juice, but no solids
- 79 received breastmilk with solid foods

In this example, 130 children are predominantly breastfed (59+71), so the Predominant Breastfeeding Rate is $(130 \div 335 \times 100) = 38.8\%$.

DATA REQUIREMENTS

1. The number of living infants aged 0 - <6 months (0-182 days).



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2. The number of these infants predominantly breastfed, based on a 24-hour recall of liquids and solids consumed. Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids.



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DATA SOURCE(S)

Population-based surveys.

PURPOSE AND ISSUES

Although it is recommended that young infants be exclusively breastfed, the introduction of water, ritual foods, teas, juices, etc. in small quantities is not especially important to the infant's nutrition. Introducing these items does not appear to affect the relationship between breastfeeding and the duration of postpartum amenorrhea. This indicator is used to give an overall measure of predominant breastfeeding.

This indicator is the same as that described by the informal WHO Working Group on infant feeding indicators, with two clarifications. First, infants receiving breastmilk and vitamin, mineral, or medicine drops or syrups are considered to be exclusively breastfed, not predominantly breastfed. The categories of exclusive breastfeeding and predominant breastfeeding are mutually exclusive, and so the rates can be added together. The sum of the EBR and the PBR represents the percent fully breastfed. Second, WHO has subsequently simplified guidance regarding the recommended ages for exclusive breastfeeding. The earlier recommendation was 4-6 months; the current recommendation is about 6 months.

(Refer to the "exclusive breastfeeding rate" indicator for further notes on this indicator.)

ILLUSTRATIVE COMPUTATION #2: Predominant Breastfeeding Rate, 0 - <6 months

Using the same data from Table 7, among the 305 infants aged 0 - <6 months, in the previous 24 hours:

41 were not breastfed

44 received only breastmilk

6 received breastmilk and vitamins but nothing else (2 + 2 + 1 + 1 + 0 + 0)

27 received breastmilk and only water (7 + 8 + 5 + 4 + 2 + 1)

47 received breastmilk plus water and other liquids (12 + 9 + 9 + 10 + 6 + 1)

35 received breastmilk plus water, other liquids, and formula or other milks

105 received breastmilk plus water, other liquids, milks or formula, and solids

Using these figures, the total number of predominantly breastfed infants is (27 + 47) = 74. The Predominant Breastfeeding Rate is $(74 \div 305 \times 100) = 24.3\%$.



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3. NEVER BREASTFED RATE

DEFINITION

The proportion of infants never given breastmilk over the proportion of live births, in a reference time period.

MEASUREMENT

Never breastfed rate =

$$\frac{\text{\# of children never receiving breastmilk}}{\text{\# of live births}} \times 100$$

during a reference time period.

DATA REQUIREMENTS

Number or proportion of respondents reporting that breastmilk was never given to their infants in a sample of live births.

DATA SOURCE(S)

1. Population-based surveys.

PURPOSE AND ISSUES

This measure is often used in surveys to determine the proportion of women ever attempting to breastfeed. One issue to be considered is whether to include infants who are given expressed breastmilk rather than fed at the breast. Premature infants are often unable to suck and may be given expressed breastmilk. This is likely to be the only breastmilk for those who die within the first week. Omission of such infants would bias the numbers downward, since any live-born prematures would be included in the denominator. Since the proportion of infants never breastfed may be quite low, sometimes under one percent, the need to consider such a bias is more than theoretical.

Assessment of the never breastfed rate is meaningful and necessary to interpret prevalence of breastfeeding and full breastfeeding at later points in time.



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B. TIMELY INITIATION OF BREASTFEEDING**4. INITIATION OF BREASTFEEDING IN THE FIRST HOUR OF LIFE****DEFINITION**

The percentage infant 0 - <12 months of age who were put to the breast within one hour of birth.

MEASUREMENT

For a population-based survey, it is calculated as:

$$\frac{\text{\# of infants 0 - <12 months of age who were put to the breast within one hour of birth}}{\text{total \# of infants 0 - <12 months of age}} \times 100$$

An output/program level version of this indicator is:

$$\frac{\text{\# of infants discharged during reference period who were put to the breast one hour after birth}}{\text{total \# of infants discharged during reference period}} \times 100$$

These two indicators are not comparable.

DATA REQUIREMENTS

Population-level:

1. number of infants 0 - <12 months of age in the population or subpopulation sample; and,
2. number of infants 0 - <12 months of age reported to have been put to the breast within one hour of birth.

Program-level:



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1. number of infants discharged from a facility and the number of infants discharged who breastfed within one hour of birth.

DATA SOURCE(S)

1. Version 1: Population-based surveys.
2. Version 2: Facility-based observations or exit surveys.

PURPOSE AND ISSUES

One issue to consider is whether or not to exclude Caesarean births, exclude facilities with high levels of Caesarean births, or define a different criterion for Caesarean or high risk births. Many researchers now prefer to use a single criterion (typically one hour, although some argue for one half hour) regardless of the number of Caesarean or other high risk births. The rationale for this approach, which is endorsed here, is that defining overly stringent criteria for risk can be a major stumbling block to rooming in; therefore, infants who are unable to room-in with their mothers because they are defined as high risk and/or delivered by Caesarean section should be captured by the data. As of this writing, the Baby-Friendly Hospital Assessment Tools use a four-hour criterion for Caesarean births. Using different periods of time for normal versus Caesarean deliveries creates two different indicators and requires additional information which may also be biased.

The purpose of the indicator is to assess whether mothers in the population and/or in health facilities initiate early breastfeeding with its respective benefits to both mother (reduced postpartum hemorrhage) and infant (skin-to-skin contact and exposure to maternal antibodies in colostrum). WHO has defined this indicator as both a household and a facility-based indicator.

The **population-based indicator's** denominator is broad (all infants under twelve months of age) and may introduce a significant recall bias as women may have difficulty recalling when they initiated breastfeeding and whether this was within one hour. This indicator may also mask changes in population or health facility practices that have occurred within one year.

The **facility-based indicator** does not have as much recall bias but individual facility-based rates would need to be aggregated to determine population-level trends and would be inappropriate in settings where home births are occurring. Since home births occur almost everywhere, it is not recommended that facility-based data be aggregated and interpreted as population-based indicators.



C. DURATION OF ANY BREASTFEEDING

5a. CONTINUED BREASTFEEDING AT 12 MONTHS

DEFINITION

The percentage of children 12 - <16 months of age (366-426 days) who are breastfed.

MEASUREMENT

The indicator is calculated as follows:

$$\frac{\text{children 12 - <16 months of age breastfed in the last 24 hours}}{\text{live children 12 - <16 months of age}} \times 100$$

DATA REQUIREMENTS

1. A representative sample of children 12 - <16 months.
2. Mother's reporting of each child's food/liquid consumption in the 24 hours preceding the interview.
3. Child's age.

DATA SOURCE(S)

Typically this indicator is measured using a population-based household survey of all living children aged 12 - <16 months of age. The indicator is based on current status data, i.e. (I) the current age of the child, and (ii) mother's 24-hour recall of any liquids or foods consumed during the 24 hours preceding the survey.

PURPOSE AND ISSUES

This is a measure of breastfeeding duration. It is a simple percentage and thus relatively easy to understand and compare. The four-month cross-section makes the indicator more reliable and useful with smaller samples.



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5b. CONTINUED BREASTFEEDING AT 24 MONTHS**DEFINITION**

The percentage of children 20 - <24 months of age (608-730 days) who are breastfeeding.

MEASUREMENT

The indicator is calculated as follows:

$$\frac{\text{children 20 - <24 months of age breastfed in the last 24 hours}}{\text{live children 20 - <24 months of age}} \times 100$$

DATA REQUIREMENTS

1. A representative sample of children 20 - <24 months.
2. Mother's reporting of each child's food/liquid consumption in the 24 hours preceding the interview.
3. Child's age.

DATA SOURCE(S)

Typically this indicator is measured using a population-based household survey of all living children 20 - <24 months of age. The indicator is based on current status data, i.e. (i) the current age of the child, and (ii) mother's 24-hour recall of any liquids or foods consumed during the 24 hours preceding the survey.

PURPOSE AND ISSUES

This is a measure of breastfeeding duration. It is a simple percentage and thus relatively easy to understand and compare. The four-month cross-section makes the indicator more reliable and useful with smaller samples. The four-month interval is not a serious liability at the end of two years when few programs are designed to change specific practices.



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6. MEAN DURATION OF ANY BREASTFEEDING

DEFINITION

The mean number of months that children are breastfed, regardless of what other fluids or foods they might also receive.

The mean duration of breastfeeding (MDBF) is calculated as:

$$\text{MDBF} = \sum \text{Proportion Breastfeeding (PBF)}_a \quad (a \text{ ranges from } 0 \text{ to } 59)$$

where PBF is the Proportion Breastfeeding:

$$\text{PBF}_a = \frac{\text{\# of infants aged } a \text{ months who are currently being breastfed}}{\text{\# of children born } a \text{ months ago}}$$

| ILLUSTRATIVE COMPUTATION | | | |
|------------------------------|--------------------------------|----------------------------------|-------|
| Completed Age (in months) | Infants Currently Breastfed | Living or Deceased Infants | PBF |
| 0 | 82 | 85 | 0.965 |
| 1 | 72 | 77 | 0.935 |
| 2 | 74 | 87 | 0.851 |
| 3 | 76 | 90 | 0.844 |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| 56 | 0 | 65 | 0.000 |
| 57 | 0 | 69 | 0.000 |
| 58 | 0 | 75 | 0.000 |
| 59 | 0 | 62 | 0.000 |

MDBF = (0.965 + 0.935 + 0.851 + 0.844 + . . . + 0.000 + 0.000 + 0.000 + 0.000) = 15.5



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months

Source: El Salvador Family Planning/Maternal and Child Health Survey, 1993.



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DATA REQUIREMENTS

1. The number of births within the last 60 months classified by single months ago.
2. The number of infants currently being breastfed, classified by single month of age.

DATA SOURCE(S)

Population-based surveys.

PURPOSE AND ISSUES

This indicator gives an overall measure of the extent of breastfeeding in the population. It combines information on the percent ever breastfed and the duration of breastfeeding among those who are breastfed. Children never breastfed are implicitly treated as being breastfed for zero months. Because all births are included in the denominator, even of children no longer living, the indicator gives the actual duration of breastfeeding, treating death as one of many reasons to stop breastfeeding.

Retrospective reports of how long a child was breastfed are not used to calculate the duration of breastfeeding, because this type of data is known to exhibit substantial heaping on durations which are multiples of six months. This heaping of responses likely reflects rounding, which is not necessarily symmetrical. As a result, the mean computed from retrospective data could be biased.

All children born in the time period should be included, not just last births. If only last-born children are included, the findings may be biased, and the bias may not be equal in all countries or among all population subgroups. By asking only about last-born children, children at the upper-end of the age range who have a younger sibling are excluded from the sample. Depending on the breastfeeding practices of the mother and her culture (e.g., whether or not the older child is breastfed along with the younger), the exclusion of these older children will influence the mean duration of breastfeeding of the sample.

The computation shown above assumes that age is given in completed months. If, instead, infants are classified by their average age in months (e.g., because date of birth is not ascertained), the mean should be reduced by $(0.5 \times \text{PBF}_0)$, where PBF_0 is calculated from births occurring in the month of interview (see (10)). In the example above, if the data referred to average age rather than completed age, the mean duration of breastfeeding would be 15.0 months $(15.5 - (0.965 \times 0.5))$.

The mean duration is recommended rather than the median, primarily because of the relative ease of calculating the mean. Computation of the median from current breastfeeding data requires that the data first be smoothed, a procedure that is not always straightforward. The mean tends to be slightly



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higher than the median (by about 0.5 to 1.0 months) because of very long breastfeeding practices by a small subset of women.

The calculation of this indicator is based on children under five years of age, because in many developing countries, a significant proportion of three- and four-year-olds are still being breastfed. The mean duration of breastfeeding would be underestimated if these children were excluded from the calculations. In countries in which the duration of breastfeeding is known to be short, perhaps less than twelve months, it can reasonably be assumed that children older than 36 months are not being breastfed. In this case, the data requirements can be reduced to include only children 0 - <36 months old.



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7. MEDIAN DURATION OF BREASTFEEDING

DEFINITION

The age (in months) when 50% or more of children are no longer breastfed.

MEASUREMENT

The median duration of breastfeeding is calculated based on current status data among all living children under five years of age, i.e. less than exact age 60 months¹. The first step in the calculation is to determine the proportion of all living children in each single-month age group who are still breastfeeding. The next step is to smooth these data by calculating a three-month moving average. The median duration of breastfeeding is the month of age when 50% or fewer of the children are still breastfed. Below is an illustrative computation of how to calculate the median duration.

PURPOSE AND ISSUES

Measuring the median duration of lactation is useful because this is a skewed phenomenon: many mothers may stop breastfeeding early while others continue for many months. Therefore, a mean may be deceptive, especially when measuring trends over time. In fact, quartiles would be more revealing.

¹ At a minimum, the median duration of breastfeeding should be based on data from children under 36 months, especially in countries and among population subgroups where the median duration of breastfeeding is close to 24 months. If data are available only for children under 24 months of age, and if more than 50% of the children are still breastfeeding at 24 months of age, the median duration could be expressed as "longer than 24 months."



ILLUSTRATIVE COMPUTATION

| Age group (current age of child in mos) | Number of children | Number breastfeeding | % still breastfeeding | 3-month moving average ¹ |
|---|-----------------------|-------------------------|--------------------------|---|
| 1 | . | . | . | . |
| 2 | . | . | . | . |
| 3 | . | . | . | . |
| 4 | . | . | . | . |
| 5 | . | . | . | . |
| 6 | . | . | . | . |
| 7 | . | . | . | . |
| 8 | . | . | . | . |
| 9 | . | . | . | . |
| 10 | . | . | . | . |
| 11 | . | . | . | . |
| 12 | . | . | . | . |
| 13 | . | . | . | . |
| 14 | . | . | . | . |
| 15 | . | . | . | . |
| 16 | 100 | 63 | 63 | . |
| 17 | 100 | 60 | 60 | 59 |
| 18 | 100 | 56 | 56 | 56 |
| 19 | 100 | 52 | 52 | 52 |
| 20 | 100 | 47 | 47 | 50 |
| 21 | 100 | 51 | 51 | 48 |
| 22 | 100 | 45 | 45 | 47 |
| 23 | 100 | 44 | 44 | 44 |
| 24 | 100 | 42 | 42 | 41 |
| 25 | 100 | 38 | 38 | . |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |

¹ This is calculated by averaging the percentages for three months and assigning the result to the middle month, e.g., the three-month average for month 19 above is $(56 + 52 + 47) \div 3 = 52$.



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The median duration of breastfeeding is 20 months.

*This is calculated by averaging the percentages for 3 months and assigning the result to the middle month, e.g., 3-month average for month 19 is $\frac{56 + 52 + 47}{3} = 52$.

D. INTENSITY OF BREASTFEEDING

8. FREQUENCY OF BREASTFEEDING IN 24 HOURS

DEFINITION

The average number of suckling episodes reported within the last 24 hours across breastfeeding mothers.

MEASUREMENT

Mean is calculated as follows:

$$\frac{\text{sum of all suckling episodes in previous 24 hours of infants in a one-month age cohort}}{\text{\# of breastfeeding infants in a one-month age cohort}}$$

This indicator should be calculated and reported by months of infant age.

DATA REQUIREMENTS

1. Response to questionnaire items asking the frequency of breastfeeding during the daylight hours (day feeds) and from the setting of the sun to daylight the next day (night feeds). The responses to these are totaled for the 24-hour frequency.
2. Age of infant in months.

DATA SOURCE(S)



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Information on the past 24 hours collected from breastfeeding mothers through household survey or exit interviews in facilities.

PURPOSE AND ISSUES

The number of breastfeedings per 24 hours is a helpful measure since suckling at the breast is such an important intermediate determinant of milk output and of ovulation suppression during lactation. Increased suckling frequency leads to both increased milk output and suppression of fertility. Frequently, programs to improve infant feeding focus efforts on increasing or maintaining suckling frequency.



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The indicator can only be used for current status. In addition, women may answer “on demand.” In DHS-I surveys, a large proportion of women reported on demand feeding. For DHS-II, a probe was added to further request the number of feeds during the day and night, leading to a much higher proportion giving an actual number of feeds. At the upper end of the distribution, with frequent on demand feeds, it becomes difficult for women to report the actual number of feeds. The effect of loss of precision at the upper end of the distribution is likely to be tolerable for most analytical purposes, and is mitigated by using the median rather than the mean as an indicator of central tendency.

Mean and median are both informative indicators because frequencies are highly reliable within and between infants, across ages of infants (younger infants suckle more frequently), and across cultures. The median is often more appropriate and obtainable because of uncertainty about numbers of night feeds and non-normal distributions. The median can be approximated by listing the number of suckling episodes in order of magnitude. The number of episodes for the mother at the middle of the list (the $n/2$ position in the distribution) is the median value. This is only an estimate, since calculation of an exact median may require estimation between two value categories.

ILLUSTRATIVE COMPUTATION: Frequency of Breastfeeding in the Last 24 Hours

If you asked the mothers of the 50 infants in the 0 - 30 days age group (from Table 5) about how often they had breastfed their infants in the past 24 hours, the data might look like those below.

| Infant ID# | # of times BF last night, sunset to sunrise | # of times BF yesterday daylight hours | Total number of times breastfed yesterday |
|------------|---|--|---|
| 001 | 4 | 4 | 8 |
| 002 | 5 | 8 | 13 |
| 003 | 6 | 4 | 10 |
| 004 | 3 | 9 | 12 |
| 005 | 10 | 5 | 15 |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| . | . | . | . |
| 048 | 5 | 5 | 10 |
| 049 | 5 | 4 | 9 |
| 050 | 6 | 3 | 9 |
| Total: | | | 600 |

To calculate the average number of nursing episodes, add the total number of times each infant is breastfed (8



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+ 13 + 10 + 12 + 15...10 + 9 + 9 = 600). Then divide the total by the number of infants in the age cohort $600 \div 50 = 12$. Thus, the mean frequency of breastfeeding in the 0 - 30 day age cohort is 12 times a day.



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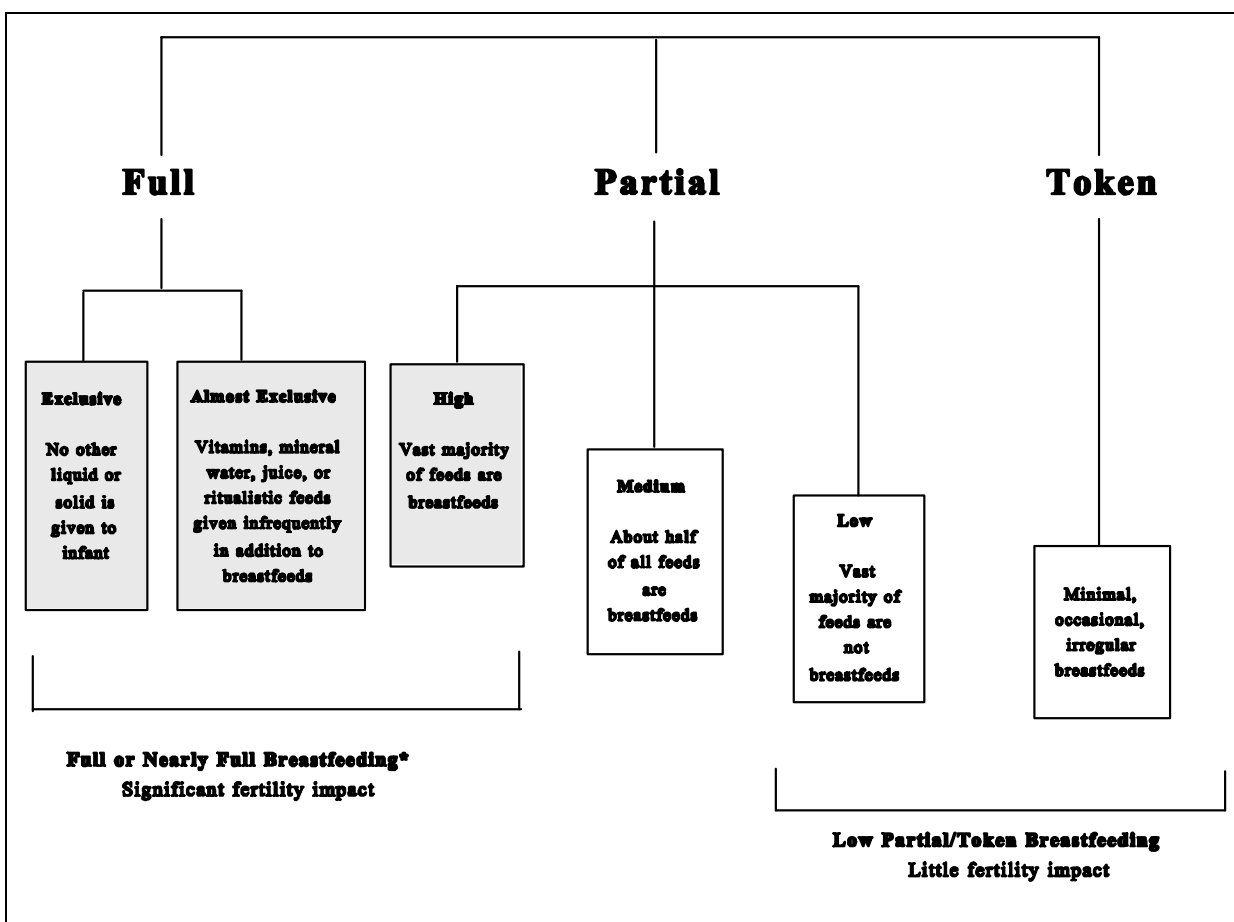
9. FULL/PARTIAL/TOKEN BREASTFEEDING

DEFINITION

Full, partial, and token breastfeeding are best defined by the schema below (11, 12, 15). Full or nearly full breastfeeding is also defined clinically as a pattern that will maintain both milk supply and amenorrhea.

Breastfeeding patterns are highly variable. The following diagram defines the different patterns and indicates their physiological impact on both fertility and milk production.

Schema for Breastfeeding Definition



*Intervals should not exceed four hours during the day, six hours at night, and supplementation should not exceed 5-15% of all feeding episodes, probably fewer. While the high-partial pattern is adequate for fertility suppression, the women should be counseled that any supplementation or disruption of the breastfeeding pattern can increase the risk of fertility return.

MEASUREMENT

Calculation of Percent of all Feeds that are Breastfeeds

The calculation of percent of all feeds that are breastfeeds was initially developed at Johns Hopkins University by Gray et al., and has been used by IRH and WHO in studies of associations with breastfeeding success. This is calculated by making the “number of times breastfed” the numerator and the “number of times of any food or liquids are given” the denominator. This percentage has also been used at Bellagio conferences and for the Inter-Agency Group for Action on Breastfeeding (IGAB) definitions of Full Breastfeeding (at least 85% of feeds are breastfeeds), Partial (15-85% of feeds are breastfeeds, and Token (fewer than 15% of feeds are breastfeeds). Clearly, infants defined as “predominantly breastfed” are not necessarily experiencing patterns of feeding that promote continuation of milk supply nor maintenance of amenorrhea.

ILLUSTRATIVE COMPUTATION: Full/Partial/Token Breastfeeding

Infant A received 4 breastfeeds, 1 water feed, 3 juices and 2 rice-water feedings. The percent of all feeds that are breastfeeds would be:

$$4 / (4 + 1 + 3 + 2) \times 100 = 40\% \text{ Infant A is only "partially breastfed."}$$

Infant B received 8 breastfeeds and 1 water feed. The percent of all feeds that are breastfeeds would be:

$$8 / (8 + 1) \times 100 = 89\%. \text{ Infant B is "fully or nearly fully breastfed."}$$

Infant C received 9 breastfeeds and 1 vitamin feed. Infant C is “fully breastfed.”

Infant D received 3 breastfeeds, 8 formula feeds, 6 juice feeds as well as vitamins and medicines.

$$3 / 18 \times 100 = 18\%. \text{ Infant D is "token breastfed."}$$

An illustration of the use of this indicator in assessing breastfeeding program impact is included in Appendix 9.

DATA REQUIREMENTS

24-hour recall data.

DATA SOURCE(S)



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Population-based surveys and exit surveys.

PURPOSE AND ISSUES

These definitions are based on the physiological impact of breastfeeding and are better proxies for breastfeeding intensity than terms such as “predominant,” that have no control for quantities.



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10a. MEAN DURATION OF LACTATIONAL AMENORRHEA

DEFINITION

The mean number of months that women experience lactational amenorrhea following a live birth.

MEASUREMENT

The mean duration of lactational amenorrhea (MDLA) is calculated as:

$$MDLA = \sum PLA_a \quad (a \text{ ranges from } 0 \text{ to } 59)$$

where PLA is the Proportion experiencing Lactational Amenorrhea:

$$PLA_a = \frac{\begin{array}{l} \text{\# of currently breastfed children aged } a \text{ months} \\ \text{whose mothers have not resumed menstruation} \end{array}}{\text{\# of births } a \text{ months ago}}$$

| ILLUSTRATIVE COMPUTATION | | | |
|--|---|--------|-------|
| Completed Age of Child (in months) | Breastfeeding Mothers without Return to Menses | Births | PLA* |
| 0 | 77 | 85 | 0.906 |
| 1 | 62 | 77 | 0.805 |
| 2 | 54 | 87 | 0.621 |
| 3 | 50 | 90 | 0.556 |
| 4. | | | |
| 5. | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9. | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |



| | | | | |
|---|----|---|----|-------|
| . | 13 | | | |
| . | 14 | | | |
| . | 15 | | | |
| | 56 | 0 | 65 | 0.000 |
| | 57 | 0 | 69 | 0.000 |
| | 58 | 0 | 75 | 0.000 |
| | 59 | 0 | 62 | 0.000 |

MDLA = (0.906 + 0.805 + 0.621 + 0.556 + . . . + 0.000 + 0.000 + 0.000 + 0.000) = 6.6 months

* Proportion experiencing lactational amenorrhea; to calculate, divide the number not menstruating by the number of births (e.g. at 0 months, 77/85=.906).

Once the PLA is consistently 0.000, it is not necessary to include it in the calculation of mean duration.

Source: El Salvador Family Planning/Maternal and Child Health Survey, 1993.



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DATA REQUIREMENTS

1. The number of births within the last 60 months classified by single months of age.
2. The number of these infants meeting the following criteria: infant currently being breastfed; no return of maternal menstruation; no subsequent birth to mother. The numbers of infants must be grouped by single month of age.

All postpartum intervals that have been closed by a subsequent pregnancy are treated as if menses did return in the month of conception.

DATA SOURCE(S)

Population-based surveys.

PURPOSE AND ISSUES

This indicator measures the length of time between birth and return to menses which is related to breastfeeding.

The denominator used in the calculation of the percent experiencing lactational amenorrhea is births a months ago, which is slightly different from the denominator used for the mean duration of breastfeeding, which is children born a months ago. The difference is that twins count as one birth but two children.

The denominator range (of months following a live birth) should encompass the maximum duration of lactational amenorrhea in the target populations. In some populations shorter ranges will be workable and might, for example, permit calculation of this indicator based on data collected from women 0 - <36 months postpartum. If, however, the data available to you do not include the maximum duration of lactational amenorrhea in the target population, it would be preferable to use median rather than mean duration as the appropriate calculation.

(Refer to the “mean duration of breastfeeding” indicator for further notes on this indicator.)



10b. MEDIAN DURATION OF LACTATIONAL AMENORRHEA

DEFINITION

The median number of months that women experience lactational amenorrhea following a live birth.

MEASUREMENT

The median duration of lactational amenorrhea is calculated based on current status data for births from 0 - 59 (<60) months ago.

The first step in the calculation is to determine the proportion of all mothers in each single-month group who have not yet resumed their menses. The next step is to smooth these data by calculating a three-month moving average. The median duration of lactational amenorrhea is the month when 50% (0.500) or fewer women still experience lactational amenorrhea.

PURPOSE AND ISSUES

Measuring the median duration of lactational amenorrhea is useful because the variable "amenorrhea" is often skewed (i.e. a few women may have especially long durations of amenorrhea, or especially short durations, and these data influence the calculated mean in a way that makes it non-representative of most women; or, data are available only for mothers of children in a limited age range). Also, when there are only small numbers of women, it is possible that there will be more than one "median" value. In such an instance, the mean has the advantage of providing a single, "average" value for duration.

| ILLUSTRATIVE COMPUTATION | | | | |
|--|---|--------|-------|--------------------------------|
| Completed Age of Child (in months) | Breastfeeding Mothers without Return to Menses | Births | PLA* | 3-Month Moving Average** |
| | | | | |
| 1 | *** | 83 | | |
| 2 | 77 | 85 | 0.906 | |
| 3 | 62 | 77 | 0.805 | 0.777 |
| 4 | 54 | 87 | 0.621 | 0.661 |
| 5 | 50 | 90 | 0.556 | 0.573 |
| 6 | 46 | 85 | 0.541 | 0.541 |



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| | | | | |
|----|----|----|-------|-------|
| 7 | 40 | 76 | 0.526 | 0.520 |
| 8 | 41 | 83 | 0.494 | 0.500 |
| 9 | 36 | 75 | 0.480 | 0.478 |
| 10 | 36 | 78 | 0.461 | 0.454 |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 56 | 0 | 65 | | |
| 57 | 0 | 69 | | |
| 58 | 0 | 75 | | |
| 59 | 9 | 62 | | .. |

* Proportion in lactational amenorrhea; to calculate, divide the number not menstruating by the number of births (e.g. at 0 months, 77 / 85=.906).

** This is calculated by averaging the percentages for three months and assigning the result to the middle month, e.g., three-month average for month five above is $(0.621 + 0.556 + 0.541) / 3 = 0.573$.

*** Bleeding during the first eight weeks (i.e., months zero and one) is not considered a menses in lactating women.

The median duration is the month when the PLA is equal to or less than 0.500, i.e., when 50% or fewer of the women still experience lactational amenorrhea. In the above illustrative computation, the median duration of lactational amenorrhea (where the PLA is equal to 0.500) is eight months.



DATA REQUIREMENTS

1. The number of births within the last 60 months classified by single months of age.
2. The number of these infants meeting the following criteria: infant currently being breastfed; no return of maternal menstruation; no subsequent birth to mother. The numbers of infants must be grouped by single month of age.

All postpartum intervals that have been closed by a subsequent pregnancy are treated as if menses did return in the month of conception.

DATA SOURCE(S)

Population-based surveys.

PURPOSE AND ISSUES

The duration of lactational amenorrhea has been suggested as a single proxy for the effectiveness of breastfeeding, reflecting both the maternal physiological response and the strength of the baby's suck in maintaining the milk supply. Therefore, if a single measure is used to follow breastfeeding trends in a population, the change in median duration of amenorrhea has been suggested (11).



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E. TIMELY COMPLEMENTARY FEEDING

11. TIMELY COMPLEMENTARY FEEDING RATE

DEFINITION

Proportion of infants 6 - <10 months of age (183-304 days) receiving complementary foods according to breastfeeding status. The basic indicator uses 24-hour recall of whether the infant received breastmilk and/or solid foods (see Purpose and Issues). Solids are defined as foods of mushy or solid consistency, not fluids.

MEASUREMENT

Measurement of this indicator involves determining the proportion of infants receiving timely complementary feeding as well as other feeding patterns, according to breastfeeding status. The indicator shows the percentage of children in the following four (non-overlapping) categories:

Among children 6 - <10 months of age (183-304 days), the percentage who receive:

- breastmilk and solids (a) (timely complementary feeding);
- breastmilk, but no solids (b);
- no breastmilk, but solids (c); and,
- no breastmilk, and no solids (d).

The sum of a + b + c + d = 100%.

The basic complementary feeding rate is calculated as follows:

$$a) \quad \frac{\text{\# of infants 6 - <10 months given breastmilk and solid foods in the last 24 hours}}{\text{total \# of infants 6 - <10 months of age}} \times 100$$

$$b) \quad \frac{\text{\# of infants 6 - <10 months given breastmilk but not solid foods in the last 24 hours}}{\text{total \# of infants 6 - <10 months of age}} \times 100$$

$$c) \quad \frac{\text{\# of infants 6 - <10 months not given breastmilk but given solid foods in the last 24 hours}}{\text{total \# of infants 6 - <10 months of age}} \times 100$$



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----- x 100
total # of infants 6 - <10 months of age



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$$d) \quad \frac{\text{\# of infants 6 - <10 months not given breastmilk nor solid foods in the last 24 hours}}{\text{total \# of infants 6 - <10 months of age}} \times 100$$

ILLUSTRATIVE COMPUTATION #1

In a population of 1000 infants 6 - <10 months of age, feeding practices are as follows:

- a) 250 received breastmilk and complementary foods, i.e. complementary solids, and may also have received juice, liquids, and other milks;
- b) 400 received breastmilk, but no complementary foods, i.e. no complementary solids, but may have received juice, liquids, or other milks;
- c) 250 received no breastmilk, but did receive complementary foods, i.e. complementary solids, and may also have received juice, liquids, or other milks; and,
- d) 100 received no breastmilk, and no complementary foods, i.e. no complementary solids, but may have received juice, liquids, or other milks.

Most infants in this age group (6 - <10 months) reported to have received no breastmilk are given other milks. In a few cases (e.g., a sick child), a child who did not receive breastmilk may not have received any other milk either. For the purposes of this indicator, these children should be included in one of the last two categories (c or d).

The findings discussed above can be presented as a stacked bar or as a two-by-two table.

DATA REQUIREMENTS

1. A representative sample of children 6 - <10 months of age.
2. Information about feeding practices in the last 24 hours, including breastfeeding status and whether the child was given solid foods.

DATA SOURCE(S)

Population-based surveys employing representative samples (e.g., DHS surveys) should be used to estimate the feeding practices in a given population.

PURPOSE AND ISSUES

It is recommended that after exclusive breastfeeding for the first 6 months of life, children continue to be breastfed with addition of appropriate and adequate complementary foods. The complementary



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feeding indicator is intended as a basic, simple indicator of feeding patterns among children in the age group 6 - <10 months. This age group is chosen since, by this age, infants should be receiving solid foods. The timely complementary feeding indicator described above provides minimal information to assess whether children are fed according to guidelines. It does not contain information about how frequently a child is given solid foods, nor about food quantity or food quality (e.g., energy density, or micronutrient composition). The indicator can be modified to provide more detailed information about these aspects of feeding practices by collecting additional information from the mother.

It is recommended that even if the information collected is expanded beyond the basic questions of whether the child received breastmilk and/or solid foods in the last 24 hours, the basic indicator defined above should be used in addition to a more expanded indicator. The reason for showing the basic indicator in addition to more in-depth information that may be included in some surveys or evaluations is that comparison of feeding practices for different population subgroups and assessment of secular changes in feeding practices are simplified if there are some basic indicators that are reported consistently.

The timely complementary feeding rate indicator can also be used for selected groups of children. Representative samples of specific population subgroups can be used. The indicator can also be calculated for participants in specific programs (e.g., programs that promote good feeding practices among young children, and children seen in well baby clinics and immunization clinics).

ILLUSTRATIVE COMPUTATION #2: Timely Complementary Feeding Rate

Using Table 8 for data on infants 6-< 10 months, in the past 24 hours:

- 1.4 received only breastmilk
- 2.1 received only breastmilk and vitamins
- 3.3 received breastmilk and water
- 4.3 received breastmilk and other liquids
- 5.16 received no breastmilk and only other liquids
- 6.33 received no breastmilk and both other liquids and solids
- 7.14 received breastmilk, other milks and liquids but no solids
- 8.130 received breastmilk with solids and other liquids

Complementary feeding practices are described as four patterns: a) breastmilk and solids (line 8); b) breastmilk but no solids (lines 1-4, 7); c) no breastmilk but solids (line 6); d) no breastmilk, no solids (line 5)

Using data from Table 8, the computations are as follows:

$$a = (130 \div 204) \times 100 = 63.7\%$$

$$b = (4 + 1 + 3 + 3 + 14 \div 204) \times 100 = 12.3\%$$



$$c = (33 \div 204) \times 100 = 16.2\%$$

$$d = (16 \div 204) \times 100 = 7.8\%$$

The data may be presented as a stacked bar.



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F.FAMILY PLANNING USE AMONG NURSING MOTHERS

12a.APPROPRIATE FAMILY PLANNING AMONG NURSING MOTHERS

DEFINITION

Use of appropriate methods of family planning or contraception among nursing mothers.

Practices are grouped into four categories: Percent nursing mothers using permanent methods, intrauterine contraceptive device (IUD), barrier methods, or progestin-only methods; percent using combined oral contraceptives; percent using “natural” or traditional methods, including LAM; and, percent not using a method.

MEASUREMENT

The indicator is calculated as a percentage distribution, with all nursing mothers as the denominator. Four major categories are proposed (A through D), with possible subcategories shown.

A1. Percent using one or more of the following:

- IUD
- tubal ligation
- vasectomy

A2. Percent using the following (but none of the above methods):

- condom

A3. Percent using the following (but none of the above methods):

- vaginal barrier method (diaphragm, foam, jelly, spermicide, female condom)

A4. Percent using one or more of the following (but none of the above methods):

- progestin-only hormonal injectable (e.g., Depo-Provera)
- implant (e.g., NORPLANT)
- progestin-only oral contraceptive

B1. Percent using the following (but none of the above methods):

- combined oral contraceptive pills
- combined hormonal injectable
(generally not recommended for nursing mothers due to decrease in milk supply)



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- C1. Percent using the following (but none of the above methods):
 - LAM (with plan for contraceptive use after LAM)
- C2. Percent using the following (but none of the above methods):
 - periodic abstinence: ovulation method, sympto-thermal method, traditional calendar (The last cannot be used until menstruation has returned.)
- C3. Percent using the following (but none of the above methods):
 - traditional method (withdrawal, local herbal preparations, teas, etc.)
- D1. Percent using the following (but none of the above methods):
 - no method, but would like to get pregnant
- D2. Percent using the following (but none of the above methods):
 - no method, but would not like to become pregnant

The sum of A1 + A2 + A3 + A4 + B1 + C1 + C2 + C3 + D1 + D2 = 100%.

The percentage of women in each category is calculated as (example for category A1):

$$A1 = \frac{\text{\# of nursing mothers using IUD or tubal ligation or vasectomy (by category of time since delivery)}}{\text{total \# of nursing mothers (by category of time since delivery)}} \times 100$$

The basic indicator should be shown as the percent of women in each of the four major categories. This can be graphically displayed as a stacked bar. Some programs may also choose to show the percentages in some of the subcategories (see “Purpose and Issues” below).

DATA REQUIREMENTS

1. A representative sample of nursing mothers.
2. Information on current contraceptive use.
3. Information about desire to become pregnant in the near future.



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4. Age of infant/time since delivery, to do analysis according to the time postpartum. This is highly recommended, since the appropriateness of methods cannot be determined without it. (See "Purposes and Issues" below)

DATA SOURCE(S)

Population-based surveys employing representative samples (e.g., DHS surveys) should be used to estimate whether nursing mothers are using effective and appropriate contraceptive methods.



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PURPOSE AND ISSUES

Breastfeeding women have contraceptive needs that differ significantly from those of non-breastfeeding women. Breastfeeding, if exclusive and on demand, inhibits fertility. Combined hormonal contraceptives are contraindicated for breastfeeding women, due to their adverse effects on milk volume, duration of lactation, and therefore, on infant weight gain and health. Non-hormonal methods have no adverse effects on breastmilk production or infant health and are therefore appropriate for lactating women. While hormonal methods are not methods of first choice for breastfeeding women, progestin-only contraceptives, such as the progestin-only “mini-pill,” NORPLANT implants, and Depo-Provera are appropriate if, after counseling, such methods are preferred by women. Family planning and maternal and child health service providers must ensure that women are encouraged to breastfeed and provided with appropriate contraceptive advice and access to a range of contraceptive choices.

The “family planning among nursing mothers” indicator is intended to allow monitoring of contraceptive practices during this crucial time of life both for mother and child. Use of effective family planning methods by nursing mothers will allow optimal benefit to the child. Since breastmilk supply decreases if the mother becomes pregnant again while still nursing, use of effective contraception is crucial for the child’s health and nutritional status. If the mother wants more children, she, too, benefits from the use of effective contraception allowing her to experience a longer interval before becoming pregnant with the next child.

Dividing the family planning use among nursing mothers into different categories is done to allow an assessment of programs needed to help women choose a family planning method suited to their needs and reproductive intentions. In addition, programs may choose to show the percentage of women in some, or all, of the outlined subcategories to track changes in practices over time, and to assess the impact of specific interventions.

Nursing mothers using oral contraceptives should use the “mini-pill,” hence, there should be no one in category B1, since combined oral contraceptives are not recommended for lactating women because of the decrease in milk supply.

Women using traditional methods (category C3) should be counseled about effective methods of family planning, as should women who are non-users and who do not want to become pregnant (category D2).

The indicator can also be further refined according to time since delivery. This would facilitate comparison between groups that have different durations of breastfeeding, and over time (if breastfeeding durations change). The following time intervals are suggested: 0 - <6 months, 6 - <12 months, 12 - <24 months, 24 - <36 months, and 36 months and greater. Even when the indicator is shown according to time since delivery, it is recommended that the overall indicator be shown.



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A sample calculation of the percentage of women in each category according to time since delivery is shown below (using category A1 as an example):

percent (delivery 0 - <6 months ago) =

$$\frac{\text{\# of nursing mothers who delivered 0 - < 6 months ago, using IUD, tubal ligation or vasectomy}}{\text{total \# of nursing mothers}} \times 100$$

percent (delivery 6 - <12 months ago) =

$$\frac{\text{\# of nursing mothers who delivered 6 - <12 months ago, using IUD, tubal ligation or vasectomy}}{\text{total \# of nursing mothers}} \times 100$$

percent (delivery 12 - <24 months ago) =

$$\frac{\text{\# of nursing mothers who delivered 12 - <24 months ago, using IUD, tubal ligation or vasectomy}}{\text{total \# of nursing mothers}} \times 100$$

percent (delivery 24 - <36 months ago) =

$$\frac{\text{\# of nursing mothers who delivered 24 - <36 months ago, using IUD, tubal ligation or vasectomy}}{\text{total \# of nursing mothers}} \times 100$$

percent (delivery 36 or more months ago) =

$$\frac{\text{\# of nursing mothers who delivered 36 or more months ago, using IUD, tubal ligation or vasectomy}}{\text{total \# of nursing mothers}} \times 100$$

Contraceptive use among nursing women can also be ascertained among selected groups of women. Representative samples of specific population subgroups can be used. The indicator can also be calculated for participants in specific programs likely to have contact with nursing mothers, e.g., family planning programs, programs that promote good feeding practices among young children, and in well-baby clinics and immunization clinics.



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12b. ANY FAMILY PLANNING AMONG NURSING MOTHERS

DEFINITION

Use of any form of family planning or contraception among nursing mothers (see Indicator 12a for major categories of contraception).

MEASUREMENT

The indicator is calculated as a percentage distribution, with the number of breastfeeding women using any method of family planning as the numerator and all nursing mothers as the denominator.

$$\frac{\text{\# of nursing mothers using any family planning method (by category of time since delivery)}}{\text{total \# of nursing mothers (by category of time since delivery)}} \times 100$$

DATA REQUIREMENTS

1. A representative sample of nursing mothers.
2. Information on current contraceptive use.
3. Information about desire to become pregnant in the near future.
4. Age of infant/time since delivery, in order to do analysis according to the time postpartum. This is vital: i) to determine the proportion of mothers exclusively breastfeeding and experiencing amenorrhea even if they do not report LAM; ii) since breastfeeding patterns have variable impacts on fertility.

DATA SOURCE(S)

Population-based surveys employing representative samples (e.g., DHS surveys) should be used to estimate whether nursing mothers are using effective and appropriate contraceptive methods.

PURPOSE AND ISSUES

Breastfeeding women need to be protected from pregnancy in order to increase the spacing between births which benefits both their health and that of their infants. Exclusive breastfeeding has the greatest impact on fertility. Comparisons at different times postpartum of women who are using or



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not using family planning by their breastfeeding status can help program managers target those who are at especially high risk.



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The following is a summary of some of the key indicators used in this Tool Kit. It also shows other commonly-used terms and how these term relate to the indicators defined in this Tool Kit.

| Table 9. Comparison of Commonly Used Breastfeeding Indicators | | | | |
|---|--|--|--|--|
| Categories of Infant Feeding | Requires that the infant receive: | Allows the infant to receive: | Does not allow the infant to receive: | Additional criteria/ comments: |
| <i>Exclusive breastfeeding</i> (WHO definition) | Breastmilk, (including milk expressed or from wet nurse) | Drops, syrups (vitamins, minerals, medicines) | Anything else | |
| <i>Predominant breastfeeding</i> (WHO definition) | Breastmilk (including milk expressed or from wet nurse) as the predominant or main* source of nourishment. | Liquids (water, and water-based drinks, fruit juice, ORS), ritual fluids and drops or syrups (vitamins, minerals, medicines) | Anything else (in particular, non-human milk, food-based fluids) | *Allows any amount of liquids as defined. |
| <i>Full breastfeeding</i> (WHO definition) | | | | Includes the following categories: <i>exclusive breastfeeding</i> and <i>predominant breastfeeding</i> |
| <i>Full breastfeeding</i> (see Schema, pg. A-29)-- includes: a. <i>Exclusive breastfeeding</i> b. <i>Almost exclusive breastfeeding</i> | Breastfeeding Breastfeeding | Vitamins, minerals, water, juice, or ritualistic feeds | | Substances other than breastmilk must be given "infrequently" |
| <i>Full breastmilk feeding</i> a. <i>Exclusive breastmilk feeding</i> | Breastmilk, not necessarily from the breast | | | |



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| | | | | |
|---|---|---|--|--|
| <i>b. Almost exclusive breastmilk feeding</i> | Breastmilk, not necessarily from the breast | Vitamins, minerals, water juice, or ritualistic feeds | | Substances other than breastmilk must be given “infrequently” |
| <i>Full or nearly full breastfeeding</i> (see Schema, pg. A-29) | | | | At least 85% of feeds must be breastfeeds; supplementation must not exceed 15% of all feedings and no intervals >4 hours (daytime) or >6 hours (nighttime between feeds.** Includes the following categories: <i>exclusive, almost exclusive, and high partial</i> |
| <i>Partial breastfeeding</i> (see Schema, pg. A-29) -- includes: <i>a. High partial</i> <i>b. Medium partial</i> <i>c. Low partial</i> | >80-85% of feeds are breastfeeds** About half of all feeds are breastfeeds** <15-20% of feeds are breastfeeds** | | | |
| <i>Token breastfeeding</i> (see Schema, pg. A-29) | Minimal, occasional breastfeeds primarily for comfort | | | Few than 15% of feeds are breastfeeds** |

** The term, “feeds,” needs a culturally appropriate definition.



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APPENDIX 5. SAMPLE QUESTIONNAIRES

MADLAC Form in English

MADLAC Form in Spanish

WHO Sample Questions for Use in Surveys on Breastfeeding Indicators

DHS Breastfeeding Questions



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WHO SAMPLE QUESTIONS FOR USE IN SURVEYS ON BREASTFEEDING INDICATORS

(Adapted from (6))

Date of interview.....

For each child less than 24 months old ask the respondent:

1. Can you tell me how old this child is today?
(If possible, the exact date of birth is.....)

2. Since this time yesterday, has (name) been breast-fed? Yes No
If yes, was this (name)'s main source of food? Yes No

3. Since this time yesterday, did (name) receive any of the following:

| | | |
|---|-----|----|
| - Vitamins, mineral supplements, medicine | Yes | No |
| - Plain water | Yes | No |
| - Sweetened or flavored water | Yes | No |
| - Fruit juice | Yes | No |
| - Tea or infusion | Yes | No |
| - Infant formula | Yes | No |
| - Tinned, powdered or fresh milk | Yes | No |
| - Solid or semi-solid food | Yes | No |
| - Oral Rehydration Salts (ORS) solution | Yes | No |
| - Other (specify:) | Yes | No |

4. Since this time yesterday, did (name) drink anything from a bottle with a nipple/teat? Yes No
If yes, please describe:
.....



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DHS BREASTFEEDING QUESTIONS (from (13))



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APPENDIX 6. BREASTFEEDING INDICATORS DATA

Table 10. *State of the World's Children 1995*. Table 2. Nutrition

Table 11. Percentage of Children Never Breastfed



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Table 11. Percentage of Children Never Breastfed

Among all children born in the last three/five years before the survey, the percentage who were never breastfed (personal communication, Elisabeth Sommerfelt, MACRO International, Demographic and Health Surveys).

| Country and year of survey | % never breastfed |
|-----------------------------|-------------------|
| Botswana 1988 | 5 |
| Burkina Faso 1992-93 | 3 |
| Burundi 1987 | 3 |
| Cameroon 1991 | 3 |
| Ghana 1988 | 5 |
| Ghana 1993 | 3 |
| Kenya 1989 | 4 |
| Kenya 1993 | 4 |
| Liberia 1986 | 5 |
| Madagascar 1992 | 3 |
| Malawi 1992 | 4 |
| Mali 1987 | 6 |
| Namibia 1992 | 6 |
| Niger 1992 | 3 |
| Ondo State, Nigeria 1986-87 | 1 |
| Nigeria 1990 | 4 |
| Rwanda 1992 | 3 |
| Senegal 1986 | 5 |
| Senegal 1992-93 | 3 |
| Sudan 1989-90 | 4 |
| Tanzania 1991-92 | 3 |
| Togo 1988 | 5 |
| Uganda 1988-89 | 3 |
| Zambia 1992 | 3 |



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| | |
|--------------------------|----|
| Zimbabwe 1988-89 | 3 |
| Egypt 1992 | 6 |
| Jordan 1990 | 6 |
| Morocco 1987 | 7 |
| Morocco 1992 | 5 |
| Tunisia 1988 | 5 |
| Turkey 1993 | 5 |
| Indonesia 1987 | 5 |
| Indonesia 1991 | 3 |
| Pakistan 1990-91 | 7 |
| Philippines 1993 | 13 |
| Sri Lanka 1987 | 3 |
| Thailand 1987 | 6 |
| Bolivia 1989 | 4 |
| Brazil 1986 | 14 |
| Brazil (Northeast) 1991 | 10 |
| Colombia 1986 | 8 |
| Colombia 1990 | 7 |
| Dominican Republic 1986 | 11 |
| Dominican Republic 1991 | 8 |
| Ecuador 1987 | 9 |
| El Salvador 1985 | - |
| Guatemala 1987 | 6 |
| Mexico 1987 | 17 |
| Paraguay 1990 | 7 |
| Peru 1986 | 8 |
| Peru 1991-92 | 4 |
| Trinidad and Tobago 1987 | 13 |



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APPENDIX 7

Table 12. Sample Size Requirements for Different Prevalence Levels in Cross-Sectional Studies (taken from (5))

| Prevalence of Interest | Absolute Level of Precision (95% c.i.) | Required Sample Size |
|------------------------|--|----------------------|
| 5% | 1% (4%-6%) | 1,825 |
| 5% | 2.5% (2.5%-7.5%) | 292 |
| 10% | 2.5% (7.5%-12.5%) | 553 |
| 10% | 5% (5%-15%) | 138 |
| 15% | 5% (10%-20%) | 196 |
| 15% | 7.5% (7.5%-22.5%) | 87 |
| 20% | 5% (15%-25%) | 288 |
| 20% | 10% (10%-30%) | 249 |
| 25% | 5% (20%-30%) | 61 |
| 25% | 10% (15%-35%) | 72 |
| 30% | 10% (20%-40%) | 69 |
| 35% | 10% (25%-45%) | 87 |
| 35% | 15% (20%-50%) | 39 |
| 50% | 10% (40%-60%) | 96 |
| 50% | 15% (35%-65%) | 43 |
| 65% | 10% (55%-75%) | 87 |
| 65% | 15% (50%-80%) | 39 |
| 70% | 10% (60%-80%) | 69 |
| 75% | 5% (70%-80%) | 288 |
| 75% | 10% (65%-85%) | 72 |
| 80% | 5% (75%-85%) | 249 |
| 80% | 10% (70%-90%) | 61 |
| 85% | 5% (80%-90%) | 196 |
| 85% | 7.5% (77.5%-92.5%) | 87 |
| 90% | 2.5% (87.5%-92.5%) | 553 |



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| | | |
|-----|--------------------|-------|
| 90% | 5.0% (85%-95%) | 138 |
| 95% | 1% (94%-96%) | 1,825 |
| 95% | 2.5% (92.5%-97.5%) | 292 |



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APPENDIX 8 LAM ALGORITHM



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APPENDIX 9

Illustration of the Use of Indicator 9 (Full/Partial/Token Breastfeeding) for Assessing Breastfeeding Program Impact

It has been suggested that sentinel sites or surveys can be used to monitor the impact of breastfeeding interventions. IRH has recommended the use of the Schema for the Definition of Breastfeeding (see Indicator 9. Full/Partial/Token Breastfeeding) and the following matrix for assessing behavior change over time in a community, country or region, through sentinel site assessment or survey. A shift in the direction of more exclusive or nearly exclusive breastfeeding among infants in each month up to month six, or among all infants less than six months old, depending on whether seasonality is an issue, would be the measure of behavior change.

Number (Percent) of Population 0 - <6 months old (or 0 - <2 months, 2 - <4 months), (4 - <6 months) Experiencing Indicated Breastfeeding Pattern

| Date | Full Breastfeeding | | Partial Breastfeeding | | | Token | None |
|------|--------------------|------------------|-----------------------|--|-------------|-------|------|
| | Exclusive | Nearly Exclusive | High Partial | | Low Partial | | |
| | | | | | | | |
| | | | | | | | |

The following is an example of how the data may look, assessing point-in-time behaviors for all infants less than six months old at the sentinel reporting site or survey, at specific points in time. Figures may be grouped for statistical analysis, depending on the thrust of the program.

Number (Percent) of Population 0 - <6 Months Experiencing Indicated Breastfeeding Pattern

| Date | No. of Infants | Full Breastfeeding | | Partial Breastfeeding | | | Token n (%) | None n (%) |
|------|----------------|--------------------|------------------------|-----------------------|---------|-------------------|-------------|------------|
| | | Exclusive n (%) | Nearly Exclusive n (%) | High Partial n (%) | n (%) | Low Partial n (%) | | |
| 7/94 | 120 | 0 (0) | 0 (0) | 15 (12.5) | 50 (42) | 20 (17) | 5 (4) | 10 (8) |
| 1/95 | 110 | 0 (0) | 5 (4.5) | 15 (14) | 45 (41) | 20 (18) | 5 (4.5) | 5 (4.5) |
| 7/95 | 135 | 0 (0) | 9 (7) | 20 (15) | 45 (33) | 20 (15) | 0 (0) | 5 (4) |
| 1/96 | 112 | 5 (4) | 12 (11) | 18 (16) | 40 (36) | 20 (18) | 2 (2) | 15 (13) |
| 7/96 | 128 | 10 (8) | 10 (8) | 15 (12) | 35 (27) | 30 (23) | 10 (8) | 18 (14) |



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This hypothetical example illustrates the real possibility that exclusive or nearly exclusive (full) breastfeeding may increase while at the same time the complete picture of breastfeeding patterns is deteriorating (i.e. the percent of infants with undesirable breastfeeding patterns -- none, token, and low partial in this example -- also increases).



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