

DEVELOPING STANDARD INDICATORS AND MEASUREMENTS OF BREASTFEEDING PRACTICES

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Abstrak. Pemberian ASI memberikan keuntungan bagi bayi juga ibunya. Bayi harus diberikan ASI eksklusif sampai usia 6 bulan, kemudian diteruskan sampai usia 2 tahun dengan disertai makanan pendamping ASI untuk mendapatkan manfaat yang optimal. Pemberian ASI perlu ditingkatkan dan menjadi salah satu target program promosi kesehatan. Akan tetapi data tentang pemberian ASI sangat beragam dan terkadang memiliki indikator dan cara pengukuran yang berbeda, sehingga data sulit dibandingkan satu dengan lainnya. Perlu adanya indikator dan cara pengukuran yang terstandar sehingga data yang didapat dapat dibandingkan satu dengan lainnya. Hasil konsensus menetapkan 6 indikator kunci yang sangat berguna dalam penilaian program dan evaluasi pemberian ASI yaitu persentase pemberian ASI eksklusif; pemberian ASI sebagai makanan utama bayi; waktu pemberian makanan pendamping ASI; pemberian ASI sampai usia 1 tahun; pemberian ASI sampai umur 2 tahun; dan pemberian susu botol. Definisi, indikator dan cara pengukuran pemberian ASI yang konsisten dan baik akan dapat meningkatkan kualitas perbandingan data baik antar daerah atau negara. Badan Kesehatan Dunia (WHO) menganjurkan penggunaan indikator dan metode khusus pengukuran pemberian ASI yang berdasarkan data status terkini. Penelitian longitudinal diperlukan untuk mendapatkan data yang lebih dalam berkaitan dengan informasi pemberian ASI pada program promosi kesehatan.

Kata kunci: pemberian ASI, indikator dan standar pengukuran

As a consensus, there are six key indicators which are the most useful for program assessment and evaluation (WHO 1991): 1) exclusive breastfeeding rate; 2) predominant breastfeeding rate; 3) timely complementary feeding rate; 4) continued breastfeeding rate (1 year); 5) continued breastfeeding rate (2 years); and 6) bottle feeding rate. In addition, the WHO also recommended several optional key indicators including ever breastfed rate, timely first-suckling rate, median duration of breastfeeding, and exclusive breastfeeding rate by mothers. These are described below.

Breastfeeding is very important for infants and for the health of mothers. Infants should be fed exclusively on breastfeeding from birth to six months of age, followed by breastfeeding with safe and healthy complementary foods up to two years to get optimum advantages (WHO 2004).

Breastmilk provides short term and long-term health gains for infants. In particular: a) specific nutrients to meet the nutritional requirements of the human infant (Secker & Zlotkin 1998; Binns & Davidson 2003; Butte, Lopez-Alarcon & Garza 2002); b) associated with higher

developmental status (Lucas et al. 1992; Anderson, Johnstone & Remley 1999; Lucas et al. 1990) and maternal-infant bonding (Black & Hylander 2000); c) morbidity and mortality prevention associated with infectious diseases (Kramer, Chalmes & Hodnett 2001; Molbak et al. 1994; Onnela 1997; Betran et al. 2001) and diarrhoeal disease (Yoon, Black & Moulton 1996; Onnela 1997; Molbak et al. 1994); d) acute respiratory infections prevention (Wilson et al. 1998) and pneumonia (Cesar et al. 1999); and e) prevent obesity and risk of chronic diseases (Armstrong, Reilly & Team 2002; Kries et al. 1999).

In addition, breastfeeding may offer several advantages for the breast feeding mother, such as: a) an earlier return to pre pregnant weight (Kramer & Kakuma 2002; Dewey, Heinig & Nommsen 1993); b) a possibly reduced risk of breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer 2002) and ovarian cancer (Zhang, Lee & Binns 2002); and an appropriate method to control fertility (Tommaselli et al. 2000). Finally, breastfeeding provides significant social and economic benefits, including saved money, reduced health care costs and reduced employee absenteeism for care attributable to child illness (American Academy of Pediatrics Work Group on Breastfeeding 1997; UNICEF 1999).

Attitudes towards breast-feeding, awareness of the importance of breast-feeding, and support to enable mothers

to breast-feed are all important outcomes of promotional activities in health programmes (WHO 1991). However, they may also be difficult to measure and/or interpret and may not reflect actual practice (WHO 1991).

There are many difficulties in collecting accurate breastfeeding data. Many studies have discussed data collection methods for breastfeeding practices. Overall the debate is between retrospective and longitudinal data. Retrospective data relies on maternal recall, which may be fallible in detail over time. Various authors have pointed out the difficulties in interpreting the results of breastfeeding studies because of the different methods and breastfeeding used (Aarts et al. 2000). Consistent and valid definitions of breastfeeding are needed to ensure accurate conclusions, to increase comparability of data collected from several countries or region, to improve communication between programs and to increase usefulness of research presentation (Labbok & Krasovec 1990). This article will discuss a set of key indicators and measurement methods as the basis for a system to monitor breastfeeding trends. This information will serve as a basis for developing a specific set of recommendations that could be implemented into breastfeeding rates measurements.

Methodology

To address the issue of breastfeeding indicators and measurements, a compre-

hensive literature review has been conducted. Information is collected from reports, peer reviewed publications and other relevant literature. In addition, the WHO breastfeeding indicators and specific methodology for their measurements will be adapted as models to propose a set of breastfeeding indicator and measurements in Indonesia.

International definitions of breastfeeding

Many studies of breastfeeding have failed to apply consistent definitions of breastfeeding practices. For instance, the studies have not adequately distinguished between full and partial breastfeeding (Labbok & Krasovec 1990). In their study in developing countries, (Labbok & Krasovec 1990) noted many researchers have included non-nutritive supplements in their definition of exclusive breastfeeding. This lack of precision and consistency in the definition of breastfeeding has led to misinterpretation of data and problems with comparability between studies. Thus implementing consistent and valid definitions of breastfeeding is important because: 1) ensures accurate conclusions by policymakers; 2) increases comparability of data collected from several countries or regions; 3) improves communication between programs; and 4) increases usefulness of research presentation (Labbok & Krasovec 1990). In 1998, the Interagency Group for Action on Breastfeeding had met to develop a

set of breastfeeding definitions. The development of a schema and framework for defining breastfeeding was prompted (Labbok & Krasovec 1990) and is illustrated in figure 1. In the schema, breastfeeding is classified into two major categories including *full* and *partial breastfeeding*. *Full breastfeeding* is subdivided into *exclusive breastfeeding* and *almost exclusive*. *Exclusive breastfeeding* is defined strictly as infant gets only breastmilk, no other liquid including water or solid foods. *Almost exclusive breastfed* infants may receive additional water only. The authors noted that the differentiation of the definition of breastfeeding is important, because even the addition of water alone may increase the risk of diarrhea (Labbok & Krasovec 1990). Thus it is necessary to distinguish between exclusive and almost exclusive breastfeeding.

Partial breastfeeding is subdivided into three substantial feeding including *high*, *medium* and *low*. These categories may be determined by the proportion of breastfeeding consumed or by percent of energy provided by breastfeeding. *Token breastfeeding* infants only get breastfeeding minimal, occasional and irregular. The breast is not for major nutritive purposes, but only for child comfort and consoling (Labbok & Krasovec 1990).

As a follow up of the Labbok and Krasovic schema, (WHO 1991) recommends the definitions of key

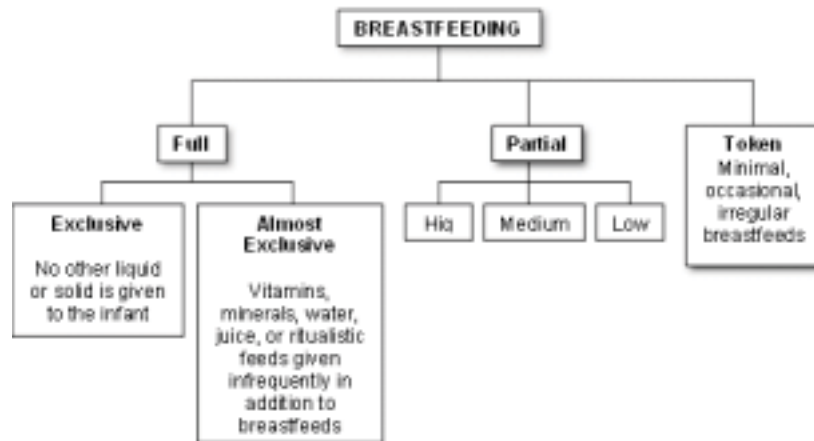


Figure 1
Schema for breastfeeding definitions
Source: (Labbok & Krasovec 1990)

breastfeeding indicators and specific methodologies for their measurement for international use. Most of the WHO set of breastfeeding definitions is essentially the same as those describe in the Labbok and Krasovic schema. There are, however, several differences: 1) a change in terminology from *almost exclusive* to *predominant*; 2) the acceptance of drops or syrups in the category *exclusive breastfeeding*; and 3) the acceptance of certain liquids and ritual fluids in limited amounts, in the category *predominant breastfeeding* (WHO 1991).

The WHO definitions and the criteria for specific breastfeeding categories are summarized in table 1. A summary of infants feeding categories in developing the indicators is presented in Table 2.

Measuring Indicators of Breastfeeding Practices

The WHO held an informal meeting at 11-12 June 1991 to reach a consensus on

the definitions of key breastfeeding indicators and specific methodologies for their measurements (WHO 1991). This can be used to assess breastfeeding practices and evaluate the progress of promotional programmes. There are several considerations in the indicators including: 1) simple (limited in number), easy to measure and interpret, and easy to use (operational); 2) suitable on intra country comparison; and 3) able to monitor requirements of the goals and policies on breastfeeding promotion (WHO 1991).

Selection of age groups for measuring breastfeeding

The WHO recommendation of age groups for the purpose of measuring indicators has been classified into four age groups: 1) Exclusive breastfeeding and predominant breastfeeding are measured in infants up to age 6 months (<180 days); 2) Timely complementary

Table 1
Definitions of breastfeeding categories

Category	Definition
Exclusive breastfeeding	Means the infant has received only breastmilk from his/her mother or a wet nurse, or expressed breastmilk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines
Predominant breastfeeding	The infant's predominant source of nourishment has been breastmilk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc.); fruit juice; Oral Rehydration Salts (ORS) solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). With the exception of fruit juice and sugar-water, no food-based fluid is allowed under this definition.
Full breastfeeding	Exclusive breastfeeding and predominant breastfeeding together constitute full breastfeeding
Breastfeeding	The child has received breastmilk direct from the breast or expressed
Complementary feeding	The child has received both breastmilk and solid or semi-solid food.

Source : WHO, 1991

Table 2
The WHO criteria for inclusion in infant feeding categories

Category of infants feeding	Requires that the infant receive	Allows the infant to receive	Does not allow the infant to receive
Exclusive breastfeeding	Breastmilk (including milk expressed or from wet nurse)	Drops, syrups (vitamin, minerals, medicines)	Anything else
Predominant breastfeeding	Breastmilk, including expressed breastmilk or from wet nurse, as the predominant source of nourishment	Liquids including water, and water-based drinks, fruit juice, ORS, ritual fluids and drops or syrups (vitamin, minerals, medicines)	Anything else (in particular, non human milk, food-based fluids)
Complementary feeding	Breastmilk and solid or semi solid foods	Any food or liquid including non-human milk	
Breastfeeding	Breastmilk	Any food or liquid including non-human milk	

Source : WHO, 1991

feeding is measured in infants older than exact age 6 months but less than exact age 10 months (180-299 days); 3) Continued breastfeeding is measured in children one year old at which age groups older than exact age 12 months but less than exact age 16 months; 4) Continued breastfeeding in children nearing the end of their second year of life, the age groups older than exact age 20 months but less than exact age 24 months.

Methodology for measuring indicators

Interviews at the household level. WHO notes that sampling of households and/or individuals within households meet the preferred criteria to obtain representative national data about breastfeeding. This design has been commonly used in developing countries to obtain health-related data from households. Demographic Health Surveys (DHS) are used as the main survey 'vehicles' on which breastfeeding data are collected. These surveys provide standardized methods for household sampling, questionnaire content and administration, and protocols for training interviewers (Webb et al. 2001).

All live children less than 24 months of age. The WHO indicator prescribe a sampling frame include all children born in a given time period in household aged less than 2 years or not yet having had their second birthday. The indicator uses all children born during a specified time period in order to be representative of the population of children.

Based on *current status* data (24-hours recall period for feeding practices). The WHO breastfeeding indicators require the collection of data relating to current feeding practices, i.e., the current information during 24 hours prior the survey. The 24-hour recall period for feeding practices has been widely used and found appropriate in surveys of dietary intake.

Definitions of Key Indicators

As a consensus, there are six key indicators which are the most useful for program assessment and evaluation (WHO 1991): 1) exclusive breastfeeding rate; 2) predominant breastfeeding rate; 3) timely complementary feeding rate; 4) continued breastfeeding rate (1 year); 5) continued breastfeeding rate (2 years); and 6) bottle feeding rate. In addition, the WHO also recommended several optional key indicators including ever breastfed rate, timely first-suckling rate, median duration of breastfeeding, and exclusive breastfeeding rate by mothers. These are described below.

Main key indicators (adopted from WHO)

Exclusive breastfeeding rate. Exclusive breastfeeding rate is defined as proportion of infants less than 6 months of age who are exclusively breastfed. Previously, the WHO recommended breastfeeding from 4 to 6 months of age. The indicator has been changed to up to 6 months of age (WHO 2001).

All infants should get breastmilk from birth to six months of age. The indicator of exclusive breastfeeding rate includes breastfeeding from a wet nurse and feeding on expressed breastmilk. The breastfeeding information is derived from a 24-hour recall period. This method, however, might cause the proportion of exclusively breastfed infants to be slightly overestimated. For example, infants who are given other liquids irregularly may not have received them in the 24 hours before the survey.

Predominant breastfeeding rate. Predominant breastfeeding rate is defined as proportion of infants less than 6 months of age who are predominantly breastfed (previously less than 4 months of age). This indicator has been considered important because exclusive breastfeeding for infants may be very low. Therefore, this indicator attempts to identify infants whose predominant source of nourishment is breastmilk, but who also receive other fluids.

Timely complementary feeding rate. Complementary foods should be introduced gradually to infants after 6 months of age while continuing breastmilk up to two years of age to provide sufficient nutritious for their needs. In addition of breastmilk, all infants after 6 months of age should receive solid and/or semi solid complementary (weaning) foods. It is important to note that the complementary foods should contain adequate nutrients to provide infant's needs.

To calculate the rate, all infants who are breast-fed and are receiving solid/semi solid foods are included in the numerator of this indicator.

Continued breastfeeding rate (1 year). Proportion of children 12-15 months of age who are breastfeeding. The continued breastfeeding rate gives indication of breastfeeding beyond one year.

Continued breastfeeding rate (2 years). Proportion of children 20-23 months of age who are breastfeeding. Children should receiving appropriate complementary foods after 6 months and continue to be breastfed for up to two years of beyond. This indicator is important to measure the proportion of children who are still breastfeeding at one and two years of age and gives an indication of breastfeeding practices towards the end of the second year of life.

Optional additional indicators (adopted from WHO)

Some programmes may wish to measure additional indicators. There are including: ever breast-fed rate, timely first-suckling rate, and median duration of breastfeeding.

Ever breastfed rate. Proportion of infants less than 12 months of age who were ever breast-fed. This indicator is useful to identify the percentage of mothers who have attempted to supply breastmilk to their infants.

Timely first-suckling rate. Proportion of infants less than 12 months of age who first suckled within one hour of birth.

Table 3
Summary Lists of Main Key Breastfeeding Indicators

Definition	Key Indicators
Exclusive breastfeeding rate	Infants < 6 months (180 days) of age who were exclusively breastfed in the last 24 hours Infants <6 months (<180 days) of age
Predominant breastfeeding rate	Infants <6 months (180 days) of age who were predominantly breastfed in the last 24 hours Infants <6 months (<180 days) of age
Timely Complementary Feeding Rate	Infants 6-9 months (180-299 days) of age who received complementary foods in addition to breastmilk in the last 24 months Infants 6-9 months (180-299 days) of age
Continued Breastfeeding Rate (1 year)	Children 12-15 months of age who were breastfed in the last 24 months Children 12-15 months of age
Continued Breastfeeding Rate (2 year)	Children 20-23 months of age who were breastfed in the last 24 months Children 20-23 months of age

Source : WHO, 1991

Median duration of breastfeeding. The median duration of breastfeeding is defined as the age (in months) when 50% of children are no longer breast-fed. The indicator is based on current status data among all living children less than 3 years of age. There are several steps for the calculation. The first is to determine the proportion of all living children in each single-month age group who are still breast-feeding. Secondly, is to smooth these data by calculating a 3-month moving average.

Breastfeeding Measurements and Their Definitions Used in the South East Asia Region Studies

Studies of infants feeding practices in the South East Asia Region have used a range breastfeeding definitions.

Many studies have not outlined breastfeeding definitions clearly, and some studies have given no breastfeeding definitions at all. It is important to note that several studies used different definitions of breastfeeding, although WHO had recommended standard breastfeeding definitions and measurements in 1991.

This should be a concern, since lack of consistent breastfeeding definitions may reduce the reliability and comparability of the study (Labbok & Krasovec 1990). Even minimal supplements may have an effect on morbidity, nutritional status, and mortality in infants (Labbok & Krasovec 1990). It is also suggested that inconsistent and ambiguous definitions of breastfeeding have resulted in contradic-

tory conclusions in relation to the effect of breastfeeding on infant health, growth and development (McIntyre 1998).

Labbok & Krasovec (1990) have proposed the schema and framework for breastfeeding definitions which may assist researchers and agencies in their efforts to accurately describe and interpret breastfeeding practices. The WHO refined the definitions in 1991 and recommended a set of breastfeeding definition and specific methodology for their measurements (WHO 1991).

The WHO developed sample questions for use in surveys on breastfeeding indicators to monitor breastfeeding practices (Box 1). The questions are developed based on current feeding data, during the 24 hours prior the survey.

From these questions, rates for most of WHO breastfeeding indicators can be calculated. The WHO questions would provide most of the required data elements for the proposed indicators relating to intensity of current breastfeeding. There are, however, additional questions required to assess the proportion who recall ever breastfeeding, and the total duration of breastfeeding (Webb et al. 2001).

In the South East Asia Region, most countries have used the DHS questionnaire for breastfeeding survey. The standard *DHS+* survey consists of a household questionnaire and a women's questionnaire. A nationally representative sample of women age 15–49 is interviewed.

Box 1
WHO Sample questions for breastfeeding surveys

Can you tell me how old the child is today?	YES	NO
If possible, the exact date of birth is		
Since this time yesterday, has (name) been breastfeeding?	YES	NO
If yes, was this (name)'s main source of foods?		
Since this time yesterday, did (name) receive any of the following:		
Vitamins, mineral supplements, medicine	YES	NO
Plain water	YES	NO
Sweetened or flavoured 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	YES	NO
Other (specify.....)	YES	NO

Source : WHO, 1991

Breastfeeding and nutrition questions are included in the women's questionnaire that covers feeding practices, the length of breastfeeding, and children's consumption of liquids and solid food. Special modules can also be added to questionnaires in order to meet host-country and USAID data needs. The survey instruments are translated into local languages, pretested, and finalized.

It can be said that the DHS breastfeeding questionnaire is in consistent with the WHO breastfeeding questionnaire, although there are some modifications on its implementation between countries. Example of the questionnaire can be seen in Box 2.

Box 2

The DHS Questionnaire for Breastfeeding Practices in the South East Asia Region

- | | |
|---|---|
| 1. Did you ever breastfeed (CHILD'S NAME)? | Yes
No |
| 2. Why did you not breastfeed (NAME)? | Child died
Child ill/weak
Mother ill/weak
Nipple/breast problem
No milk
Mother working
Child refused
Keeping breast beautiful
Other |
| 3. How long after birth did you first put (NAME) to the breast? | Hours.....
Days..... |
| 4. Are you still breastfeeding (NAME)? | Yes
No |
| 5. How many months did you breastfeed (NAME)? | Months.....
Don't know |
| 6. Why did you stop breastfeeding (NAME)? | Child died
Child ill/weak
Mother ill/weak
Nipple/breast problem
No milk
Mother working
Child refused
Weaning age
Start using contraception
Other |

Problems with measuring indicators of breastfeeding rates

Many studies have suggested that maternal recall on collecting breastfeeding information is accurate (Launer et al. 1992; Tienboon, Rutishauser & Wahlqvist 1994). In a study of 318 Bedouin Arab women,

(Launer et al. 1992) compared data from interviews conducted 12 and 18 months with data collected at 6 months postpartum. The study suggests that retrospective data of infant feeding which was collected based on maternal recall up to 18 months in the past is accurate. The data can be used with confidence in

Continue box 2

8. How many times did you breastfeed last night between sunset and sunrise?	Number of nighttime feeding
9. How many times did you breastfeed yesterday during the daylight hours?	Number of daylight feeding
10. Was (NAME) given a specifier yesterday or last night?	Yes No Don't know
11. Did (NAME) drink anything from a nipple yesterday or last night?	Yes No Don't know
12. At any time yesterday or last night was (NAME) given any of the following:	
* Plain water?	
* Honey/diluted honey?	
* Fresh milk?	
* Any other liquids such as sugar water, tea, coffee, carbonated drinks, or soup broth?	
* Any food made from wheat, maize, rice, sorghum (OR LOCAL GRAIN) such as.....?	
* Any food made from pumpkins, carrots, red sweet potatoes, green leafy vegetables, mango, papaya?	
* Any other food made from cassava, plaintain, yams (OR LOCAL TUBER) such as.....?	
* Any other fruits and vegetables (e.g. bananas, apples, avocados, tomatoes)?	
* Meat, eggs, fish, poultry, cheese, or yoghurt?	
* Any food made from legumes (e.g. lentils, beans, soybeans, pulses, or peanuts)?	
* Any food made with oil, fat, or butter?	
* Any other solid or semi-solid foods?	

Source: DHS (www.measuredhs.com)

epidemiological studies. However, the period of time at which mother can recall the information accurately should be considered. The accuracy of data may decrease as length of recall increase (Launer et al. 1992).

Similarly, Tienboon, Rutishauser & Wahlqvist (1994) suggest that maternal recall of infant feeding practices even after an interval as long as 14 years was a valid measure to determine retrospectively breastfeeding initiation rates. This is of particular for first and second-born children and for those breastfed for longer than one month. The study found that maternal recall of the initial method of feeding was in agreement with data available from infant welfare center records for 85% of the mothers. The sensitivity of maternal recall of breastfeeding was 82% and the specificity of the recall was 93%.

However, maternal recall of timing of the introduction of solids and estimation of the duration of breastfeeding was less good between 60% and 70% agreement. It is also important that the recall was not a valid measure of the initial method of feeding for mothers who had breastfed their infants for less than one month, since only 65% of these mothers recalled breastfeeding their infants after this interval of time.

Conversely, Aarts et al. (2000) found a wide discrepancy between the 24-hour recall ('current status') at 2, 4 and 6 months of age and the pattern obtained by analyzing the infant feeding data for

every day up to these different ages, starting from birth. A prospective study was used in which 506 mother-infant pairs were included (Aarts et al. 2000). The study compared the breastfeeding pattern that emerged by analysing infant feeding data obtained from Swedish mothers from a single 24-hour period ('current status') at 2, 4 and 6 months of age, with the pattern obtained by analysing the infant feeding data for every day up to these different ages, starting from birth. The study found a wide discrepancy between the results obtained from the two analyses. The difference in the exclusive breastfeeding rate was over 40 percentage points at both 2 and 4 months of age (92% versus 51% at 2 months and 73% versus 30% at 4 months) and 9 percentage points at 6 months (11% versus 18%).

Bland et al. (2003) also suggests using the prospective method of collecting breastfeeding practices. In their study, Bland et al. (2003) compared different recall methods of (duration of) exclusive breastfeeding (EBF) including 48 hour recall, seven day recall and both the weekly and thrice weekly recall obtained from the structured interviews, in the same cohort of women in which the WHO definitions of early infant feeding were consistently applied. They found that mothers overestimate the duration of exclusive breastfeeding in which 48-hour EBF status does not accurately reflect feeding practices since birth.

Long term recall data on EBF are even more inaccurate. They propose that data on duration of exclusive breastfeeding should be collected prospectively at intervals of no longer than one week (Bland et al. 2003).

It is important to recognize that retrospective reports of feeding practices recalled can measure relatively accurate for indicators of any breastfeeding ('ever breastfed'). However, the indicators of exclusive breastfeeding and the timing of introduction of complementary foods are unlikely to be sufficiently accurate collected by recalled practice. Thus prospective studies have been proposed to provide more accurate information of the indicators.

The WHO recommends the collection of current breastfeeding practices using the 24-hour recall period before the survey. This method may minimize error from recalled practices (retrospective) (Webb et al. 2001). Since, prospective studies may take time consumed and need more other resources, the '*current status data*' has been selected in the WHO set of indicators and measurement because it has been widely used and found appropriate in surveys of dietary intake, particularly in developing countries (WHO 1991). However, some infants may be misclassified as exclusively breastfed for the entire period between birth and 6 months of age when they have been given other liquids or foods at least once by the age.

This is because of infant feeding behaviour is not constant from day to day (WHO 2003). In addition, occasionally need longitudinal survey to provide more reliable data and for a more detailed information for the health promotion programs (Colin Binns, personal communication).

Proposed indicators and measurements breastfeeding

The WHO indicators and definitions have been widely used in developing countries. For instance, most surveys using the DHS (USAID) on breastfeeding practices may have followed the WHO recommendation, although there are several modifications in its implementation in order to meet host-country and USAID data needs. Based on the DHS data, breastfeeding information has been collected from all children born in the five years before the survey. The mothers were asked about breastfeeding practices, e.g. how soon after birth the baby was given breastmilk, whether the child was given something other than breastmilk. From that, data on initial breastfeeding has been collected including percentage of children who were ever breastfed, the percentage who started breastfeeding within one hour and percentage who received others then breastmilk. The categories of breastfeeding, exclusive breastfed, breastfeeding and consuming plain water, water-based liquids/juice, other milk, and complementary foods (solids and semi-

solids) are based on a 24-hour recall period before the survey amongst children under three years of age.

It is of important to consider the methods of breastfeeding measurement and indicators to provide more accurate data. It is suggested that mothers are able to accurately recall over several years whether they ever breastfed and the duration of breastfeeding (Webb et al. 2001). Thus 'percent ever breastfed' and 'median duration of breastfeeding among 'ever breastfed' children may be measured based on recalled practices, and may be taken from samples of children less than four years of age (Webb et al. 2001).

Evidence suggests that it is difficult for mothers to recall with precision the age at which solids and other complementary foods were introduced. Therefore it is recommended that exclusive breastfeeding and complementary foods are measured based on current data (24 hours before the survey) and be sampled should rely on no more than 12 months of recall to get more accurate data. According to (Webb et al. 2001), exclusive breastfeeding and complementary foods information could be collected from children aged less than six months.

The indicators are: a) Percent exclusively breastfed to 6 months; b) Percent predominantly breastfed to 6 months; c) Percent fully breastfeeding (exclusively plus predominantly) to 6 months; d) Indicators based on mothers' reported current practice (previous 24 hours).

Conclusion and Suggestion

Breastfeeding is very important for infants and for the health of mothers. Exclusive breastfeeding until around six months and continued by breastfeeding with nutritionally adequate and safe complementary foods for up to two years or beyond is the optimal food pattern for infant and of value to mother, although the maximum benefits of breastfeeding are in the earliest months of life.

It is important to have consistent and valid definitions of breastfeeding to increase comparability of data collected from several countries or region. There are six key indicators which are the most useful for program assessment and evaluation including 1) exclusive breastfeeding rate; 2) predominant breastfeeding rate; 3) timely complementary feeding rate; 4) continued breastfeeding rate (1 year); 5) continued breastfeeding rate (2 years); and 6) bottle feeding rate. In addition, the WHO also recommended several optional key indicators including ever breastfed rate, timely first-suckling rate, median duration of breastfeeding, and exclusive breastfeeding rate by mothers. These are described below.

The WHO key breastfeeding indicators and specific methodologies for their measurements which is based on current status data can be used to assess breastfeeding practices and evaluate the progress of promotional programmes. Occasionally longitudinal studies are

needed to provide more detailed information for health promotion programs.

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