

**Towards a national system for
monitoring breastfeeding in Australia:
recommendations for population indicators,
definitions and next steps**

Prepared by

**Dr Karen Webb
Dr Geoffrey C Marks
Margaret Lund-Adams
Ingrid HE Rutishauser
Bonnie Abraham**

Australian Food and Nutrition Monitoring Unit

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The Australian Food and Nutrition Monitoring Unit comprises a consortium from The University of Queensland, The University of Sydney and Deakin University. Contact details: The University of Queensland, Nutrition Program, Level 3, Edith Cavell Building, RBH, Herston Qld 4029, Australia. Telephone: +61 - 7 - 3365 5400; Facsimile: +61 - 7 - 3257 1253.

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Technical Working Group for Monitoring Breastfeeding

Name	Organization
Dr Jane Allen	Research Nutritionist, James Fairfax Institute for Paediatric Nutrition, The Children's Hospital at Westmead
Dr Ellen McIntyre	Senior Research Fellow, Dept General Practice, Flinders University
Dr Patrica McVeagh	Community representative, APMAIF, Consultant Paediatrician, Visiting Medical Officer, The Children's Hospital at Westmead, Sydney Children's Hospital, Tresilian Family Care Centre
A/Prof Jennifer Peat	Hospital Statistician & Epidemiologist, University of Sydney Dept of Clinical Sciences, The Children's Hospital at Westmead
Ms Judy Seal Community Services	State Nutrition Officer, Tasmanian Department of Health and
Dr Gulnara Semenova	Director, Lactation Resource Centre, Australian Breastfeeding Association (formerly Nursing Mothers Association of Australia) Lecturer, Key Centre for Women's Health in Society, University of Melbourne
Ms Jenny Stekovic	Nutritionist, Commonwealth Department of Health and Aged Care

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Mr Tony Lloyd	Health section, Australian Bureau of Statistics
Prof Colin Binns	Department Public Health, Curtin University
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Respondent	Representing
Lisa Amir	Centre for Mothers and Babies
Emma Awizen	Consumers' Health Forum of Australia
Colin Binns	NHMRC Dietary Guidelines Working Group
Anne Cahill	Women's Hospitals Australasia
Patricia Carter	Dept Human Services, SA
Jim Davidson	Dept Human Services, SA
Roger Hughes	Dietitians Association of Australia Public Health Association of Australia
Dorothy Mackerras	Menzies School of Health Research CRC Aboriginal and Tropical Health
Daniel McAullay	Kulunga Research Network
Karen McConalogue	Royal Australian College of General Practitioners
Maureen Minchin	Independent consultant
Stanley Nangala	Indigenous Health Policy Unit, Qld Health
Wendy Oddy	Independent consultant
Marjorie Pawsey	Australian Council on HealthCare Standards
Christina Pollard	Department of Health WA
Ann Robertson	RANZCOG
Judy Seal	Health Advancement Department of Health and Human Services, Tasmania
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Abbreviations

ABS	Australian Bureau of Statistics
ADG	Australian dietary guidelines
AFNMU	Australian Food and Nutrition Monitoring Unit
AGPS	Australian Government Publishing Service
APMAIF	Advisory Panel on the Marketing in Australia of Infant Formula
ATSI	Aboriginal and Torres Strait Islander
BF	Breastfeeding
CATI	Computer Assisted Telephone Interviews
CBF	Complementary breastfeeding
CDHAC	Commonwealth Department of Health and Aged Care
DHS	Demographic and health Surveys
EBF	Exclusive breastfeeding
EBM	Expressed breast milk
FAO	Food and Agriculture Organization
IBFAN	International Baby Food Action Network
IGAB	Interagency Group for Action on Breastfeeding
IOCU	International Organization of Consumers Unions
MAIF	Marketing in Australia of Infant Formula
NATSIS	National Aboriginal and Torres Strait Islander Survey
NBF	Non breastfeeding
NCD	Non communicable disease
NHDC	National Health Data Committee (AIHW)
NHDD	National Health Data Dictionary (AIHW)
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NMAA	Nursing Mothers Association of Australia (now Australian Breastfeeding Association)
ORS	Oral Rehydration Salts/Solution
PBF	Predominant breastfeeding
RDI	Recommended dietary intakes
SIGNAL	Strategic Inter-Governmental Nutrition Alliance
UK	United Kingdom
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Glossary

24-hour dietary recall	A classic method of dietary assessment. Information is obtained by trained interviewer (face to face or telephone) regarding all foods and beverages consumed in the previous 24 hours, usually with estimates of portion sizes and main ingredients. This information can be used to calculate food and nutrient intakes for groups
Breastfeeding	The child receives some breastmilk but can also receive any food or liquid including non-human milk
Breastfeeding duration	The total length of time an infant received any breastmilk at all from initiation through until weaning is complete
Breastfeeding intensity	Also referred to as ‘dose’ or the ‘degree of exclusiveness’ of breastmilk as the source of nourishment for the infant
Breastmilk	Human milk and colostrum
Breastmilk substitute	Any milk (other than breastmilk), or food based fluid used in infant feeding as a replacement for breast milk, whether or not it is suitable for that purpose (commonly includes infant formulae, cows milk, and other milks fed to infants)
Complementary feeding	The child has received both breastmilk and solid or semi-solid food (this may include any food or liquid including non-human milk)
Complementary foods	Any nutrient-containing foods or liquids (other than breastmilk/human milk) given to infants who are breastfeeding
Cohort studies	A longitudinal or prospective study in which subsets of a defined population can be identified to assess their exposure to a factor (eg breastfeeding) hypothesised to influence the probability of an outcome, but, in which the experimental method is not used
Cross sectional surveys	An investigation in which information is systematically collected typically to describe the distribution of an attribute (eg behaviours) as they exist in a particular population at one point in time, but, in which the experimental method is not used
Current Practices	Respondents are asked about very recent infant feeding practices usually in the previous 24 hours. Distinct from ‘recalled practices’ which occurred sometime in the past eg weeks, months or years
Exclusively breastfed	An 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

Ever breastfed	An infant has been put to the breast, if only once, and/or an infant has received expressed breastmilk but has never been put to the breast
Fully breastfed	An infant is fully breastfed if he/she receives breastmilk as the main source of nourishment. This includes infants who are either a) exclusively breastfed or b) predominantly breastfed. That is, infants can be classified as fully breastfed if a) they receive only breastmilk with no other liquids or solids (except vitamins, mineral supplements, or medicines) OR b) they receive breastmilk and water, water-based drinks, fruit juice, ORS, but do not receive breastmilk substitutes or solids. The <i>fully breastfed</i> rate is the combined rate of <i>exclusively breastfed</i> and <i>predominantly breastfed</i> .
Indicator	An indicator is used in the field of public health monitoring and surveillance to describe a specific and measurable statistical construct for monitoring progress towards a goal (a broad statement of desired improvement)
Infant	Refers to <12 month olds. ‘Children’ are 12 months or more
Initiation	The infant’s first intake of breastmilk
Point prevalence	The number of persons with a disease or an attribute at a specified point in time. Used in this report to refer to breastfeeding rates when children are at particular ages
Predominant breastfeeding	An infant’s predominant source of nourishment has been breastmilk but the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions etc); fruit juice; oral rehydration solution (ORS); drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). All other food-based fluids are excluded, in particular non-human milk
Retrospective (recalled) practices	Practices measured retrospectively, that is, respondents are asked to recall and report their behaviour as it was some time in the past
Solid foods	Any nutrient containing foods (semi-solid or solid) eg dilute infant cereals. Does not include breastmilk or breastmilk substitutes, fruit and vegetable juices, sugar water, etc
Weaning	The period during which infants are introduced to breastmilk substitutes and/or solid foods with the intention of replacing some or all of the breastmilk in the diet.
Weaned	The infant/child no longer receives any breastmilk

Summary

Introduction

Internationally and in Australia, breastfeeding has received increased attention in recent years as a focus for improving public health. Based on the weight of evidence regarding its role in health protection, governments, including the Commonwealth government of Australia and many of the states and territories, have developed policy recommendations and strategies to promote breastfeeding.

At the national level, the recently developed national nutrition strategy, *Eat Well Australia*, identifies breastfeeding as a priority area for action. The *Dietary Guidelines for Australians* nominates breastfeeding as a key dietary guideline and breastfeeding is the main thrust of the NHMRC Infant Feeding Guidelines for Health Workers (SIGNAL 2001, NHMRC 1995, NHMRC 1996).

However, information is lacking about the extent to which breastfeeding practices in the Australian population are consistent with policy recommendations and how practices are changing. While there have been many good developments internationally to standardise the definitions of optimal breastfeeding practices and to develop indicators for measuring and tracking progress, until now the approach to monitoring breastfeeding in Australia has been somewhat ad hoc.

This report is a first step towards standardising the monitoring of breastfeeding practices in Australia, with a view to documenting over time, changes in the key aspects of breastfeeding practices central to our national policies and objectives relevant to infant feeding. The report is based on a discussion paper circulated to key stakeholders in 2001, which outlined proposed indicators and definitions, and options for measurement. The discussion paper was subsequently revised to reflect the views and suggestions of stakeholders. The final report includes:

- a summary of key practices recommended in Australian breastfeeding/infant feeding policies (chapter 2);
- a review of international recommendations concerning the definitions of aspects of breastfeeding practice (chapter 3);
- a review of international indicators for monitoring breastfeeding rates and their suitability for Australia (chapter 4);
- a summary of issues in measuring key breastfeeding practices, a review of current data sources in Australia, recommendations for measurement methods and next steps (chapter 5); and
- proposed key breastfeeding indicators for Australia and those to meet international reporting obligations (chapter 6 and appendix 7).
- Key recommendations and their rationale are given in more detail in chapters 5 and 6.

Recommended definitions of breastfeeding practices

The term 'breastfeeding' is often used in a general sense and can cover many different infant feeding practices. Substantial variation in rates of breastfeeding within and between countries has been attributed in part to the lack of standardised definitions of terms for measuring breastfeeding practices.

In proposing a set of standardised definitions for Australia, consideration was given to the current Australian policies and to international developments in standardisation (WHO 1991b). Brief definitions of breastfeeding terms are given in table 1. Full definitions are given in the glossary and chapter 6.

Table 1: Summary of the WHO definitions of breastfeeding

Category of infant feeding	Requires that the infant receive	Allows the infant to receive	Does not allow the infant to receive
Exclusive breastfeeding (EBF) ^a	Breast milk (BM), including colostrum, expressed breast milk (EBM) or breastmilk from wet nurse	Drops, syrups (vitamins, minerals, medicines)	Anything else
Predominant breastfeeding (PBF) ^a	BM, including EBM or from wet nurse, as the predominant 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)
Full breastfeeding (FBF) Sum of Exclusive and Predominant BF)	BM, including EBM or BM from wet nurse	Substances specified for EBF or those specified for PBF	Anything else (in particular, non-human milk, food-based fluids)
Complementary breastfeeding (CBF)	BM and solid or semisolid foods or non-human milk	Any food or liquid including non-human milk, as well as BM	
Non-breastfeeding (NBF)	No BM	Any food or liquid including non-human milk	BM, including EBM or from wet nurse
Breastfeeding (BF)	BM	Any food or liquid including non-human milk, as well as BM	

^a The sum of EBF plus PBF is called full breastfeeding (FBF)

Source: Cattaneo A, Davanzo R & Ronfani L 2000:89 (adapted from WHO 1991b)

Recommended indicators for monitoring breastfeeding in Australia

Australia does not currently have a core set of breastfeeding indicators. In proposing breastfeeding indicators for Australia, consideration was given to the following criteria:

- relevant to key Australian policy recommendations;
- likely to lead to action to improve breastfeeding promotion;
- consistent, where possible, with previous indicators/data collected in Australia so that trends may be documented;
- feasible to collect the required information on a nationally representative sample via an ongoing health survey program;
- measurable and valid for detecting the direction and magnitude of changes over time, and differences between population sub-groups; and
- consistent with WHO wherever possible to meet international reporting obligations.

Based on these criteria, many of the WHO indicators, with some modifications, were applicable to Australia. A summary of the proposed indicators for Australia is shown in box 1.

Box 1: Proposed breastfeeding indicators for use in Australia

Indicators based on mothers' recalled practice among children aged less than 4 years

1. Percent ever breastfed
2. Percent breastfed at each completed month of age to 12 months
3. Median duration of breastfeeding among 'ever breastfed' children

Indicators based on mothers' reported current practice (previous 24 hours) among infants aged less than 6 months

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months
7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

The ages specified in the proposed indicators relate to the policy goals as specified in the current and draft revisions of the NHMRC *Dietary guidelines for children and adolescents*, and the NHMRC *Infant feeding guidelines for health workers*.

Indicators to meet international reporting obligations, eg to the WHO Global Data Bank on Breastfeeding, are outlined in appendix 7, and can be calculated from the data requirements outlined for the proposed Australian breastfeeding indicators in chapter 6. All proposed indicators are recommended for reporting in the general population. In addition, indicators should be reported on vulnerable population sub-groups (who are at risk of low breastfeeding rates, and/or on whom specific information is required for planning interventions), where sufficiently representative samples of these groups are available (from general population surveys or special purpose surveys). These groups include: mothers less than age 25, single mothers, mothers with no post-school qualifications, mothers residing in lower socio-economic areas (that is of SEIFA quintile 1) and mothers born in countries/regions other than Australia, Oceania, Europe or America, and Indigenous mothers (Jain 1996).

Recommended methods for measuring breastfeeding indicators

In chapter 5, key issues in measuring the indicators are considered and discussed in detail including: the type of survey design and survey ‘vehicles’ available to collect the information; sample requirements and the limitations of various survey ‘vehicles’ to supply an adequate sample; the validity of mothers’ recall of infant feeding practices and implications for measurement methods; the adequacy of questions used in recent surveys to supply the information required by the proposed indicators; and alternative methods of calculating the indicators to deal with small sample sizes. Based on these considerations, the report makes a number of key recommendations regarding survey vehicles and methods which are summarised below.

1. Survey ‘vehicle’ and main data sources

The data requirements for breastfeeding indicators can be met most practically through current cross-sectional large-scale population based surveys that are repeated over time. These include the ABS National Health Survey (NHS) and state and territory CATI surveys. Consideration should also be given to the design of a purpose-specific survey program (that will be repeated) for the collection of data about health, nutrition and growth of infants and children, such as the surveys in the planning stages in the UK and New Zealand.

2. Age of children to be included in the sample

To preserve comparability with the sample definitions in the 1995 and 2001 NHS, it is recommended that all children aged less than 4 years be included in the breastfeeding component of the NHS and other surveys. This maximises the sample size of children available for assessment of indicators based on recalled practice (indicators 1-3) while limiting the period over which mothers must recall their feeding practices. Indicators based on current practices relating to breastfeeding intensity (indicators 4-7) should be assessed on infants who are aged 0-6 months at the time of the survey.

The sample should include all children within these age ranges (ie not restricted to first/last born) to avoid biases due to confounding with birth order and parity. It is recommended that date of birth of survey children be collected and used to calculate age.

3. Current breastfeeding practice versus retrospective (recalled) practice

Published evidence suggests that breastfeeding indicators requiring information about the timing of introduction of liquids (other than breastmilk) and solids is more accurate when measured by mother's report of current feeding practices (usually in the 24 hours previous to the survey), than when asked to recall over months or years. Thus, the following indicators should be calculated based on current practice: percent of exclusive breastfeeding, percent of full breastfeeding, percent receiving solid foods, and percent receiving breastmilk substitutes.

It should be noted that the sample size of infants less than age 6 months in population health surveys on whom these indicators (numbers 4 to 7) can be calculated is likely to be small (150-300 infants) and will limit the power to detect modest but biologically significant changes in these rates over time.

By contrast, published evidence suggests that indicators requiring information about 'ever breastfeeding' and duration of breastfeeding (not requiring information about intensity) are reported by mothers relatively accurately over several years. Thus, the following indicators are proposed for measurement based on **recalled practices**: Percent 'ever breastfed'; Median duration of breastfeeding among 'ever breastfed' children; and Percent breastfeeding at each completed month of age to 12 months.

A validation study comparing recalled practices with data collected prospectively at relevant points in time during early infancy is recommended; the results of which will be useful in guiding future practice in the collection of breastfeeding data.

4. Survey questions to measure indicators

Current practices relating to breastfeeding intensity can be assessed using a standard question used by WHO (box 5.1, chapter 5) but additional questions will be needed to assess recalled practices of breastfeeding initiation and duration. Questions used in the 1995 and 2001 NHS surveys provide a good basis for these, but they need to be refined and tested. A large cohort study of infants from birth, such as that recently funded by the NHMRC would provide an excellent opportunity to evaluate breastfeeding survey questions, to assess their validity and the proposed methods of calculating indicators.

5. Procedures for data analysis

Since sample sizes are likely to be small from typical population health surveys (ie the subset in the appropriate age range), recommended options for maximising the sample for calculating indicators include a) grouping the data for several months of age, eg exclusive breastfeeding among children 0-4 months of age, or b) using a survival analysis approach, such as the Kaplan Meier method.

Recommended next steps in developing a system to monitor breastfeeding

Consultation with key stakeholders (users and suppliers of data about national breastfeeding rates) was undertaken in 2001 to seek consensus on the proposed 'core' set of breastfeeding indicators for Australia.

Those consulted expressed enthusiastic support for the development of standardised approaches to monitoring breastfeeding, adoption of WHO standard definitions of breastfeeding practices, and general support for the indicators proposed. On the basis of specific suggestions, breastfeeding indicators, data elements and measurement methods were amended to reduce the number of indicators, broaden the range of potential survey vehicles, and revise the approach for calculating some of the indicators.

Activities to pilot test, refine, standardise and promote the use of the indicators and definitions should now be undertaken. Key actions include:

- create a mechanism for key agencies and individuals to work together on further development and implementation of the breastfeeding monitoring system;
- develop and pilot test (including cognitive testing) breastfeeding survey questions to meet the data requirements for the proposed indicators;
- evaluate and refine the survey questions and indicators, including methods of analysis and reporting;
- disseminate and promote the use of final indicators and questions widely, including registration of definitions and concepts in the AIHW National Health Data Dictionary and Knowledgebase;
- develop a thesaurus of culturally acceptable breastfeeding terms (which are consistent with WHO definitions) to facilitate communication of the results of breastfeeding monitoring to population subgroups and health professionals who work with them;
- implement routine monitoring and reporting on population breastfeeding indicators, including regular review of indicators in light of future changes to infant feeding policies in Australia and internationally; and
- develop indicators for breastfeeding promotion for hospitals and health facility monitoring.

1 Introduction

1.1 Purpose and objectives of the report

The Australian Food and Nutrition Monitoring Unit was contracted by the Commonwealth Department of Health and Aged Care to undertake preparatory work to develop a national system for monitoring breastfeeding. The purpose of this report is to recommend a basic set of indicators and definitions for monitoring trends in breastfeeding rates in Australia and a process for further development of a system. Consultation with key users and suppliers of data has been undertaken in regards to proposed indicators outlined in a discussion paper. Comments from stakeholders provided the basis of the amended recommendations contained in this report. It is intended that this document be used as the basis to pilot test and refine indicators and survey questions. Following this process, a revised set of indicators and survey questions can then be used as the sentinel document in the process of registering data elements for breastfeeding with the AIHW National Health Data Dictionary (AIHW NHDD 2000).

A Technical Working Group guided the preparation of the discussion paper. Working group members were selected on the basis of their expertise in: epidemiology and measurement methods, particularly as applied to infant feeding; nutrition monitoring at state or national level and/or familiarity with breastfeeding policy; and promotion in populations at state and national levels.

Consultation with key stakeholders was then undertaken. Comments and critical review were sought from a broad range of stakeholders including: independent public health researchers with expertise in breastfeeding measurement; agencies who collect population data about breastfeeding, particularly the ABS, state and territory health departments; Indigenous Australian organisations; specialised hospital and health facilities providing maternal and infant services; non-government organisations promoting breastfeeding; and international health agencies undertaking breastfeeding monitoring.

The intended users of this technical report are people and organisations with an interest in measuring and tracking breastfeeding rates in Australia, ie the ABS, Commonwealth and state and territory Health Departments, the National Health and Medical Research Council, non-government organisations with a focus on breastfeeding, nutrition and maternal and child health, consumer groups, public health researchers, practitioners and health information organisations.

The objectives of the report are to:

1. identify key breastfeeding practices described in current Australian infant feeding policies which should form the basis of breastfeeding indicators;
2. present an assessment of current international recommendations for defining breastfeeding practices and indicators for their applicability to Australia;
3. identify important measurement issues to consider in making recommendations about monitoring key indicators of breastfeeding practices of interest in Australia;
4. provide an overview of the adequacy of current information available to monitor breastfeeding practices of interest in Australia based on 1-3 above;

5. recommend a set of key indicators and measurement methods (definitions, data elements and requirements, the survey 'vehicle' and sample frame) as the basis for a system to monitor breastfeeding trends in Australia. These recommendations have been modified on the basis of consultation with key stakeholders in Australia about what needs to be monitored concerning breastfeeding in Australia, and how; and
6. recommend next steps to pilot, refine and apply the indicators to monitor breastfeeding practices in Australia.

1.2 Public health significance of breastfeeding

Health outcomes

Breastfeeding is the physiological norm for feeding infants. Scientific evidence, and the strength of that evidence, is accumulating to support the view that breastfeeding is far superior to breastmilk substitutes in many respects. In relation to health outcomes, breastfeeding is associated with improved general health, growth and development of infants and protection against a number of acute and possibly chronic diseases. There has long been consensus that breastfeeding protects infants from infectious diseases in developing countries. However, there is now substantial evidence that this protection is also significant in developed countries. The American Academy of Pediatrics (1997), the Australian National Health and Medical Research Council (NHMRC) (1995) and the National Academy of Sciences (1991) cite numerous studies conducted in the United States, Canada, Europe and other developed countries. These studies provide evidence that human milk decreases the incidence and/or severity of several short-term illness: gastrointestinal infections, lower respiratory infection, otitis media, bacteraemia, bacterial meningitis, botulism, urinary tract infection and necrotising enterocolitis.

Breastfeeding has also been associated with many positive long-term health outcomes but consensus in all areas has not yet been reached. A possible protective effect of breastfeeding has been suggested for a range of chronic diseases including: allergic diseases, insulin-dependent diabetes mellitus, lymphoma, obesity, atherosclerosis, Crohn's disease, ulcerative colitis and other chronic digestive diseases. Breastfeeding has also been related to possible enhancement of cognitive development. However, improvement in research design and further investigation is required in these areas if definitive conclusions are to be reached (National Academy of Sciences 1991, American Academy of Pediatrics 1997, NHMRC 1995, Coubrough 1999, Weimer 2001).

Breastfeeding policy and promotion

In Australia the return to breastfeeding as the norm has received increased attention in recent years as a focus for improving public health. Based on the weight of evidence of positive health outcomes, Federal, State and Territory governments began to set public health goals and policies during the 1980s and 1990s that included the promotion of the 'return to breastfeeding'. A review of the evolution of breastfeeding policy in Australia is summarised in chapter 2 and attests to the range of government and non-government organisations with policies supporting breastfeeding.

1.3 The need for a system to monitor breastfeeding in Australia

The collection of information about breastfeeding practices in Australia has not kept pace with breastfeeding policy development. The first systematic attempt at obtaining a nationally representative picture of breastfeeding prevalence was made in the 1989-90 ABS Australian National Health Survey. Although the data collected in this survey were lacking in many ways, it was evident that breastfeeding rates fell well short of the national goals and targets, particularly by age 6 months, when the majority of mothers had ceased breastfeeding and were giving breastmilk substitutes (Lund-Adams and Heywood 1994). Whether national breastfeeding rates have changed in the last 10 years is unclear. A repeat of the NHS was conducted by the ABS in 1995 with improved and expanded data about breastfeeding. A summary of information available from the 1995 NHS is presented in appendix 5. However, the data were not comparable with the previous survey so that trends could not be assessed. It is expected that some information about breastfeeding trends will be obtainable by comparing the 1995 NHS results with those from the 2001 NHS (which used the 1995 breastfeeding questions). Even so, the information will not be ideal. As the following chapters outline, the approach to identifying breastfeeding indicators, definitions, survey methods, and survey questions in Australia has been somewhat ad hoc and has not been aligned to international recommendations. Thus, it is timely to take a systematic approach to decisions about what information should be collected and the methods to be used.

The purpose of monitoring national rates of breastfeeding in Australia is to document the extent to which breastfeeding practices among the Australian population and important sub-groups are consistent with those recommended by national policies for optimal protection of infant health, and how these practices are changing. The information can be used to assess the impact, over time, of the national effort to increase breastfeeding and to identify needs for further policy refinement and implementation.

The purpose of establishing and maintaining a system for monitoring breastfeeding is to ensure the regular and timely collection of valid and standardised information, appropriate analysis, and dissemination of key information that will help in meeting the purpose and uses identified above. Because information about breastfeeding is collected by a number of national and state agencies, a coordinated system could make better use of routinely collected data by ensuring its relevance, comparability and timely dissemination. The importance of standardising methods for monitoring breastfeeding is to clarify what breastfeeding practices are actually being measured (in relation to policy recommendations) and to reduce the errors in the estimates of the prevalence of these practices.

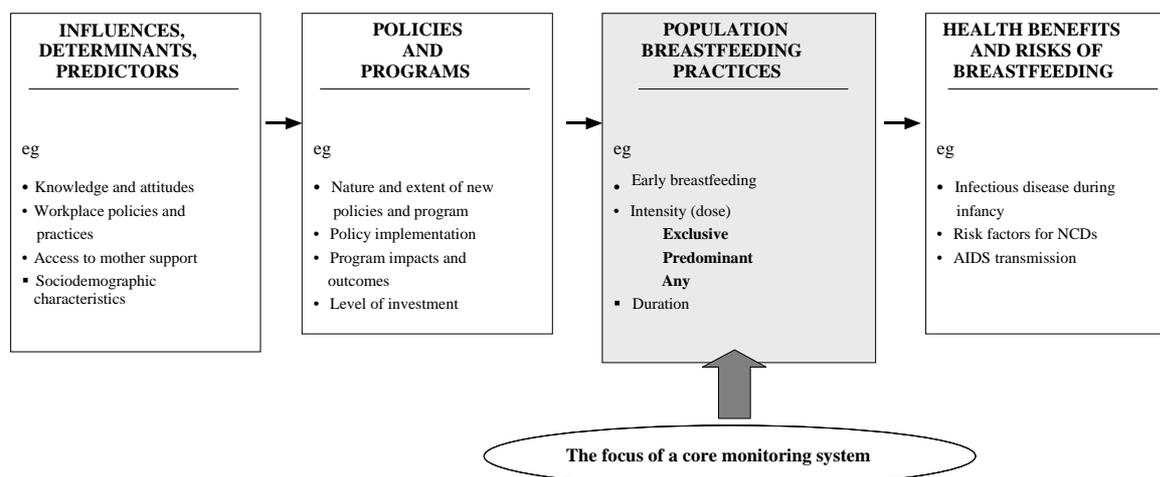
A broad range of information about breastfeeding can be measured and could potentially be monitored over time on a population basis. However, resources for health and nutrition monitoring are scarce and therefore monitoring systems should focus, in the first instance, on the minimum or core information required for decision-making and accountability.

Figure 1 illustrates the kinds of information that may be of interest to those involved in breastfeeding promotion in Australia. Only a small proportion of that information (highlighted) is appropriate for routine collection; much of it should be obtained in purpose-specific studies or program evaluations.

Core information to be recommended for a monitoring system should meet the following characteristics:

- have a sound scientific basis in terms of its relationship to health;
- have policy relevance ie likely to be useful in assessing, in a broad sense, the effects of policies;
- meet the needs of all main stakeholders or data users;
- are measurable with available tools that are sufficiently valid and sufficiently precise for the purposes; and
- can be imbedded into existing surveys or studies to guarantee that measurements will be made again, preferably on a predictable and timely basis.

Figure 1: Conceptual framework – aspects of breastfeeding of potential interest and the focus for a core monitoring system



1.4 Structure of the report

To meet the purpose and objectives of the report, the following sections are included:

1. a summary of key practices recommended in Australian breastfeeding/infant feeding policies (chapter 2);
2. a review of international recommendations concerning the definitions of aspects of breastfeeding practice (chapter 3);
3. a review of international indicators for monitoring breastfeeding rates and their suitability for Australia (chapter 4);
4. a summary of measurement issues in measuring key breastfeeding practices, a review of current data sources in Australia, and recommendations for measurement methods (chapter 5); and
5. proposed key breastfeeding indicators for Australia, including the purpose, definitions, data elements and requirements, and data sources (chapter 6).

2 Australian breastfeeding policies – what do we need to be monitoring?

The literature documents diverse benefits from human milk and breastfeeding: health, nutritional, immunological, developmental, psychological, social, economic and environmental benefits. These benefits that impact on the lives of many (the infant, the mother, the family, and even society in general) are well recognised and breastfeeding is promoted as the cornerstone of optimal infant feeding policy worldwide.

This chapter looks briefly at the evolution over time of Australian breastfeeding policies, currently recommended breastfeeding practices and the implications this has for the development of an Australian breastfeeding monitoring system.

2.1 Australian breastfeeding policies

Since the 1970s, when breastfeeding rates in Australia hit an all-time low (Lund-Adams and Heywood 1995, Scott and Binns 1998), much effort has focused on improving the situation. Many non-government and professional organisations, state governments and the Commonwealth government have been involved in this effort and have now developed their own breastfeeding policies. The evolution of these Australian policies has been strongly influenced and shaped by international breastfeeding policies and initiatives.

Initially women themselves, not government, were the most active in improving breastfeeding rates in Australia. In 1964 the Nursing Mothers Association of Australia (NMAA) was founded and it has continued to play a very important role in the promotion of breastfeeding in Australia (Lund-Adams and Heywood 1995). To reflect changing community attitudes, the association changed its name in 2001 to Australian Breastfeeding Association.

During the 1970s there was much concern internationally over the decreasing rates of breastfeeding and the increasing rates of artificial feeding and the associated health problems. This culminated in 1979 with a joint WHO/UNICEF meeting on 'Infant and young child feeding'. The meeting recommended the support of breastfeeding and the development of an international marketing code for infant formula and weaning foods. An 'International Code of Marketing of Breast-Milk Substitutes' (WHO Code) was later drafted and adopted in May 1981.

Throughout the 1980s breastfeeding was promoted internationally as the optimal method of infant feeding. In 1989, WHO and UNICEF released a statement on 'Protecting, Promoting and Supporting Breastfeeding: The Special Role of Maternity Services'. In this document, ten steps to successful breastfeeding are outlined.

In 1990, the Convention on the Rights of the Child again called international attention to the importance of breastfeeding. In 1991, WHO and UNICEF launched the Baby Friendly Hospital Initiative to promote the adoption of the ten steps to successful breastfeeding in maternity facilities around the world (Lund-Adams and Heywood 1995).

In May 2001 WHO updated its infant feeding recommendations (WHO 17 May 2001a) and is currently developing a global strategy for infant and young child feeding (WHO 9 April 2001b). These initiatives are based on and recommend continued use of past strategies such as the Baby-Friendly Hospital Initiative (WHO 1991a), the International Code of Marketing of Breastmilk Substitutes (WHO 1981) and the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding (WHO 1990, 1998b). In addition to these, WHO emphasises the need for comprehensive national policies on infant and young child feeding. Appendix 1 presents a summary of the aims and breastfeeding practices recommended in WHO breastfeeding policies over time and appendix 2 summarises key evidence from the main scientific reviews that underpin these policy recommendations.

Australian policies have been greatly influenced by international policies and the evolution of these policies over time has tended to lag slightly behind those of WHO. In 1980 the National Health and Medical Research Council (NHMRC) of Australia amended their previously released 1976 statement on 'Feeding of infants and young children' to endorse breastfeeding as the most suitable method of feeding Australian infants (Lund-Adams and Heywood 1995). 'Increase breastfeeding' was adopted as one of Australia's dietary goals in 1979 (Lester 1994). To facilitate public education this goal was later translated into the dietary guideline message of 'promote breastfeeding'. Australia was among the 118 member states to vote in favour of the WHO Code at the World Health Assembly in May 1981. Since then, Australian government bodies and manufacturers, have taken many steps towards improving the implementation and monitoring of the WHO Code. One such step has been the signing of the *Marketing in Australia of Infant Formula* (MAIF Agreement) to promote and protect breastfeeding through appropriate marketing practices (APMAIF 1999). In 1991, the Commonwealth government provided and continues to provide in principle support for UNICEF's Baby-Friendly Hospital Initiative (WHO 1991a) now administered in Australia by the Australian College of Midwives with a national advisory council drawn from other professional and consumer organisations. The college has recently applied to the government for financial support to reinvigorate and promote the Initiative more widely in Australian hospitals.

A revision by the NHMRC's of Australia's 1981 dietary guidelines was published in 1992 and resulted in a slightly modified breastfeeding guideline - 'encourage and support breastfeeding'. That same year, the Commonwealth government also ratified the '*World Declaration and Plan of Action for Nutrition*' that emanated in 1992 from the International conference on Nutrition (convened by the FAO and WHO), including its inclusion of promoting breastfeeding. Since then, the importance of breastfeeding has been reiterated in two more national policy documents: *Dietary Guidelines for Children and Adolescents* (NHMRC 1995) and *Infant feeding guidelines for health workers* (NHMRC 1996) that is based on the WHO Code. Since their publication considerable new evidence has accumulated. Currently both of these national policy documents are being revised and updated. It is anticipated that Australia will follow the recent lead of WHO, based on the evidence in its systematic review, and change the Australian breastfeeding recommendations accordingly. This change is described in the sections below.

2.2 Recommended breastfeeding practices

The optimal breastfeeding practices as outlined in current national Australian policies are:

- initiation of breastfeeding within the first hour of birth;
- frequent, on-demand feeding of newborn;
- exclusive breastfeeding for the first four to six months of life;
- breastfeeding complemented with appropriate, hygienically prepared food from four to six months; and
- continued breastfeeding to at least 12 months of age while receiving appropriate complementary foods.

It is anticipated that these recommended practices will move closer to the latest ones of WHO in their next revision, which is currently in progress. Such a change would mean a revised recommendation of 'exclusive breastfeeding for the first six months of life'. This understanding of optimal breastfeeding practices should be the basis for the development of conceptual definitions and indicators used in a national monitoring system to assess breastfeeding practices in Australia and trends over time. Collecting data on these practices is a powerful means of driving change, formulating policy, assessing the impact of breastfeeding promotion activities and highlighting trends amenable to intervention (WHO unpublished 2001). To date, the lack of adequate routine mechanisms for monitoring rates of breastfeeding has been a major deficiency in national government support of breastfeeding.

Breastfeeding practices fall into three categories: initiation (incidence) practices; intensity (degree of exclusiveness) practices; and total duration practices. Using these categories, a summary of WHO and Australian nationally recommended breastfeeding practices is given in table 2.1.

Appendix 3 summarises breastfeeding strategy/policy objectives of State and Territory governments in Australia. All of these are consistent with national policy and promote breastfeeding as the preferred method of infant feeding. However, there is great variation amongst the states regarding the level of detail specified about breastfeeding definitions and initiation, intensity and total duration practices.

Table 2.1: Summary of current recommended breastfeeding practices

	Initiation	Intensity	Total duration
World Health Organization ¹	<p>Breastfeeding should begin as soon as possible after birth (preferably within the first-half hour).</p> <p>Newborns should be breastfed frequently on-demand (which is facilitated by room-in).</p> <p>No supplements should be given to the infant.</p> <p>The use of teats and dummies should be avoided.</p>	<p>Exclusive breastfeeding for six months.</p> <p>Complementary foods, which are safe and appropriate, are needed in conjunction with continued breastfeeding from six months of age.</p>	<p>Children should continue to be breastfed for up to two years of age or beyond while receiving safe and appropriate complementary foods.</p>
Australia - national policies ²	<p>Breastfeeding should start within the first hour or so of birth.</p> <p>Mother and infant should remain together - practice rooming-in.</p> <p>Infant-led feeding, allowing the infant to regulate intake according to needs without restriction on the number or length of feeds.</p> <p>No supplements should be given to the newborn.</p> <p>Do not give artificial teats or dummies.</p>	<p>Exclusive breastfeeding for the first four to six months*.</p> <p>Solid foods should gradually be introduced from approximately four to six months of age* but breastmilk remains the preferred milk for infants up to the age of 12 months.</p>	<p>Breastmilk remains an important food for the first 12 months and continues to offer some protection into the second year of life.</p>

* A draft of the update of *Dietary guidelines for children and adolescents* and *Infant feeding guidelines for health workers* proposes to change this recommendation from 'four to six months of age' to six months.

¹ This table draws on information from a number of policy documents. For a summary and the individual reference of each WHO policy document please refer to appendix 1.

² *Dietary guidelines for children and adolescents* (NHMRC 1995) and *Infant feeding guidelines for health workers* (NHMRC 1996).

In the following sub-sections, issues relating to each of the three categories of breastfeeding practice will be explored to inform the development of conceptual definitions and contribute to the development of indicators for a national monitoring system.

2.2.1 Recommended breastfeeding practices – Initiation

Initiation refers to the infant’s first intake of breastmilk.

The early neonatal experience of breastfeeding is crucial for its continued success. Hence, much Australian focus has been placed on the principles of such international initiatives as the Baby Friendly Hospital Initiative with its ten steps to successful breastfeeding and the WHO Code (WHO 1998a, NHMRC 1995, NHMRC 1996). Practices recommended by current national Australian policies include: breastfeeding should begin as soon as possible after birth (preferably within the first hour); newborns should be breastfed frequently on-demand (which is facilitated by rooming-in); no supplements should be given to the infant; and the use of teats and dummies should be avoided. National policies also recommend that the mother should not be subjected to advertising or other forms of promotion of products covered within the scope of the WHO Code and should be informed about the benefits and the management of breastfeeding by health professionals (NHMRC 1996).

Two of the state government policies in Australia propose to measure breastfeeding initiation (appendix 3). Both suggest measurement at hospital discharge. For reasons outlined in chapter 4, this may not be a good measure of initiation. The measurement of the ‘ever breastfed’ is an alternative indicator of breastfeeding initiation. Although it does not measure ‘established’ breastfeeding, it identifies the proportion of mothers who initially attempt to breastfeed.

2.2.2 Recommended breastfeeding practices - Intensity

Breastfeeding intensity (or dose) refers to the degree of exclusiveness of breastmilk as the source of nourishment for the infant.

Australian national breastfeeding policies refer to an optimal intensity of breastfeeding. ‘Exclusive breastfeeding’ is recommended in early life. In the background paper on breastfeeding in the *Dietary Guidelines for Children and Adolescents* a list is given of WHO breastfeeding definitions (NHMRC 1995).

Table 2.2: WHO breastfeeding definitions - criteria for inclusion in infant feeding categories

Exclusive breastfeeding	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 infants’ predominant source of nourishment has been breastmilk, but the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions etc); fruit juice; oral rehydration solution (ORS); drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). All other food-based fluids are excluded, in particular non-human milk.
Complementary feeding	The child has received both breastmilk and solid or semi-solid food (this may include any food or liquid including non-human milk)
Breastfeeding	The child receives some breastmilk, but can also receive any food or other liquid including non-human milk.

Source: NHMRC 1995.

The definition of 'exclusive breastfeeding' used in the Australian national policies is implied to be consistent with that of WHO.

The term "Full breastfeeding" is often used synonymously with exclusive breastfeeding. However, it covers both exclusive and predominant breastfeeding. In other words it summarises those whose infants receive their predominant source of nourishment from breastmilk, but does not distinguish between exclusive or predominant breastfeeding. Clear definitions of breastfeeding intensity are essential for monitoring and research. There has been considerable confusion and variation in the terminology and the categories used to define breastfeeding intensity in the international literature.

In addition to the confusion about breastfeeding intensity definitions, there has also been confusion about what breastfeeding intensity practices to recommend. Due to significant physiological, nutrition, growth and health reasons (Brown et al 1998), there has long been consensus on the need for exclusive breastfeeding in early life. However, there has been considerable debate over its optimal duration and when complementary foods should be introduced.

In light of this debate, early in 2000 WHO commissioned a systematic review of the published scientific literature on the optimal duration of exclusive breastfeeding. More than 3000 references were identified for independent review and evaluation (WHO 9 April 2001b, WHO 2 April 2001b). However, to specifically look at exclusive breastfeeding for four to six months as compared to six months only two small controlled trials and 17 observational studies were identified. The outcome of this process has been a change in WHO's infant feeding recommendations. WHO has replaced its earlier recommendation of 'exclusive breastfeeding for four to six months' with the new recommendation of 'exclusive breastfeeding for six months'. This new recommendation, as part of the 'Infant and young child nutrition' resolution, was endorsed by the Fifty-fourth World Health Assembly on 17 May 2001 (WHO 17 May 2001a). Obviously, this change in recommendation will necessitate changes in breastfeeding indicators used for monitoring purposes.

The national Australian guidelines published in 1995 and 1996 were in line with the then current WHO guidelines to exclusively breastfeed until four to six months. With the next update of Australian policy, it is envisaged that Australia will follow WHO's lead and extend the guidelines to 'exclusively breastfeed for six months'. This will bring the Australian national policy back in line with WHO's recommendations on the duration of exclusive breastfeeding.

Three of the state government policies refer to breastfeeding intensity and recommend an optimal duration (appendix 3). One recommends 'exclusive breastfeeding for the first four to six months'. (However, no definition of 'exclusive' is given.) Two other state government policies refer to 'full' breastfeeding at six months of age. (One of these does not define the term 'full'. The other state's definition of 'full' breastfeeding is consistent with that of WHO).

2.2.3 Recommended breastfeeding practices – Total duration

Breastfeeding duration (total) refers to the total length of time an infant received any breastmilk at all, from initiation through until weaning is complete. This total duration includes the initial exclusive breastfeeding period.

The background paper on the national Australian breastfeeding guideline states that breastmilk remains important for the first 12 months of life and continues to offer some protection into the second year of life (NHMRC 1995).

None of the state government breastfeeding policies recommend an optimal total duration of breastfeeding. However, one policy does state that ‘breastfeeding be encouraged as the preferred method of infant feeding (especially in the first three months of life)’.

Controversy surrounds the optimal duration of breastfeeding and the impact of breastfeeding beyond 12 months of age is still being debated. Recommendations on continued duration of breastfeeding differ between developed and developing countries. WHO still recommends that after the initial period of exclusive breastfeeding, “children should continue to be breastfed for up to two years of age or beyond while receiving nutritionally adequate and safe complementary foods.” (WHO 1995, WHO May 2001a) The optimal duration most likely depends on the particular characteristics of the mother and child (Brown et al 1998). In Australia, the NHMRC has taken a cautious approach to duration, noting that some groups in the community react negatively to the suggestion of breastfeeding for two years (Colin Binns, personal communication).

2.2.4 Other issues influencing breastfeeding

Breastfeeding initiation, intensity and duration are determined by many factors other than national policies. As shown in figure 1, other factors of interest to breastfeeding researchers and policy makers are influences, determinants and predictors; policies and programs; and health benefits and risks. While all these factors are intrinsically interesting, they are not the focus of a core monitoring system. To ensure that key data are routinely collected, the core data requirements of the monitoring system must be kept simple and focus on measuring breastfeeding practices that are highlighted as most important

2.3 Implications for policy statements

Policy needs to drive what information is collected in a national monitoring system. When policy clearly specifies recommended breastfeeding practices and gives explicit definitions for all terminology used, the subsequent development of a monitoring system is simplified. Australia’s current national policy documents imply the use of WHO’s set of definitions and imbed recommended breastfeeding practices throughout pages of text rather than to make them explicit in clear statement of policy recommendations. Improvement in clarity is needed in the next revision/update of the national policy documents. Current state government breastfeeding policies echo the sentiment of national policy and promote breastfeeding as the preferred method of infant feeding. However, the states vary in the definitions they have used and the level of detail specified regarding initiation, intensity and total duration practices. For a national monitoring system to provide useful data for as many stakeholders as possible, greater clarity and improved consistency is needed in and between national and state policies.

3 Breastfeeding definitions – standardising how we define breastfeeding practices for monitoring the Australian population

As outlined previously, Australian and international policies have long promoted breastfeeding as the cornerstone of optimal infant feeding practice. Despite this international consensus on the need to promote breastfeeding, there has not been consensus or consistency in defining different aspects and levels of breastfeeding behaviours.

This lack of clear definitions has had a major negative impact on many areas of breastfeeding promotion. Two significant areas affected have been 1) the research that underpins breastfeeding policy and 2) the monitoring of breastfeeding rates. Lack of clear definitions has made the interpretation of data linking breastfeeding with infant health, nutrition, growth and development and maternal fertility difficult. Conflicting findings and problems with comparability between studies have hampered understanding and reaching consensus on many health-related issues (Labbok and Krasovec 1990, Auerbach et al 1991; Coffin et al 1997, McIntyre E 1998). Lack of clear and consistent definitions has rendered data collected on breastfeeding rates difficult to interpret. Without an accurate national picture of breastfeeding practices and how these are changing over time, it is difficult to make rational decisions about the need for additional/more effective programs and interventions to achieve policy goals. In fact, inaccurate monitoring data can lead to unjustified optimism and hence inaction (Cattaneo et al 2000). Precise and consistent definitions of breastfeeding are essential for breastfeeding research (to ensure appropriate conclusions are reached by policy makers about breastfeeding practice) and for breastfeeding monitoring (to ensure data is meaningful and useful for informing program implementation). Achieving national agreement to an official set of breastfeeding definitions can also have other flow-on benefits, such as consistency in terms used in: education of the public; training of health professionals; and communication between different groups implementing breastfeeding programs.

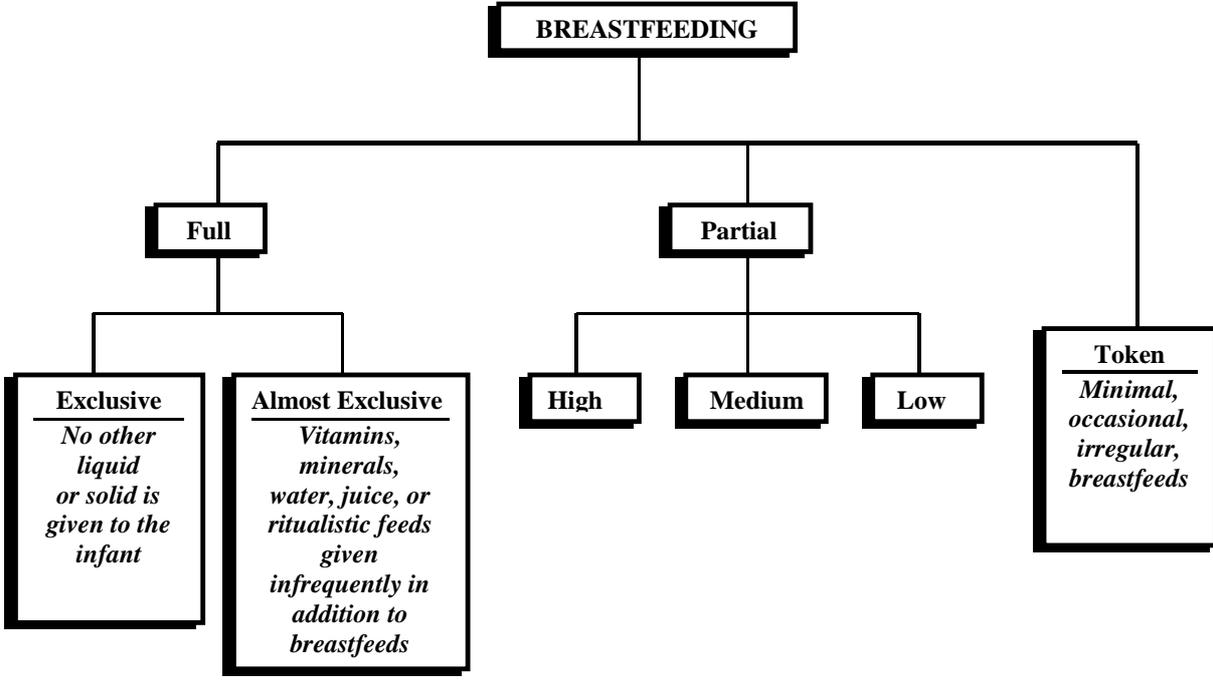
This chapter will briefly review the evolution of international breastfeeding definitions and discuss the implications for the design of an Australian breastfeeding monitoring system.

3.1 International breastfeeding definitions

Even though the problems caused by lack of consistent breastfeeding definitions had long been recognised, they became progressively more apparent as international and non-government organisations intensified their breastfeeding activities in the early 1980s (WHO 1996). By 1988, the Interagency Group for Action on Breastfeeding (IGAB) had met to develop a set of definitions that could be used as standardised terminology for the collection and description of cross-sectional information on breastfeeding behaviour. The schema developed at this meeting was reviewed and revised at subsequent IGAB meetings attended by more than 30 invited experts (Labbok and Krasovec 1990, Coffin et al 1997). Published in 1990, this schema: acknowledges that the term ‘breastfeeding’ alone is insufficient to describe the numerous types of breastfeeding behaviour; distinguishes ‘full’ from ‘partial’ breastfeeding; subdivides ‘full’ breastfeeding into categories of ‘exclusive’ and ‘almost exclusive’ breastfeeding; differentiates among levels of ‘partial’ breastfeeding (high, medium and low); and recognises that there can be ‘token’ breastfeeding with little to no nutritional impact.

A diagrammatic illustration of this schema, known as the ‘Labbok and Krasovec Schema’, can be seen in figure 3.1.

Figure 3.1: Labbok and Krasovec (1990) Schema for breastfeeding definition



It is notable that this schema was intended to provide a detailed description of infant consumption of breastmilk at a single point in time for use in clinical practice and breastfeeding research, and was not designed for monitoring national indicators of key breastfeeding behaviours over time. ‘Exclusive’ breastfeeding is defined in this schema in the strictest sense – that is, no other liquid or solid enters the infant’s mouth. The rationale for such strictness was that even the addition of water alone increases the risk of diarrhoea. This has immediate clinical practice implications and in breastfeeding research, would act as a confounder or effect modifier. The authors noted that, if appropriate, during later stages of data analysis, ‘exclusive’ and ‘almost exclusive’ categories could be combined under the term ‘full’ breastfeeding. Their rationale for proposing different levels of partial breastfeeding was that studies show a dose-response relationship between complementary foods/fluids and morbidity/mortality outcomes. The more an infant receives breastmilk complements, the higher are the chances of diarrhoea and other causes of morbidity, malnutrition and mortality. ‘Token’ breastfeeding was included in the schema as a practice where breastmilk is fed primarily for comfort and consoling, not primarily for nutrition or immunologic purposes (Labbok and Krasovec 1990).

In the year following the publication of the Labbok and Krasovec Schema, WHO convened a meeting to reach a consensus on the definitions of key breastfeeding indicators and specific methodologies for their measurement for international use (WHO 1991b). The definitions agreed upon and the criteria for specific breastfeeding categories are summarised in the following table (table 3.1).

Table 3.1: Summary of the WHO definitions of breastfeeding

Category of infant feeding	Requires that the infant receive	Allows the infant to receive	Does not allow the infant to receive
Exclusive breastfeeding (EBF) ^a	Breast milk (BM), including colostrum, expressed breast milk (EBM) or breastmilk from wet nurse	Drops, syrups (vitamins, minerals, medicines)	Anything else
Predominant breastfeeding (PBF) ^a	BM, including EBM or from wet nurse, as the predominant 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)
Full breastfeeding (FBF) (Sum of Exclusive and Predominant BF)	BM, including EBM or BM from wet nurse	Substances specified for EBF or those specified for PBF	Anything else (in particular, non-human milk, food-based fluids)
Complementary breastfeeding (CBF)	BM and solid or semisolid foods or non-human milk	Any food or liquid including non-human milk, as well as BM	
Non-breastfeeding (NBF)	No BM	Any food or liquid including non-human milk	BM, including EBM or from wet nurse
Breastfeeding (BF)	BM	Any food or liquid including non-human milk, as well as BM	

^a The sum of EBF plus PBF is called full breastfeeding (FBF)

Source: Cattaneo A, Davanzo R & Ronfani L 2000:89 (adapted from WHO 1991b)

WHO intended that breastfeeding data would be collected using a household survey methodology, on all live children less than 24 months of age (not yet having their second birthday) and on current feeding practice (for the 24 hours preceding the survey) (WHO 1991b).

The essence of the WHO breastfeeding categories is similar to that of the Labbok and Krasovec Schema. However, there are some important differences and these are:

1. Use of the term 'breastmilk', including milk expressed or from a wet nurse, not just the use of the term breastfeeding.
2. A change in terminology from 'almost exclusive' to 'predominant'.
3. The acceptance of drops or syrups (vitamins, minerals, medicines) in the category 'exclusive' breastfeeding.
4. Use of the term 'complementary feeding' rather than the term 'partial' breastfeeding.
5. No further sub-classification of the 'complementary feeding' category.
6. No clear distinction of a 'token' breastfeeding category.

The Labbok and Krasovec Schema has been criticised for not being immediately applicable to pre-term infants who are fed expressed breastmilk and not breastfed at their mother's breast (Coubrough 1999). The WHO set of definitions is an improvement on the Labbok and Krasovec Schema. The WHO set of definitions expands the breastfeeding definition further to specifically state that it includes 'breastmilk', whether expressed or from a wet nurse.

WHO's choice of the category name 'predominant', over the original 'almost exclusive' seems logical and likely to reduce confusion. As it is defined, breastmilk certainly is the predominant source of nourishment.

The inclusion of drops or syrups (vitamins, minerals or medicines) in the 'exclusive' category by WHO can be defended on the basis that these should be hygienic preparations (unlikely to introduce contamination) that are given when medically necessary. They are not being added as a nutrition substitute for breastmilk.

Many have been confused and found it difficult to understand the range of terms used to describe breastfeeding intensity. The terms 'full' and 'partial' breastfeeding are often used to broadly classify breastfeeding. The WHO set of definitions and the Labbok and Krasovec Schema agree completely on the meaning of the term 'full' breastfeeding. It refers to those infants who receive their primary source of nourishment from breastmilk, not from a breastmilk substitute (a food-based fluid). These infants can receive vitamins, minerals, medicines, water, juice or ritualistic fluids in limited quantities in addition to breastmilk. In WHO terminology, 'full' breastfeeding is equal to the sum of 'exclusive' breastfeeding plus 'predominant' breastfeeding. Using the Labbok and Krasovec Schema terminology, 'full' breastfeeding is equal to 'exclusive' breastfeeding plus 'almost exclusive' breastfeeding. Unlike Labbok and Krasovec, WHO does not use the term 'partial' breastfeeding. If an infant is breastfeeding, but not exclusively or predominantly, then the simple term 'breastfeeding' is used. If an infant is receiving solid or semi-solid foods or non-human milk in addition to breastmilk, WHO classifies this as 'complementary' feeding.

The Labbok and Krasovec Schema also describes a way to sub-classify 'partial' breastfeeding into 'high', 'medium' and 'low'. As the authors point out, this is particularly useful when looking at the dose-response relationship of differing levels of partial breastfeeding with morbidity, malnutrition and mortality (Labbok and Krasovec 1990). Being able to distinguish between outcomes at these different intensities of partial breastfeeding may be useful in specialised studies. This level of detail would not be of key policy relevance nor feasible to collect for monitoring purposes at a national level.

For the purposes of monitoring breastfeeding rates at the national level, the use of the third broad category of 'token' breastfeeding in the Labbok and Krasovec Schema appears unnecessary. It does not specifically relate to any of the recommended practices outlined in the national policies identified in chapter 1. Of course, 'token' breastfeeding for comfort may have clinical significance. It may also be important to measure when conducting studies investigating the dose-response relationship of differing intensities of breastfeeding with morbidity, malnutrition and mortality. Infants who are being 'token' breastfed would be receiving less breastmilk than those who are receiving 'low partial' breastfeeding (Labbok and Krasovec 1990). WHO did not include a 'token' category in their set of definitions.

Despite the availability and the push to use standard international definitions, only limited progress has been made in developed countries. The United States (American Academy of Pediatrics 1997), the United Kingdom (Foster et al 1997), Canada (Canadian Perinatal Surveillance System 1999) and New Zealand (Coubrough 1999) are still using a range of definitions. This greatly limits international comparability. None of these four countries seem to have adopted, in its entirety, the Labbok and Krasovec Schema. The breastfeeding indicators recommended for use in breastfeeding program evaluation by the US Evaluation Project (1995) are based on the WHO set of definitions. None of these countries have developed a set of definitions that surpass or are more appropriate for national monitoring purposes than those of WHO (American Academy of Pediatrics 1997).

Many developing countries have followed WHO's lead and adopted the use of its standard definitions. Breastfeeding data, collected using these definitions, are fed into the WHO Global Data Bank on Breastfeeding (WHO 1996). This data bank collects breastfeeding information from around the world based on two types of indicators: those derived from households; and those used to assess health facility practices that affect breastfeeding (which are also part of the Baby Friendly Hospital Initiative). Consistent use of WHO's breastfeeding definitions are essential if the world is to gain maximum benefit from a single global breastfeeding data bank (WHO 1996). In 1996, nationally representative breastfeeding data from 61 of WHO's 190 member states (which accounted for 58% of the world's total infant population at the time) were included in the Global Data Bank. At this time, South-East Asia had the broadest coverage, with representative breastfeeding data gathered for 93% of infants. In contrast, breastfeeding data was only available for 7% of the total infant population in the Western Pacific region (to which Australia belongs).

3.2 Breastfeeding definitions used in Australian studies of infant feeding practices

Infant feeding surveys and other studies, conducted throughout Australia to document initiation, prevalence and duration of breastfeeding have used a range of breastfeeding definitions. This hampers their comparability and ultimately their usefulness (NHMRC 1995, Lund-Adams and Heywood 1995, Cattaneo et al 2000). Some studies have attempted to outline breastfeeding definitions, but many have given no breastfeeding definitions at all. Wide variation in the meaning of breastfeeding terms in current use has been described among a sample of Australian health professionals (Mackerras 1998).

Australia's first attempt at gathering a picture of the national breastfeeding situation was in response to the need for data by the Australian delegation to the 1983 World Health Assembly. This attempt by the Commonwealth Department of Health was plagued with difficulties (Palmer 1985, Lund-Adams and Heywood 1995). Sixty hospitals in Australia were selected to represent major maternity hospitals, private nursing homes, regional hospitals, district base hospitals and smaller country hospitals. A member of the maternity staff at these facilities was asked to estimate (rather than survey) the percentage of mothers who were 'fully' (without complementary feedings) breastfeeding their infants at hospital discharge. In addition to these estimates on initiation, Palmer (1985) gathered information from existing administrative statistics of state and territory health departments, and from available survey data to estimate prevalence of breastfeeding at later infant ages. Lack of consistent breastfeeding definitions across the numerous studies (all conducted for different purposes with different methodologies, different infant age groups and different reporting periods) clearly reduced the reliability and meaningfulness of the estimates derived. No attempt was made to define different aspects of breastfeeding or distinguish between different levels of breastfeeding intensity after discharge from hospital.

Australia's next attempt at gathering national breastfeeding data was also disappointing. In the 1989-90 NHS, as part of the Women's Health Questionnaire, women aged between 18-50 years with children aged five years or less were asked to complete a maximum of three questions on breastfeeding. The questions were poorly designed and produced data with considerable limitations. One such limitation was that no specific definitions of breastfeeding were stated. 'Are you breastfeeding or have you breastfed your child or children who are currently aged five years or less?' This question allowed the percentage of women who had ever breastfed to be calculated. It is impossible to calculate different levels of breastfeeding intensity from this data (Australian Bureau of Statistics (ABS) 1991a, b, Lund-Adams and Heywood 1994, Lund-Adams and Heywood 1995).

In the 1995 NHS breastfeeding information was collected on each child under four years of age. Initial questions asked if the child had ever been breastfed and if so, was that child currently being breastfed. For those who were currently breastfeeding information was asked about breastfeeding at hospital discharge. Subsequent questions determined if foods other than human milk had been introduced and if so, at what age regular consumption of these had started. Questions were specifically asked about infant formula, cow's milk, other milk substitutes and solid food. No questions were asked about the intake of drops, syrups, water, fruit juices or other liquids. Donath and Amir (2000) have analysed the 1995 NHS breastfeeding data. Because of limitations with the questions asked (which were not based on any set of specified definitions), an infant classified as exclusively breastfed may have been receiving fruit juice and other foods on an irregular basis; a categorisation which is clearly inconsistent with the WHO definition of 'exclusive' breastfeeding. Donath and Amir (2000) present rates of 'full' and 'partial' breastfeeding during the first year of life for Australian infants. Even these rates need to be interpreted with caution. As questions were only asked about the commencement of *regular* intake of breastmilk substitutes, not the actual commencement, Donath and Amir's classification of 'full' breastfeeding is not identical to that of WHO. Donath and Amir (2000) conclude that an adequate definition of breastfeeding is essential for good research and suggest "Revised breastfeeding questions, using improved definitions, should be piloted prior to the next NHS."

3.3 Definitions for use in a national breastfeeding monitoring system

When considering the development of a national breastfeeding monitoring system, as already pointed out, precise and consistent use of breastfeeding definitions is essential. Comparability of data depends largely on standardised definitions and methods of collecting information (Cattaneo et al 2000). For breastfeeding practices and trends to be monitored over time it is imperative that clear definitions of the different patterns of breastfeeding behaviours are articulated and built into the design of such a national monitoring system. Such definitions could then be adopted by others conducting surveys throughout Australia. This would increase comparability and usefulness of data collected from numerous sources (such as state, regional, location-specific, sub-group-specific surveys) across the country.

It would seem prudent for the Australian breastfeeding monitoring system to adopt the WHO set of breastfeeding definitions, primarily because it builds on international work to promote standardisation. In particular:

- the NHMRC policy documents, *Dietary Guidelines for Children and Adolescents* and *Infant feeding guidelines for health workers*, refer to and imply the use of the WHO set of definitions;

- the terms used in the WHO set of definitions were developed with the purpose of assessing breastfeeding practices and evaluating the progress of promotional programs. They are appropriate for national monitoring purposes;
- the WHO set of definitions is widely recognised and the most widely used for monitoring purposes internationally;
- adopting the WHO set of definitions would allow the national Australian breastfeeding rates to be compared with those of other countries using the same set of definitions; and
- the WHO definitions are conceptually appropriate. There is no clear rationale for developing or adopting a different approach.

Monitoring breastfeeding practices at the national level should at the very least differentiate between 'full' and 'complementary' breastfeeding. But ideally, in line with breastfeeding practices recommended in national policies, 'exclusive' breastfeeding also needs to be measured. If questions are developed based on the WHO set of definitions, then this will allow the data to be reported at various levels of intensity, ie 'exclusive', 'predominant', 'full', 'complementary' breastfeeding. (Note: 'Exclusive' and 'predominant' breastfeeding together constitute 'full' breastfeeding.)

4 Developing standard indicators of breastfeeding practices in the Australian population

In previous chapters, key breastfeeding practices underpinning Australian breastfeeding policies were outlined, and conceptual definitions were discussed with the aim of standardising the terms used to describe and measure key breastfeeding practices.

In this chapter, some of the considerations in selecting/developing indicators for breastfeeding are discussed with a view to identifying what should be measured and monitored. The subsequent chapter deals with the operational definitions of indicators, and considers how, precisely, the indicators should be measured.

An ‘indicator’ is used in the field of public health monitoring and surveillance to describe a “specific and measurable statistical construct for monitoring progress toward a goal [a broad statement of a desired improvement]” (d’Espaignet et al 1994). Indicators are usually derived from policy and program goals and objectives, reflecting, to some extent, the relevance and importance of the information embodied in the indicators, for use by policy/program stakeholders.

The development of breastfeeding indicators for Australia needs to be considered in the context of a broad governmental effort to improve the comparability, consistency and relevance of national information on the health and well being of Australians. The National Health Information Management Group and the National Public Health Information Group, in collaboration with AIHW have made significant advances in development of standards, models, definitions, structures, frameworks, and criteria for health information and indicators for reporting progress, such as contained in a recent report on a national health performance framework (NHPC 2001) The main purpose of developing national breastfeeding indicators is to provide a common set of measures for use by those who collect data a) on nationally representative samples and b) others who wish to compare their sample data with national data about breastfeeding.

The development of an appropriate set of indicators for national monitoring underpins decisions about what types of information should be collected and how.

The following criteria are useful in the selection/development of indicators:

- relevant to key Australian policy recommendations;
- consistent with WHO wherever possible to meet international reporting obligations;
- consistent with previous indicators/data collected in Australia so that trends may be documented;
- feasible/simple to collect the required information on a nationally representative sample; and
- measurable and valid for detecting the direction and magnitude of changes over time, and differences between population sub-groups.

This chapter addresses the first two of these criteria by summarising the key breastfeeding practices for measurement and the suitability of international indicators for Australia. Chapter 5 deals with the last three criteria, with a discussion of operational definitions, and issues in designing the methods to collect data and calculate the indicators.

4.1 Policy recommendations as the basis for indicators

In chapter 2, breastfeeding practices outlined in current Australian policies were described and include:

- exclusive breastfeeding for the first 4-6 months of life;
- followed by timely introduction of complementary feeding (4-6 months); and
- continued breastfeeding to at least 12 months.

In the current round of policy revisions for the NHMRC *Dietary guidelines for Australians*, and the *Infant feeding guidelines for health workers*, the key changes forecast are: an extension of the recommended time for exclusive breastfeeding to 6 months of age, with an accompanying recommendation that complementary feeding commence at 6 rather than 4 months. These follow recent changes adopted by the World Health Organization as described in chapter 2.

Information about these aspects of breastfeeding is required to assess the effectiveness of current national and state efforts, both government and non-government, to improve breastfeeding practices consistent with policy recommendations.

Practices relating to early breastfeeding or breastfeeding initiation within hospital or other health facilities are also a substantial part of the current Australian infant feeding policies. Such practices were recommended by WHO for a separate facilities-based collection. These include indicators about breastfeeding rates at hospital discharge, timely first suckling, breastmilk substitute and supplies rate, bottle fed rate prior to hospital discharge, rooming-in rate, and pacifier use rate (WHO 1992). These were not further considered here as a basis for population indicators, however there is a recognised need to develop separate hospital based indicators for monitoring health facilities (see recommendations).

4.2 Breastfeeding indicators in Australia and internationally

4.2.1 Australia's goals and targets for breastfeeding

At present, Australia does not have a set of breastfeeding indicators aligned to the current policies.

In 1993, health goals and targets for Australia were proposed, which included breastfeeding targets for the year 2000 (Nutbeam et al 1993). The breastfeeding targets were:

- To increase the proportion of infants who are breastfed following hospital discharge to 90%.
- Among babies up to 3 months of age...to increase the proportion who are fully* breastfed to 60 percent and the proportion who are partially breastfed to 80%.

- Among babies up to 6 months of age...to increase the proportion who are fully breastfed to 50 percent and the proportion who are partially breastfed to 80 percent.

*fully breastfed was not defined

These targets, or measurable national objectives for population health, were the first attempt to identify breastfeeding as a national health issue and to aim for quantified improvements in a specific time period. Implicit in these targets were indicators or aspects of breastfeeding to be measured, to assess the extent to which the targets had been achieved. A summary of information available from the 1995 NHS is presented in appendix 5. Although these targets were useful in helping to focus attention during the 1990s on monitoring national progress on breastfeeding, they now require updating in relation to national and international developments in infant feeding policy recommendations and global indicators for monitoring (see section 4.2.3).

4.2.2 Indicators in other industrialised countries

Although many developed countries have a policy to promote exclusive breastfeeding in early infancy, their health promotion objectives, targets and indicators generally deal with the prevalence and duration of ‘any breastfeeding’ during the first year. For example, the US Healthy People 2010 national strategy for improving health of Americans, recommends targets for breastfeeding which comprise: “an increase in the proportion of mothers who breastfeed in the early postpartum period (from 64 to 75%); at 6 months, (from 29 to 50%); and at one year (from 16 to 25%)” (US DHHS 2000). These targets are highly specific about the baseline rates and improvements sought within a decade, but do not specify exclusive or predominant breastfeeding. This is in contrast to the policy of the American Academy of Pediatrics (1997) which specifies in considerable detail the need to promote exclusive breastfeeding.

Similarly, Canada’s Perinatal Surveillance System describes and reports on two indicators: breastfeeding initiation rate as a proportion of mothers who report ever breastfeeding their children, and breastfeeding duration as the total length of time the infant was breastfed, among women who have completed breastfeeding at the time of the survey (Canadian Perinatal Surveillance System 1999).

Recently, the data elements of new breastfeeding indicators have been proposed for New Zealand which include the measurement of initiation, established breastfeeding, and continued breastfeeding, with an emphasis on distinguishing between fully and partially breastfed in the first 6 months (Coubrough 1999).

There is considerable interest in the development of standardised indicators for monitoring breastfeeding trends in European countries (Yngve and Sjostrom, 2001, Cattaneo 2000).

4.2.3 WHO recommended global indicators for assessing breastfeeding practices

Key indicators for global (international) and national monitoring of breastfeeding practices from household surveys were developed by WHO in 1991 for use in standardising the reporting of country data to the WHO Global Data Bank on Breastfeeding (WHO 1991b). The rationale for the selection of key indicators was that they were “limited in number, relatively easy to measure and interpret, and operationally useful”.

Box 4.2: Selected WHO indicators¹ of breastfeeding practices² relevant for development of Australian indicators

Exclusive breastfeeding rate:	Proportion of infants less than 4 months* of age who are exclusively breastfed.
Predominant breastfeeding rate:	Proportion of infants less than 4 months* of age who are predominantly breastfed.
Continued breastfeeding rate (1 year):	Proportion of children 12-15 months of age who are breastfeeding.
Ever breastfed rate:	Proportion of children who have ever received breastmilk.
Median duration of breastfeeding:	The age when 50% of children are no longer breastfed.

¹ Source: WHO 1991b, recommended for collection in children under 24 months, except for median duration, recommended for collection in children under 36 months.

² Optional additional indicators include: ever breastfed rate, timely first suckling rate, median duration of breastfeeding, exclusive breastfeeding by natural mother.

* The WHO has recently indicated an intention to change the recommended duration of exclusive breastfeeding to six months.

As noted above, the WHO indicators relate directly to mothers' practices at home and do not include measures primarily related to institutional practices, eg timing of first breastfeed, breastfeeding at hospital discharge. A separate set of indicators to be collected at institutional level was generated for this purpose. Nor do the WHO key household indicators include measures of family attitudes, mothers' intentions and support for breastfeeding. These were regarded as more appropriate for purpose-specific research, using appropriate qualitative and quantitative methods, because they are difficult to measure and interpret, and they are not direct measures of practice (WHO 1991b, WHO 1992).

The WHO indicators and definitions have been widely applied over the last decade in developing countries, and their use has improved the quality and comparability of breastfeeding data (WHO 1996). However, the WHO Global Data Bank has observed that industrialised countries have not used standardised definitions and indicators, so that the data from these countries are not comparable internationally (WHO unpublished). It notes that the inadequacy of data from these countries is ironic in that breastfeeding is of benefit to children in all countries, rates are lowest in industrialised countries, and these countries have the greatest resources for monitoring health related practices.

4.3 Suitability of WHO breastfeeding indicators for Australia

Based on the criteria of policy relevance, a number of the WHO recommended indicators provide a useful basis for adapting/developing indicators for Australia as described below. Some additional indicators are also considered relevant to fully describe key breastfeeding practices in Australia.

The exclusive breastfeeding rate would give an overall measure of the extent to which women have adopted breastfeeding behaviour consistent with the current Australian policies with regard to breastfeeding intensity or exclusivity for the current recommended duration. The practice of exclusive breastfeeding involves not giving water or other fluids (but allows drops and syrups of vitamins, minerals or medicines).

Exclusive breastfeeding has not been measured in any national survey in Australia; the feasibility of collecting the information would need to be assessed (see chapter 5). Because the Australian policy about duration of exclusive breastfeeding is likely to change following the change by WHO to “6 months”, exclusive breastfeeding should be measured to 6 months, rather than four, but reported for each month of age, if possible.

The predominant breastfeeding rate or full breastfeeding rate would give a measure of the extent to which the infant’s main source of nourishment is breastmilk, and therefore population practices are generally in accordance with current Australian policy. Evidence indicates that predominant breastfeeding confers significant health benefits in comparison with minimal or no breastfeeding. Several of the state and territory policies/strategies recommend “full” breastfeeding. Two states in Australia monitor full breastfeeding rates at 6 months of age. The WHO defines full breastfeeding as the sum of exclusive breastfeeding plus predominant breastfeeding.

The rate of breastfeeding (any) at each month of age up to twelve months would identify the prevalence of breastfeeding among all children in the survey up to the recommended 12 month(s) of age. This information will be useful to inform decision-making in targeted breastfeeding campaigns. It would also provide states and territories with information to report on progress towards their breastfeeding targets.

The continued breastfeeding rate to 12 months would assess the extent to which mothers who commence breastfeeding in Australia continue for at least 12 months as specified in the Australian *Dietary guidelines for children and adolescents*. The indicator may best be combined with other indicators of duration among those who commenced breastfeeding (see median duration of breastfeeding below).

The **“ever breastfed” rate** would be useful to identify the percentage of mothers who have attempted to supply breastmilk to their infants, and thus would provide a measure of success in disseminating the policy recommendations. It also provides a baseline, or starting point from which subsequent duration of breastfeeding can be calculated.

Median duration of breastfeeding, or the age when 50% of children are no longer breastfed would be a useful summary statistic of duration to monitor over time. Because the distribution of breastfeeding duration may be skewed, the median provides a more robust measure. Mean duration of breastfeeding was added to the WHO list of optional indicators in 1996 because it is easy to calculate and interpret, and is usually reported by member countries (WHO 1996). A more relevant summary measure of the success of increasing duration of breastfeeding, as distinct from increasing initiation rates, would be the median duration of breastfeeding in children who were ever breastfed (O’Gara et al 1995). The rates of continued breastfeeding to each month of age to 12 months which are required for calculating this indicator could also be reported. This would eliminate the need for a separate indicator for continued breastfeeding to 12 months. Two of the key indicators, as defined by WHO, were not considered suitable for a core set of population indicators of breastfeeding practices in Australia. These were bottle feeding rate and timely complementary feeding rate. The rationale is summarised below.

WHO include a bottle feeding rate in its list of key indicators (WHO 1991b). This is of interest internationally because of the potential interference of bottle feeding with optimal breastfeeding practices, and the association between bottle feeding and increased morbidity and mortality from diarrhoeal disease (from poor hygiene and unsafe water supplies) (WHO 1991b). The NHMRC policies in Australia do not specify clearly the recommendations concerning the use of bottles but do encourage feeding of expressed breastmilk, which is usually given in a bottle. Moreover, the recommended definition of exclusive breastfeeding by WHO includes the feeding of expressed breastmilk in a bottle. Thus, the interpretation of a bottle feeding rate, as an indicator of practice, would be confusing in Australia (as some bottle feeding is consistent with current recommended practice).

Timely complementary feeding is a key indicator of WHO. The rationale for the indicator has been described as “a basic simple indicator of feeding patterns among children in the age group 6-9 months”. There are two aspects of the indicator; the first is ensuring that children in this age range are receiving at least some solid food, and the second is that breastfeeding is continuing beyond 6 months. WHO acknowledges that the indicator is complex to interpret, and that it does not assess the sufficiency or the quality of the solid foods introduced (WHO unpublished). In developing countries, a delay in introduction of solid foods is common and influenced by poverty. In industrialised countries, the risk for the general population is more likely to be the introduction of solid foods before the age of 6 months, which is of concern because it replaces breastmilk as a source of nourishment, and reduces the potential dose of breastmilk for immunological protection. Thus, the relevance and usefulness of the WHO indicator to Australia’s situation is not large, although it may be of relevance in some socioeconomically disadvantaged groups. The proportion of **infants receiving solid foods (before the recommended ages of 4 to 6 months)** would provide useful information to monitor in Australia, and could be calculated with the information recommended for collection concerning exclusive and predominant breastfeeding.

The **timing of introduction of breastmilk substitutes** is also of interest in Australia, because of the common practice of introducing these before the age of 6 months, noted in many studies of infant feeding. This indicator would give a picture of the extent and timing of use of breastmilk substitutes, as distinct from solid foods, and can be calculated from the information collected concerning exclusive and predominant breastfeeding.

As discussed in chapters 3 and 4, breastfeeding at hospital discharge is often used as a proxy for successful establishment of breastfeeding, as the latter is difficult if not impossible to define and to measure. It has been used in previous Australian surveys as a measure of success in promoting early breastfeeding. However, the postnatal hospital length of stay has been decreasing steadily over the past two decades. Many women are now discharged within 3 days of the birth, well before breastmilk supply has been established, and feeding decisions made. This short stay is in contrast to the growing minority of women who have Caesarean births and whose hospital length of stay is 7-10 days. Thus, the great variation in timing of hospital discharge between types of births and various facilities, along with the changes in length of stay over time makes this a difficult indicator to interpret at the population level. As noted in section 4.1, WHO recommends a separate facilities-based monitoring system in which breastfeeding rates at hospital discharge, along with other indicators are measured over time with a view to improving health facility policies and practices.

4.4 Conclusions

Based primarily on the criteria of policy relevance, the WHO indicators for assessing breastfeeding practice, as described in box 4.2, are largely suitable, with some modifications and additions for application in Australia. How the relevant indicators are to be operationally defined, and which methods should be used to measure them is discussed in chapter 5.

5 Issues and recommendations in measuring indicators of breastfeeding practices in the Australian population

Previous chapters summarised the conceptual definitions of breastfeeding and the issues for standardising terminology in Australia, as well as the policy basis for selecting indicators to monitor breastfeeding practices. As outlined in chapter 4, a set of key indicators for monitoring infant feeding practices in Australia does not exist. The indicators recommended by the WHO (1991b), however, provide a suitable basis for adapting indicators for Australia; criteria for selecting/adapting the WHO breastfeeding indicators for Australia were outlined.

In this chapter, the operational definitions of indicators are discussed, together with the implications for specific information that should be collected, and how it should be collected. In light of the data requirements, the current data sources for relevant breastfeeding indicators in Australia are then reviewed. Methodological issues, which need to be considered in selecting from alternative measurement methods, are discussed, and the chapter concludes with recommendations regarding measurement methods in the Australian context.

The importance of selecting appropriate methods for measuring indicators has been highlighted by WHO. In a recent assessment of the quality of global data about breastfeeding, WHO identified three main limitations: i) surveys/studies with unrepresentative non-random samples and poor response rates, ii) ad hoc surveys that are not repeated, and iii) measurement error/non-comparability resulting from a lack of standardisation of questions, definitions, and administration of questionnaires (WHO unpublished). These same limitations were noted in a recent review of breastfeeding prevalence studies in Italy, where reported rates ranged from 17-52% at 4 months of age (Cataneo et al 2000). Real differences in prevalence were impossible to distinguish from differences due to sampling, survey methods, and definitions of breastfeeding.

The WHO indicators, proposed to monitor Australian policy recommendations are:

- The WHO indicator for percent 'ever breastfed'.
- Exclusive and full breastfeeding rates to 6 months of age to coincide with anticipated changes in the Australian policy. Full rather than predominant breastfeeding has been selected for the indicator, because the concept of 'full breastfeeding' appears to be more readily interpretable than 'predominant breastfeeding'. The rate of predominant breastfeeding can be derived by subtracting the percent exclusively breastfeeding from the percent fully breastfeeding.
- The percent who were breastfed at each completed month of age to 12 months, in order to determine prevalence of breastfeeding at various time points of interest during infancy, shifts in the point in time when major declines occur, and to provide states and territories with sufficient information to monitor progress towards their breastfeeding targets.
- Median duration of breastfeeding, among 'ever breastfed' children, to distinguish between changes in duration of breastfeeding vs change in initiation rates.

- Percent of infants receiving solid foods at each month of age to 6 months to replace the WHO indicator of timely complementary feeding.
- Percent of infants receiving breastmilk substitutes at each month of age to 6 months.

5.1 Key data elements of breastfeeding indicators

Data elements are discrete items of information or variables that may be used to calculate an indicator (AIHW NHDC, 2000).

In the operational definitions of WHO indicators, the key data elements are the age of the child, the number of children surveyed who have been fed according to the specified breastfeeding practices at the specified ages (or within the ranges), the total number of children at the specified ages and the duration of breastfeeding or other specified infant feeding practice.

- The key data elements for the proposed Australian indicators would include:
 - detailed information about current infant feeding practices, to allow breastfeeding practice to be categorised in terms of the different intensities described in the 'Definitions' section, (that is exclusive breastfeeding, predominant breastfeeding, full breastfeeding, or (any) breastfeeding, and time of introduction of breastmilk substitutes and solid foods;
 - accurate information about the age of the infant at the time to which the infant feeding practice relates; and
 - the total number of infants and children within the reference age included in the survey sample and the total number with particular practices.

The WHO standardised definitions of breastfeeding terms have been used as the basis for defining the data elements of the WHO breastfeeding indicators and are proposed for use with Australian indicators (refer chapter 3).

5.2 WHO recommendations on data sources

5.2.1 Questions about current practice

The operational definitions of WHO breastfeeding indicators require the collection of data relating to current feeding regimen, ie during the 24 hours prior to the survey. Sample questions, for use in surveys on breastfeeding indicators are supplied (box 5.1). From responses to these questions, rates for most WHO breastfeeding indicators can be calculated. These questions are relevant for use in Australia to measure indicators of current practice relating to breastfeeding intensity, introduction of solids and breastmilk substitutes.

Box 5.1 WHO sample questions for use in surveys on breastfeeding indicators

For each child less than 24 months old ask the respondent	
1. Can you tell me how old the child is today?	
If possible, the exact date of birth is.....	
2. Since this time yesterday, has (name) been breastfed?	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 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

5.2.1 Age of infant/child

These indicators require information about the age of the child (in months) at the time of the survey in order to calculate the numerators (number of survey infants/children who are being fed as specified and at particular ages outlined in the indicator), and the denominators (the number of survey infants/children at particular ages). WHO uses the term “infant” up to but not including 12 months of age, and “children” for those at or greater than 12 months of age.

The simplest and most reliable way to collect data on age is to ask respondents for birth dates (WHO 1991). Once birth date is established, the age in complete months, or decimal age of infants (particularly useful for those less than 1 month) can be calculated. The WHO guidelines calculate age of infants in days, and of children in completed months.

5.2.2 Repeated cross sectional survey ‘vehicle’

The WHO indicators were designed specifically for the cross-sectional household surveys, commonly used in developing countries, to obtain health-related data from households. WHO notes that repeated cross-sectional surveys are the usual method for collection of data about infant feeding practices throughout the world (WHO 1991b). Demographic and Health Surveys (DHS) are used as the main survey ‘vehicles’ on which breastfeeding data are collected. These surveys are regarded as the most reliable national household level sources of data for monitoring infant feeding practices (among other health related practices) and are conducted regularly in at least 60 developing countries. These surveys use standardised methods for household sampling, questionnaire content and administration, and protocols for training interviewers. The intention of the WHO is that the DHS will be repeated every five years.

5.2.3 Random population/household sample

WHO notes that random sampling of households and/or individuals within households that meet the eligibility criteria is the preferred method to obtain representative national data about breastfeeding. The WHO indicators prescribe a sampling frame to include all children in a household aged less than 2 years. This age range was defined because it covered all indicators, including the rate of continued breastfeeding to 2 years.

5.2.4 Mode of collection

The mode of collecting information about breastfeeding practice is not prescribed by WHO. However, the DHS survey program utilised by WHO for collection of breastfeeding data (described above) relies on interviewer administered questionnaires conducted in the subject’s home.

5.3 Review of recent Australian data sources for breastfeeding indicators

This section reviews the breastfeeding information collected in recent Australian national surveys and how the information aligns with the data requirements outlined above for reporting on relevant breastfeeding indicators for Australia. The Australian Bureau of Statistics’ NHS program is the main data source for information about breastfeeding in Australia. In 1989-90, the first NHS (89-90 NHS) to include questions about breastfeeding was conducted (ABS 1991 a, b). Since then, two further surveys have been conducted, in 1995 (95 NHS) and in 2001 (ABS 1997). In 1994, the ABS conducted a National Aboriginal and Torres Strait Islander Survey (94 NATSIS) which included questions about breastfeeding (ABS 1995, 1996c). The two complete National Health Surveys and the NATSIS survey are included in the review that follows.

Information about breastfeeding is also collected in some states and territories. These surveys are not reviewed here, although the same principles apply if states and territories wish to compare their data with national samples.

5.3.1 Coverage of indicators by survey questions (breastfeeding practices, age)

Table 5.1 shows the questions asked in each of the surveys relevant to breastfeeding. Details of the response categories are shown in appendix 4. The responses to these questions provide some, but not all of the information required to report on the relevant indicators for Australia. Most information was not collected in the same way as the WHO indicators, so indicators calculated from historical Australian data would not be directly comparable. The extent to which the surveys collected information related to each indicator is summarised below:

- Exclusive breastfeeding among infants at each month of age to 6 months: Not covered (did not ask questions about water, juice or other fluids) and did not ask about current practice.
- Full breastfeeding among infants at each month of age to 6 months: Partly covered (95 NHS did not ask sufficient questions to distinguish between predominant and exclusive, and did not ask about current practice. However, can calculate a rate for “full breastfeeding” based on recalled data (up to four years) which comprises an overall rate encompassing exclusive and predominant - see chapter 3).
- Percent breastfeeding among children at each month of age to 12 months: Can be calculated from 95 NHS (based on recalled data of up to 4 years).
- Ever breastfed: Can be calculated from 95 NHS, 94 NATSIS (Cannot calculate rate from 89-90 because mother was the unit of analysis and data were not collected on each of her children age 5 and under; the ‘ever breastfed’ rate from these two surveys may be slightly underestimated as respondents were not prompted to report single occasions of breastfeeding, or feeding expressed breastmilk).
- Median duration of breastfeeding among ‘ever breastfed’ children: Can be calculated from 95 NHS survey. The long recall period of up to 12 years for NATSIS limits the accuracy and comparability of data from this survey.
- Percent of infants receiving solid foods among infants at each month of age to 6 months: Cannot be calculated from 95 NHS, because data were not collected about current practices. A rate based on recalled data (up to four years) can be calculated from 95 NHS.
- Percent of infants receiving breastmilk substitutes among infants at each month of age to 6 months: Cannot be calculated from 95 NHS because data were not collected about current practices. A rate based on recalled data (up to four years) can be calculated from 95 NHS.

The questions used in recent Australian surveys have not been consistent in defining the breastfeeding aspects of interest, which are comparable with previous surveys or with international indicators. The WHO operational definitions all rely on survey questions about current (yesterday’s) feeding practices, yet none of the Australian questions have done so. The exception was that mothers in 1995 were asked whether any of their children (within the defined ages of the sample frame) were still breastfeeding at the time of the survey. For information about most of the indicators, mothers were

asked in each survey to recall/report on their feeding practices during their child's early infancy. The recall period varied between the surveys from less than 4 to 12 years. Thus, although some Australian information is available for the WHO indicators, it is not comparable because of the difference in current versus recalled practice. See subsequent section for discussion.

Details of the survey methods are shown in table 5.2. Dates of birth of the infants and children participating in these national surveys were not obtained for the 89-90 NHS or 94 NATSIS. In 1995, the date of birth was obtained for each member of the household but that information was not retained/linked to the breastfeeding information. In all surveys, age was assessed from mothers'/carers' reports of the age of the child, reported in months and rounded down by interviewers to the nearest completed month. Children aged less than one month were grouped as such. It is notable that 20% of the respondents in the 95 NHS were not the mother, but another member of the household, which could have affected the accuracy of reporting of age, as well as feeding practices.

Lack of precision in determining age from reports of age rather than date of birth is discussed further in the "issues" section later in the chapter. The main implication is that reporting rather than calculating age introduces measurement error in the calculated rates of breastfeeding practices at particular ages (due to approximation and rounding of ages), and this error could be prevented.

Table 5.1: Questions used in the 1989-90 and 95 NHS, and 1994 NATSIS relevant to selected breastfeeding indicators

Survey	Initiation, including ever breastfed	Breastfeeding duration x intensity - exclusive, predominant, full or any	Complementary feeding
1989-90 NHS	Are you breastfeeding or have you breastfed your child or children who are currently aged 5 years or less?	Please write down the ages of each child aged 5 years or less. Please write down the number of months you breastfed or have been breastfeeding your child or children.	
1994 NATSIS	Was ... breastfed? (distinguishes between currently and previously in the response categories)	If yes, how long was breastfed for?	
1995 NHS	Has ... ever been breastfed? Is ... currently being breastfed? Was ... breastfed when ... first came home from hospital?	Has ever been given infant formula regularly? At what age was ... first given infant formula regularly? Has ... ever been given cow's milk regularly? At what age was ... first given cow's milk regularly? Apart from breastmilk/infant formula/cow's milk has ... ever been given any (other) type of milk substitute on a regular basis? What type of milk substitutes did have? At what age was ... first given (this/any of these) milk substitutes regularly? Has ever been given solid food? At what age was ... first given solid food regularly? Including times of weaning, what is the total time was breastfed?	Has ever been given infant formula regularly? At what age was ... first given infant formula regularly? At what age was ... first given solid food regularly? At what age was .. first given cow's milk regularly?

The ABS releases information about breastfeeding intensity that is derived from the questions on current age (recorded in months if less than 1 year), was breastfed, age when first regularly given anything other than breastmilk and total time breastfed.

Table 5.2: Selected characteristics of the 1989–90 and 95 NHS, and 1994 NATSIS

	1989-90 NHS	1994 NATSIS	1995 NHS
Total sample size (number)	56,803	~17,500 Indigenous persons	53,751
Response rate (%)	83.9	90	91.5 (unweighted)
Survey design	Multi-stage area sample	Multi-stage area sample stratified by 35 ATSI regions and Torres Strait areas	Multi-stage area sample
Survey coverage	Urban and rural areas across all States and Territories	Remote, rural and urban areas in all States and Territories	Urban and rural areas across all States and Territories
Enhanced state sample	Increased in NSW, Victoria and Tasmania	—	Increased in Vic, SA, NT, ACT
Enhanced Indigenous sample	—	—	Increased by 1,000
Duration of survey	October 1989 – September 1990	April – July 1994	February 1995 – January 1996
Geographical coverage	Usual residents of selected private dwellings and non-private dwellings	Usual residents of selected private and non-private dwellings including homeless people and people in prisons	Householders in private dwellings and certain non-private dwellings
Sampling unit	Household based collection	Household based collection	Household based collection

Characteristics of the sub sample who were asked breastfeeding questions

Age of children for which information about breastfeeding was collected	5 years and under	12 years and under	3 years and under, (ie <4 years)
Sample size for which breastfeeding information was collected	2,685 mothers	Not specified	3,252 children
Respondent who provided information about the child	Women who completed the Women's Health Questionnaire	Adult responsible for the child	Mother in approximately 80% of subjects
Age of child obtained and recorded in	Mothers report in months (date of birth not obtained)	—	Mothers report in weeks or months, (Date of birth not utilised to derive age)
Information obtained by	Self-completed questionnaire	Trained ATSI interviewers, where possible	Trained ABS interviewers

Sources:

1. ABS 1991a. 1989–90 National Health Survey: User's guide. ABS Catalogue No 4363.0, Canberra, Australia
2. ABS 1995. National Aboriginal and Torres Strait Islander survey 1994: Detailed findings. ABS Catalogue No 4190.0, Canberra, Australia
3. ABS 1996c. National Health Survey User's guide, Australia 1995. ABS Catalogue No 4363.0, Canberra, Australia

5.3.2 Repeated cross sectional survey 'vehicle'

The Australian Bureau of Statistics' NHS program is the main data source for information about breastfeeding in Australia and meets the requirements of a large, nationally representative cross sectional health survey of Australian households, repeated at approximately 5 yearly intervals. The 2001 NHS recently completed, will give information comparable to that collected about breastfeeding in the 1995 NHS.

The value of using a survey vehicle which will be repeated at predictable intervals is that trends can be established. Although the NHS has been repeated, the differences in the characteristics of the sub-sample for measuring breastfeeding (mothers versus children) and coverage/measurement of the breastfeeding indicators between the 89-90 and 95 NHS limit the comparability of these two surveys, so that trend data are still not available. It is anticipated that the 2001 NHS will supply comparable breastfeeding data to that collected in 1995 and will enable a comparison between these two surveys for some indicators of breastfeeding.

There are no plans to repeat NATSIS, however the ABS is considering conducting a General Indigenous Social Survey every six years. This would provide a vehicle for monitoring breastfeeding in Aboriginal women and Torres Strait Islander women, and reporting trends in different populations.

5.3.3 Random population sample

All three Australian surveys were conducted by the ABS. The National Health Surveys utilised stratified weighted random household sampling procedures. The sub-sample for inclusion in the breastfeeding component varied substantially between surveys, as shown in table 5.2, defined as mothers in one survey, and children in the other two. The ages of eligible children varied from less than 4 years to 12 years. The lack of consistent eligibility criteria limits the comparability of data from these surveys.

In all surveys the sample of households was large, and the sample of infants and children was greater than 2000. The overall response rates for participation were high, greater than 80%.

5.3.4 Mode of collection

As shown in table 5.2 questions about breastfeeding were interviewer-administered (face to face) in the 1995 NHS and the 1994 NATSI survey, by trained ABS or Aboriginal and Torres Strait Islander interviewers. In the 1989-90 NHS, women completed a self-administered questionnaire.

Other options for collecting data are telephone or clinic interviews. A system for conducting regular telephone surveys (Computerised Assisted Telephone Interviews or CATI surveys) of a random selection of households is now in place in most states and territories in Australia, and information about breastfeeding practices has been successfully collected in at least one state.

Evidence suggests that interviewer administered dietary assessments are superior for obtaining higher response rates and complete data from respondents, provided that interviewers are well trained, and interview procedures are standardised and monitored (Thompson and Byers 1994).

5.3.5 Summary of review of Australian data sources

Breastfeeding data collected in recent national surveys in Australia aligns to some extent with WHO breastfeeding indicators considered relevant to Australia, but the lack of a consistent and standardised approach to defining and measuring breastfeeding practices limits Australia's capacity to calculate rates that are comparable internationally and within Australia over time. However, the review also shows that adopting the WHO indicators presents some issues and trade-offs, the main ones being related to the wording of the survey questions, measurement of current practice (previous 24 hours) versus retrospective (recalled) breastfeeding practice, the age range of the children, and the choice of survey vehicles for breastfeeding monitoring. The next section considers these in turn.

5.4 Issues considered in making recommendations

5.4.1 Survey questions

The following steps need to be undertaken before a set of survey questions for routine use can be recommended.

1. Development/adaptation of questions to supply the necessary data elements and requirements as outlined in the recommended indicators.
2. Cognitive testing of questions to ensure that they are clearly understood.
3. Evaluation of question performance, particularly in relation to relative validity and consistency among population sub-groups.

Steps 2 and 3 will need to be undertaken before finalising a set of breastfeeding questions for routine use in Australian surveys and studies, but are beyond the scope of this report. The ABS usually undertakes cognitive testing of questions during the pilot phase of its surveys, and so its processes would ensure that the questions “work” in the Australian population (in the sense that the respondents understand the questions and can respond appropriately). Assessment of the relative validity needs to be conducted in the context of a survey or special validation study.

With regard to steps 1 and 2, the earlier discussion shows that the survey questions currently in use in Australia do not provide the range of data elements that are needed to report on the set of indicators identified as most relevant to Australia in chapter 4. For example, questions about ever breastfeeding do not probe adequately to cover all practices within the definition of ever breastfed. Similarly, questions about intensity of breastfeeding do not ask specifically about all liquids so that exclusive and predominant breastfeeding can be distinguished.

The WHO question in box 5.1 would provide most of the required data elements for the proposed indicators relating to intensity of current breastfeeding. Additional questions to assess the proportion who recall ever breastfeeding, and the total duration of breastfeeding would be needed to satisfy the data requirements. The adoption of the WHO question for use in Australia is based on the premise that for breastfeeding intensity, measurement of current practice is preferable to recalled practice (see below).

5.4.2 Current breastfeeding practice versus retrospective (recalled) practice

Measurement error from inaccurate reporting by mothers can arise from poor recall of infant feeding practices and/or the desire to give socially 'acceptable' responses. To minimise error from recall, WHO recommends the collection of current breastfeeding practice (feeding in the last 24 hours) rather than retrospective or recalled practices. This is based on evidence that suggests mothers' recall of duration of exclusive and predominant breastfeeding, and commencement of complementary feeding may be inaccurate, particularly over relatively long periods of time.

The accuracy of mothers' reports of infant feeding practices recalled over relatively short times (1-3 years) and over long periods (14-22 years) has been investigated by comparing recalled practices with clinic records kept by nurses who questioned mothers about their feeding practices during early infancy (Eaton-Evans and Dugdale, 1986, Launer et al 1992, Tienboon et al 1994, Kark et al 1984).

Results of these studies show that mothers recall/report accurately that they 'ever breastfed'/initiated breastfeeding and the duration that they breastfed. Accuracy of recalled duration was higher in the two studies where the period of recall was relatively short (12-18 months in one study, and 3 years in another) than in the studies with longer recall periods eg 14 years and 20 years (respectively, Eaton-Evans and Dugdale 1986, Launer et al 1992, Tienboon et al 1994, Kark et al 1984). In the studies with shorter recall periods, the majority of mothers (>80%) recalled the duration of breastfeeding to within 1 month of that noted in clinic records and the variance was relatively low. With longer recall periods, the majority of mothers could recall the duration of breastfeeding to within three months of the clinic record.

These studies with both shorter and longer recall periods have found that recall of 'when infants were first given a breastmilk substitute', and 'solid foods' were less accurate than recall of the duration of breastfeeding. Just 58% in one study reported the age of first formula or other milk to within one month of that noted in clinic records (Eaton-Evans and Dugdale 1986). Just under two-thirds of women correctly classified themselves as having introduced solids when infants were aged less than 3 months, 3-6 months, or older than 6 months (Tienboon et al 1994).

The implications from these studies is that indicators of 'ever breastfed', and duration of breastfeeding can be measured relatively accurately from mothers' retrospective reports of feeding practices recalled over short periods (eg up to 3 years). However for indicators about the timing of introduction of solid foods, or the intensity of breastfeeding (exclusive, predominant or full) and the duration of these, recalled information is unlikely to be sufficiently accurate to detect differences smaller than two to three months.

Evidence that mothers "round" their reports of duration of breastfeeding at particular points is seen in the "heaping of data in multiples of 3 and 6 months" particularly when the recall period is over several years (O'Gara et al 1995).

An alternative to retrospective data is to ask mothers about their current infant feeding practices, eg during the past 24 hours. This is the assessment method recommended by WHO, acknowledging the successful use and the validity of 24 hour recall methods to document the dietary intakes of groups (WHO, 1991b). The collection of data about current breastfeeding practices (feeding practice in the last 24 hours), widely used in national surveys and is recommended by WHO to minimise error from recall. This appears particularly important for indicators of exclusive/predominant breastfeeding.

Measurement of current practice for exclusive and predominant breastfeeding does not necessarily reflect feeding practices since birth. Aarts and colleagues found that among young infants, estimates of exclusive breastfeeding based on yesterdays' practice were considerably higher than rates of exclusive breastfeeding since birth, primarily due to the practice of giving water on some days (Aarts et al 2000). The authors recommend that for population monitoring, measurement of current practice may be all that is feasible, but the appropriate interpretation of the indicator should specify that the rates are based on current practice, and do not imply that these infants have been exclusively breastfed since birth.

Three options were considered in making recommendations about breastfeeding intensity among infants to 6 months of age:

1. Base the indicators on questions about current practice only (in the last 24 hours)
2. Base the indicators on questions about recalled practices, but limit the survey sample to those less than 12 months, to minimise the recall period
3. Base the indicators on BOTH current practice, and recalled practice and report rates **separately**

In the discussion paper, it was recommended that the rates be measured and reported both ways (option 3). However, the weight of input from key stakeholders supported measurement of current practices (option 1) because of its greater accuracy, and to minimise/simplify the number of indicators and data requirements. The small sample size of infants aged 6 months or less 'captured' in most population surveys is the key disadvantage of this option (see discussion below).

5.4.3 The survey vehicle/data sources and sampling

The major potential data sources for monitoring breastfeeding include:

- surveys conducted by the ABS, principally the National Health Survey and the National Nutrition Survey;
- surveys initiated by State and Territory governments, including CATI surveys;
- routinely collected data from institutions and community health services (eg from Child Health Clinics); and
- cohort studies.

These are considered in turn.

The NHS program meets the general requirements for supplying the necessary data for calculating breastfeeding indicators. However, whether it is the appropriate survey vehicle for breastfeeding monitoring requires consideration and confirmation. The issues are whether this survey a) can include all of the questions and conduct the analyses required to report on the proposed indicators, b) gives a sufficiently large sample of infants to provide meaningful national estimates, and is capable of detecting changes in rates of the order that may occur from interventions and other influences, over the usual five-year period between surveys.

The main limitation of using general population health surveys to monitor breastfeeding practices is the relatively small sample of infants within the age range of interest that are usually recruited through household and other random population sampling methods.

The potential sample size obtained from population surveys is affected by the age range of children to be included in the sub-sample among whom breastfeeding practices are to be assessed. For example, in the 1995 NHS, a total of 21,787 households were surveyed. In this survey, households were eligible to answer the breastfeeding questions if a child of less than 4 years lived there, giving a sub-sample total of 3,252 households/children. A sample of this size appears reasonable for obtaining recalled data and calculating indicators relating to 'ever breastfed', 'median duration of breastfeeding', and 'percent breastfed at each month of age to 12 months'. If the sub-sample were redefined as children less than 2 years of age (to minimise error from recall and to coincide with WHO sample definition), a reasonable sample size would still be obtained. In the 95 NHS, more than 1,500 children were less than age 2 years.

However, if data on current feeding practices (in the last 24 hours) are required for calculating indicators of exclusive, full, (and predominant) breastfeeding among children at each month of age to 6 months, the sample size of infants within this age range will be considerably smaller. Of the 3,252 children less than age 4 years in the 1995 NHS, only 378 were less than 6 months old. Point prevalence of exclusive or predominant breastfeeding at age 4 months and 6 months would thus be based on extremely small sample sizes of children precisely at those ages ie for some ages, less than 50 infants.

A considerably larger (than 378) sample of infants aged 6 months and under would be required to be able to detect a modest but statistically significant difference in national prevalence of exclusive or full breastfeeding rates between surveys. For example, the 1995 NHS point prevalence rate for full breastfeeding at 6 months was 18.6% as reported by Donath and Amir (2000). An increase of 5% (from 18% to 23%) in this rate could only be reliably detected from a sample size of about 1,200 infants at 6 months of age (with a power of 80% and significance level of 5%) (Peat 2000).

Whether a sample of 300-400 infants is adequate to provide nationally representative data on exclusive and full breastfeeding rates depends both on the sampling methods used and the variation in breastfeeding practices. The Australian NHS uses stratified weighted random household sampling procedures and includes ~0.3% of the Australian population of infants less than 6 months of age - (Census 2000). However, because of the very limited age range, the actual sample size of young infants captured in this survey is only small. Thus, even with large national surveys, there is a trade-off between the potentially improved accuracy of data collected about current practice but a marked loss in precision with potentially greater measurement error due to reliance on retrospective data recalled over as many as 3 years, but a larger sample which affords greater precision. The same sample size limitations will generally also apply to other household surveys conducted at the national level or by State and Territory governments. However, they may be overcome in situations where it is possible to have over-sampling of households with young children, or if the survey vehicle is changed so that there is a rolling household survey, and consequently the possibility of accumulating larger sample sizes over a period. These considerations apply equally to CATI surveys.

An alternative to the cross-sectional survey is repeated birth cohorts, in which data about infant feeding are collected soon after birth, and at points throughout early infancy. Such a survey design is robust for the purpose, and creates the potential for recruiting large samples of infants within the reference age of interest. The main limitation of cohort designs is their expense, which arises from tracking members of the cohort. This design has been used to collect information about breastfeeding from mothers attending child health clinics and centres, but the 'response rates' after the first 3 months tends to drop substantially, as members of the cohort no longer attend the clinics.

The feasibility of regular, repeated birth cohorts is low given the usual resource constraints for nutrition monitoring. However, if ad hoc birth cohort studies collect data using methods comparable to those in cross sectional national surveys, a contribution can be made to the picture of breastfeeding. Cohort studies are particularly useful for reporting on breastfeeding practices among population sub-groups because of the potentially larger samples obtained.

Given these considerations the most likely data sources for monitoring breastfeeding are large scale cross-sectional health surveys, including the ABS health survey program, the National Nutrition Survey, if repeated, and the state CATI surveys. The recommendations are designed for implementation in this context.

It is also proposed that consideration be given to establishing a regular purpose-specific infant and child health and social survey program in Australia, which could provide a more appropriate survey vehicle for collection of more detailed data about breastfeeding, and other infant feeding practices.

5.4.4 Age of children to be included in the questions on breastfeeding

There has been no consistency across recent Australian surveys in the eligibility criteria (age of children) for calculation of breastfeeding indices from the surveys. The 1995 and 2001 National Health Surveys included all children under age 4 years, the 89-90 NHS included children aged 5 years and under and the NATSIS survey of indigenous Australians included children aged 12 years and under. Clearly, it is essential to standardise the eligibility criteria, to ensure comparability between surveys over time.

The reference age range for two kinds of indicators needs to be defined. Indicators of breastfeeding intensity (including solid foods and breastmilk substitutes) are of interest only among infants up to age 6 months, because after this age, most infants are, and should be fed complementary foods. The reference age range for measuring these indicators based on current practices should thus be infants 0-6 months of age.

For indicators relating to initiation and duration of breastfeeding based on recalled practices, two options have been considered.

Option 1: Standardise the sample frame to all children less than 4 years as has been used in the 1995, and 2001 National Health Surveys.

Option 2: Reduce the eligible age range to children aged 2 years or less.

The principal advantages of option 1 are the larger sample size (important in state and territory CATI surveys) and maintaining the comparability with previous NHS surveys (although earlier measurements were not strictly comparable with the methods proposed for the new indicators). The main advantage of option 2 is that it requires a shorter recall period.

Option 1 has been recommended in this report because the literature supports the view that mothers can recall reasonably accurately over several years whether they ever breastfed and the total duration of breastfeeding and because this age range is consistent with that used in two previous surveys.

WHO recommends the inclusion of all children within the age range, rather than selecting the last born or first born, because breastfeeding is known to vary by birth order and parity and thus, biased data will be obtained by selection of children on these characteristics (WHO 1991b).

5.4.5 Data analysis methods

In section 5.4.3, the issue of relatively small sample sizes of infants 'captured' in large population health surveys, such as the National Health Survey in Australia, has been outlined. For breastfeeding indicators requiring estimates at each month of age, there are likely to be small numbers at these precise ages, giving potentially unreliable estimates. There are various methods to deal with/increase the sample size for calculation of the indicators and three options are outlined below.

Option 1: Calculate indicators on data grouped for an age range (eg 0-4 months), rather than calculated for infants/children at a precise month of age.

Option 2: Calculate age-specific rates (at each completed month of age) by including data on feeding history for each child using a survival analysis approach such as Kaplan Meier (Mackerras, personal communication). Thus, an infant/child can contribute information for more than one time point. For example, a child who has been breastfed to 6 months, was also likely to be breastfed at one month, two months, three months, four months and five months of age, and therefore contributes to the age specific rates at each of these ages.

Option 3: Calculate age-specific rates at each completed month of age, using data only for infants/children at those precise ages.

The main advantages of option 1 are that it accumulates a larger sample size for calculation of the indicator, and is relatively simple to calculate. However, indicators calculated for an age range lack precision and do not specifically answer many of the policy questions of interest. For example, the percentage of infants exclusively breastfed to the recommended 6 months cannot be assessed from an indicator calculated on the percent of infants aged 0-6 months who were exclusively breastfeeding. Infants who have only reached two months of age at the time of the survey may be currently exclusively breastfeeding, but it cannot be assumed that this infant will be exclusively breastfed to 6 months. Therefore the calculation of a 'grouped rate' will overestimate the proportion of infants meeting the NHMRC policy recommendations. Moreover, using this method, it will not be possible to identify the month(s) of age, when the greatest declines in exclusive breastfeeding occur.

The main advantage of option 2 is the increase in sample size for each of the age-specific rates obtained by taking advantage of all the data available on an infant/child's feeding history. There are two disadvantages. One is the increased complexity in calculation of the indicators (requiring methods to select/classify each infant/child for calculation of each of the age-specific rates). The second is that an assumption must be made that if a child is breastfed currently, it was also breastfed at all previous months of age. This assumption appears to be valid for any breastfeeding, but may not be so for exclusive or full breastfeeding, as discussed in section 5.4.2. For example, a 5-month old infant who was exclusively breastfed in the previous 24 hours to the survey, may not have been exclusively breastfed at two months or three months of age.

The main advantage of option 3 is that it is straightforward to calculate and makes no assumptions about feeding history. The main disadvantage is that the sample sizes of infants/children at precise months of age are likely to be small, giving potentially unreliable estimates with wide confidence intervals, and limiting the capacity to detect significant change over time.

Option 2 has been recommended in this report for indicators based on recalled practices, percent breastfed at each completed month of age to 12 months, and median duration of breastfeeding, because of the increase in sample achieved for each of the age-specific estimates, and the likelihood that children breastfed to a particular month of age, were also breastfed prior to that.

Option 3 has been recommended in this report for indicators of (current) exclusive and full breastfeeding, introduction of solids and breastmilk substitutes. Although the sample will be small at each month of age, the estimates are likely to have greater validity and precision than if calculated by the other methods.

Appendix 6 illustrates how each of the indicators is calculated using a hypothetical data set similar in size to the 1995 National Health Survey.

A related issue requiring attention in calculating indicators from survey data is the potential problem of unreliable age-specific estimates due to 'data heaping', in which mothers may recall/round their responses to questions about the total time breastfed to particular months/years, eg 6 months vs 5 or 7 months, 12 months vs 11 or 13 months, etc (O'Gara et al 1995). Data heaping is likely to be more of a problem for reporting longer duration of breastfeeding, eg greater than 12 months (breastfeeding for longer than 12 months is uncommon in Australia).

An option for dealing with unreliable age-specific estimates due either to 'data heaping' or to very small sample sizes, is to utilise statistical smoothing procedures such as calculating a line of best fit, or a trendline, or calculating a 3-year moving average, as a basis for adjusting the unsmoothed prevalence rates (Mackerras, personal communication, WHO 1991b).

5.5 Recommendations

Based on the considerations above and the views of key stakeholders consulted, the following are recommended.

5.5.0 Proposed standardised definitions and indicators

- A. The proposed breastfeeding indicators and definitions of terms for use in monitoring the Australian population, and the rationale for these are described in detail in chapter 6. Once pilot tested and refined, the indicators should be monitored and reported on a regular basis, for population subgroups, also as outlined in chapter 6.
- B. Indicators to meet international reporting obligations to the WHO Global Data Bank on breastfeeding are proposed in appendix 7 and should also be reported on a regular basis.
- C. Standardised core indicators to monitor hospital and health facility practices related to breastfeeding promotion need to be developed as part of a process to develop and maintain a national system to monitor breastfeeding (see recommendation 5.5.7 F).

5.5.1 Age of children to be included in the sample for calculation of indicators

- A. For indicators of ‘ever breastfeeding’ and duration of (any) breastfeeding, the reference age range of 0-<4 years is recommended
 - While restricting the sample to <2 years, or <3 years, as per WHO, may give an adequate sample for monitoring at the national level based on the national surveys such as the National Health Survey, this is unlikely to be the case for smaller surveys, such as the CATI surveys being conducted by the states and territories. It is also unlikely to be adequate for considering breastfeeding habits in population subgroups. The indicators should be suitable for various purposes and use in a variety of settings. This age range provides consistency with the 1995 and 2001 National Health Surveys. Thus the larger age group is recommended.
- B. For indicators of breastfeeding intensity (exclusive and full breastfeeding), introduction of solid foods and breastmilk substitutes, the reference age range of 0-6 months is recommended
- C. The sample should include all infants/children within the reference age range (ie not restricted to first/last born, or only those who have stopped breastfeeding to minimise bias)

5.5.2 Use of current breastfeeding practice versus retrospective (recalled) practice

- A. The following indicators should be calculated based on recalled practices:
 - Percent ‘ever breastfed’
 - Percent breastfeeding among infants at each completed month of age to 12 months
 - Median duration of breastfeeding among ‘ever breastfed’ children

B. The following indicators should be calculated based on current practices (in the previous 24 hours);

- Percent exclusively breastfeeding in past 24 hours among infants at each completed month of age to 6 months
- Percent fully breastfeeding in the past 24 hours among infants at each completed month of age to 6 months
- Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months.
- Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months.
- These recommendations are supported by published evidence that mothers can recall relatively accurately the incidence and duration of breastfeeding, but recall is not as satisfactory for timing of introduction of various fluids and solids. Thus, more accurate data about breastfeeding intensity is expected from information about current practice.
- Note that the expected sample size of infants aged less than 6 months for measurement of breastfeeding intensity based on current practice will be small (150-300 infants) and will be insufficient to detect relatively small but biologically significant changes over time.

C. Although there have been several investigations of the accuracy of mothers' recall of breastfeeding practice, a validation study of the recall and current practice measurements proposed for an Australian monitoring system is warranted. This may best be done by including monthly measures and recalled measures of breastfeeding practices in a longitudinal study of infants from birth.

5.5.3 Survey questions

- A. The WHO survey question (box 5.1) can be used for measurement of current practices related to breastfeeding intensity, but additional questions will be needed to assess recalled practice of breastfeeding initiation and duration.
- B. Questions used in previous NHS surveys should be reviewed, modified and tested as a basis for assessment of recalled practices about 'ever breastfed' and duration of breastfeeding.

5.5.4 Survey vehicle/data sources

- A. For national and State/Territory monitoring it is anticipated that the main data source will be representative population surveys. The National Health Survey, CATI surveys and others would be appropriate for this purpose.
- B. The National Nutrition Survey, if repeated, would also provide a vehicle for monitoring the proposed indicators and more detailed questioning about infant feeding practices, correlates and determinants.

- C. A purpose-designed survey of maternal and infant health and nutrition would be worthwhile considering, because of the potential for a larger sample size of infants, and more survey space to focus on matters related to infant health and feeding.
- D. The recently funded NHMRC longitudinal study of infant health provides a unique opportunity to explore and pilot various questions about breastfeeding practices, and to assess their relative validity in a cohort study.
- E. The proposed indicators could also be calculated from other data sources and compared with those listed above as long as they followed the same guidelines in terms of age range, questions used, method of calculation of indicators, definitions, etc.

5.5.5 Procedures for data analysis

Recommended procedures for calculation of the indicators and data analysis are given in chapter 6 and appendix 6. In summary:

- A. For (recalled) indicators of percent breastfed at each completed month of age, and median duration of breastfeeding, calculate age-specific rates using a survival analysis approach, eg Kaplan-Meier.
- B. For (current) indicators of percent exclusively and fully breastfeeding in previous 24 hours, and consumption of solids and breastmilk substitutes, calculate age-specific rates using only data for infants who are at the precise ages of interest at the time of the survey.
- C. For all indicators, consider statistical smoothing procedures to adjust the age-specific estimates

The recommendations maximise precision when sample sizes are small, they take into account what is known about the validity of assumptions about feeding history, and they take advantage of current methods of statistical analysis that deal with many of the problems associated with using raw/unadjusted estimates.

5.5.6 Recommended next steps

- The Commonwealth Dept of Health and Aged Care establish a process/mechanism to work with agencies/individuals who collect data about breastfeeding practices to review the recommendations in this report, and seek commitment to working towards a consistent approach to monitoring breastfeeding using the proposed indicators and recommendations contained in this report as a basis for development.
- As a matter of priority, questions to measure the proposed indicators should be developed, pilot tested, refined and disseminated to all key agencies/groups collecting data about breastfeeding practices.
- Using agreed survey vehicles, national data should be collected, analysed and reported for the proposed indicators (including those to meet international reporting obligations – see appendix 7) at the earliest opportunity, eg the next NHS and National Nutrition Survey.

- A validation study of breastfeeding questions and indicators should be planned early to coincide with planning a national collaborative longitudinal study of the maternal, infant and child health.
- When a final set of questions and national breastfeeding indicators have been refined, seek to disseminate these widely to potential data collectors and users, including, registration in the AIHW National Health Data Dictionary, and the AIHW Knowledgebase
- Develop a thesaurus of culturally acceptable breastfeeding terms (which are consistent with WHO definitions) to facilitate communication of the results of breastfeeding monitoring to population subgroups and health professionals who work with them.
- Implement routine monitoring and reporting on population breastfeeding indicators, including regular review of indicators in light of future changes to infant feeding policies in Australia and internationally.
- Convene an expert group to develop core indicators of hospital and health facility practices to promote breastfeeding.
- Consider the development/funding of a national survey program to monitor maternal, infant, and child health and nutrition.

6 Proposed indicators and operational definitions for monitoring key aspects of breastfeeding in Australia

Introduction

Key data requirements

As noted in chapter 5, the key data requirements from which all of the proposed breastfeeding indicators for Australia can be calculated are:

- detailed information about infant feeding practices, to allow breastfeeding practice to be categorised in terms of the different intensities described in the 'Definitions' section below, (that is exclusive breastfeeding, predominant breastfeeding, full breastfeeding, or any breastfeeding, and time of introduction of other foods;
- accurate information about the age of the infant at the time to which the infant feeding practice relates; and
- the total number of infants and children within the reference age included in the survey sample and the total number with particular practices.

These data requirements can be met through a few survey questions. WHO has developed sample questions for use in breastfeeding surveys, from which most WHO breastfeeding indicators can be calculated. The WHO survey questions ask about any substances fed to infants in the previous 24 hours. Standardised questions asking about recalled practice have not been developed/evaluated as part of this project.

In Australia, the questions used in national surveys have varied and do not provide all the data needed to derive the indicators now proposed for Australia. The limitations of these questions in relation to the proposed indicators, are identified in sections below.

The WHO breastfeeding questions relating to current practice, and survey questions used in the 1995 NHS are shown in appendix 4. These could be the basis for questions used in Australia, but need to be modified to reflect the slightly different data needs for Australia and will require testing (cognitive testing and assessment of validity).

Proposed indicators

Indicators based on mothers' recalled child feeding practices among children aged less than 4 years

1. Percent ever breastfed
2. Percent breastfeeding at each completed month of age to 12 months (Prevalence of breastfeeding during the first 12 months)

3. Median duration of breastfeeding among 'ever breastfed' children

Indicators based on mothers' reported current child feeding practices (previous 24 hours) among infants at age less than 6 months

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months
7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

Definitions – breastfeeding (adopted from WHO 1991)

Ever breastfed/ever given breastmilk: includes infants put to the breast if only once, and includes infants who have received expressed breastmilk, but have never been put to the breast.

Exclusively breastfed: An infant is considered to have been exclusively breastfed if he/she has received only breastmilk/human milk with no other liquids or solids, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

Predominantly breastfed: An infant is considered to be predominantly breastfed if he/she receives breastmilk as the main source of nourishment, that is, with or without water, water-based drinks (sweetened and flavoured water, teas, infusions, etc), fruit juice, Oral Rehydration Solution (ORS) solution, but does not receive any other liquids (including breastmilk substitutes) or solids. Feeding of food-based fluids (except fruit juice and sugar-water) is not consistent with this definition of predominant breastfeeding.

Fully breastfed: An infant is fully breastfed if he/she receives breastmilk as the main source of nourishment. This includes infants who are either a) exclusively breastfed or b) predominantly breastfed. That is, infants can be classified as fully breastfed if a) they receive only breastmilk with no other liquids or solids (except vitamins, mineral supplements, or medicines) OR b) they receive breastmilk and water, water-based drinks, fruit juice, ORS, but do not receive breastmilk substitutes or solids. The *fully breastfed* rate is the combined rate of *exclusively breastfed and predominantly breastfed*.

Solid foods: any nutrient containing foods (semi solid or solid), this excludes fruit and vegetable juices, sugar water and breastmilk substitutes, but includes dilute infant cereals.

Breastmilk substitutes: Any milk (other than breastmilk), or food based fluid used in infant feeding as a replacement for breast milk, whether or not it is suitable for that purpose (commonly includes infant formulae, cows milk, and other milks fed to infants).

Complementary foods/feeding: any nutrient containing foods (solids or liquids other than breastmilk) given to infants who are breastfeeding.

Definitions- age

Age: calculated in completed months, preferably from birth dates.

Reference age range/period: the age range of the infants/children for whom data is obtained.

Aged at least 4 months: infants who are 4.0 or more completed months of age.

Aged at least 6 months: infants who are 6.0 or more completed months of age.

Aged at least 12 months: infants who are 12.0 or more completed months of age

Aged less than 4 months: <120 days, 0-17 weeks, 0-<4 months.

Aged less than 6 months: <180 days, 0-25 weeks, 0-<6 months.

Definitions – duration of breastfeeding

Still breastfeeding: the child is currently receiving breastmilk (direct from the breast or expressed).

Number of months the infant/child was breastfed: The total length of time, in completed months, including weaning time, that a child who has completed breastfeeding, was breastfed.

Duration fully breastfed: the age in completed months at which an infant began receiving solids or food-based fluids other than breastmilk.

Duration exclusively breastfed: the age in completed months at which an infant began receiving water, juice, other food based fluids other than breastmilk, or solids or semisolids.

Weaning completed: child no longer receives any breastmilk.

Criteria used in the selection of the proposed indicators:

- relevant to key Australian policy recommendations;
- likely to lead to policy and program action;
- consistent, where possible, with previous indicators/data collected in Australia so that trends may be documented;
- feasible/simple to collect the required information on a nationally representative sample via an ongoing health survey program;

- measurable and valid for detecting the direction and magnitude of changes over time, and differences between population sub-groups; and
- consistent with WHO wherever possible to meet international reporting obligations.

Reporting of indicators for population sub-groups

All proposed indicators are recommended for reporting in the general population. In addition, indicators should be reported on vulnerable population sub-groups (who are at risk of low breastfeeding rates), where sufficiently representative samples of these groups can be surveyed over time:

- mothers less than age 25;
- single mothers;
- mothers with no post-school qualifications;
- mothers residing in lower socio-economic areas, that is of SEIFA quintile 1;
- mothers born in countries/regions other than Australia, Oceania, Europe or America; and
- indigenous mothers

1. Percent ever breastfed

Purpose

This indicator is used to determine the percentage of infants during a reference period (all aged less than 4 years of age is recommended), who ever consumed breastmilk, whether it was once only, and irrespective of whether it was exclusive, predominant or partial. The indicator provides a measure of 'success' of current breastfeeding policies, in so far as mothers have attempted to follow current advice.

Indicator

The percent of infants *ever breastfed*.

Calculation: (The number of infants/children ever breastfed divided by the total number of infants/children in the reference age range (ie <4 years or 48 months) X 100.

Measurement issues

Evidence suggests that mothers can recall relatively accurately over several years, ever breastfeeding. Thus, a reference period of 4 years, enables the indicator to be calculated on a larger sample than if it were restricted to 12 months (as per the WHO indicator).

Questions should include definitions of "ever" to include "even once, even for a short time" and of "breastfed" to include "ever putting the child to breast, or ever giving expressed breastmilk".

Data requirements

The number of infants/children in the reference age range, (ie all aged <4 years or 48 months) at the time of the survey.

Current age of survey children in completed months, preferably calculated from birth dates.

The number of children who based on the mother's report were ever given breastmilk, or put to the breast, if only once, even for a short time.

Data sources

Cross sectional surveys of representative samples of infants and children within the sample reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

There are no previous national data sources that meet the exact definition of this indicator in Australia. However, the 1995 ABS NHS and the 1994 NATSI Survey (NATSIS) included questions which sought this information without defining it precisely for respondents.

2. Percent breastfeeding at each completed month of age to 12 months (Prevalence of breastfeeding during the first 12 months)

Purpose

This indicator gives a measure of the degree to which women have adopted the Australian policy recommendations to “breastfeed” and to continue “for at least the first 12 months” It also identifies the ages at which the greatest decline in breastfeeding rates occur during the first 12 months. Such information can be useful in planning interventions to increase the initiation and duration of breastfeeding.

Indicator

The percentage of infants in the reference age group who have been breastfed to each completed month of age to 12 months.

- **Calculation:** Infants and children who are still breastfeeding at the time of the survey are included in the calculation of the age-specific prevalence rates to avoid the bias that would occur by exclusion of this group. The calculations use a survival analysis approach such as Kaplan-Meier to estimate the percent breastfeeding at each month of age to include both those currently breastfeeding and those that have ceased, and to increase the sample size for age specific estimates by taking account of the overall breastfeeding history for each child (Mackerras, personal communication). For this, it is assumed that someone who stopped breastfeeding at a particular age was breastfeeding for all months up until the age of cessation (eg a child who stopped breastfeeding at 4 months is assumed to have been breastfed at ages 1, 2, and 3 months).
- Include all children meeting the age criterion (<48 months) for whom data on breastfeeding practices are available and arrange by age (in completed months) at the time of the survey. For each age count the total number, number never breastfed, total who had stopped breastfeeding at each age and calculate the number still breastfeeding at each age;
 - a. Commencing with calculation for age = 1 month
 - i. count the total number of children aged 1 month or older at the time of the survey
 - ii. count the number who had stopped breastfeeding by 1 completed month (those that were never breastfed plus those who had stopped breastfeeding by 1 completed month)
 - iii. calculate the number who were still breastfeeding at 1 completed month = (total from step i) minus (total from step ii)
 - iv. the prevalence of breastfeeding for 1 completed month of age is: (the number still breastfeeding at this age divided by the total number of children aged 1 month or older at the time of the survey) x 100.
 - b. Repeat this for ages 2 to 12 months of age to estimate the prevalence of breastfeeding at each of these ages.

Data heaping may occur if mothers round their recalled reports of duration of breastfeeding. If this has occurred, use a method for data smoothing such as calculating a 3 month moving average, estimating a line of best fit or trendline to adjust the prevalence rates to obtain a more accurate prevalence rate at each month of age (Mackerras, personal communication, WHO 1991b).

Report the percent “ever breastfed” and the prevalence rates at each completed month of age as part of the indicator, as well as the method of smoothing, if applicable.

Measurement issues

All infants and children in the reference age group, regardless of whether they are still breastfeeding at the time of the survey, are included in the calculation of each of the point prevalence rates (<1-12 months) for this indicator eg infants in their sixth month of age at the time of the survey contribute to the point prevalence rates at <1, 1, 2, 3, 4, and 5 months. Infants who are younger at the time of the survey than the age cut offs for each of the point prevalence rates are excluded from the calculations for those months.

Note that survey participants will not be asked directly whether the infant was still breastfeeding at each month of age under 12 months; rather, the indicator will be calculated using data collected from questions about total time breastfed or age at which breastfeeding stopped.

Data requirements

The age in completed months at which breastfeeding stopped for each child (no longer received any breastmilk).

The number of infants/children less than age 4 years at the time of the survey who were breastfed at the age 1,2,3,4,5, 6, 7, 8, 9, 10, 11 and 12 completed months of age.

The number of survey infants/children who reached each completed month of age to 12 months

Age of all survey infants/children in completed months, preferably calculated from birth date.

Data sources

Cross sectional surveys of representative samples of infants and children within the reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

The 1995 NHS and 1994 NATSIS collected information that would allow the calculation of prevalence rates of breastfeeding at each month of age to 12 months, although the recall period of up to 12 years for NATSIS raises doubts about the accuracy of the data for this indicator. Published rates are available from both sources for particular age ranges defined in weeks, only some of which coincide with months of age specified in this indicator.

3. Median duration of breastfeeding among 'ever breastfed' children

Purpose

This is useful for monitoring the effects of interventions specifically aimed at extending duration, rather than those to increase initiation AND duration of breastfeeding.

Indicator

The age in completed months, when 50% of children aged less than 4 years (48 months) who were *ever breastfed*, no longer received any breastmilk.

Calculation

- Exclude those never breastfed from the calculation
- Infants and children who are still breastfeeding at the time of the survey are included in the calculation of the age-specific prevalence rates to avoid the bias that would occur by exclusion of this group. The calculations use a survival analysis approach such as Kaplan-Meier to estimate the percent breastfeeding at each month of age to include both those currently breastfeeding and those that have ceased, and to increase the sample size for age specific estimates by taking account of the overall breastfeeding history for each child (Mackerras, personal communication). For this, it is assumed that someone who stopped breastfeeding at a particular age was breastfeeding for all months up until the age of cessation (eg a child who stopped breastfeeding at 4 months is assumed to have been breastfed at ages 1, 2, and 3 months).
- Include all children meeting the age criterion (<48 months) for whom data on breastfeeding practices are available and arrange by age (in completed months) at the time of the survey. For each age count the total number, number ever-breastfed, and number still breastfeeding at each age;
 - a. commencing with calculation for age = 1 month:
 - i. count the total number of children aged 1 month or older at the time of the survey who were ever breastfed
 - ii. count the number who had stopped breastfeeding by 1 completed month (those that had stopped breastfeeding by 1 completed month, but excluding those who were never breastfed)
 - iii. calculate the number who were still breastfeeding at 1 month = (total from step I) – (total from step ii)
 - iv. the prevalence of breastfeeding among 'ever breastfed' children at 1 month of age is: (the number still breastfeeding at 1 month divided by the total number of children aged 1 month or older at the time of the survey) x 100.
 - b. Repeat this for ages 2 to 12 months of age to estimate the prevalence of breastfeeding among 'ever breastfed' children at each of these ages.

- The **median duration of breastfeeding among ‘ever breastfed’ children** is the month of age at which exactly 50% of the ‘ever breastfed’ children are no longer receiving breastmilk (ie 50% of i. above).
- Report the percent of ‘ever breastfed’ children still breastfeeding at each completed month of age as part of the indicator.

Data heaping may occur if mothers round their recalled reports of duration of breastfeeding. If this has occurred, use a method for data smoothing such as calculating a 3 month moving average, estimating a line of best fit, or trendline to adjust the prevalence rates to obtain a more accurate prevalence rate at each month of age (Mackerras, personal communication, WHO 1991b). Report the method of smoothing, if applicable.

Measurement issues

Children who are still breastfeeding at the time of the survey should be included in the calculation to avoid introducing selection bias.

Smoothing of rates at each month of age is likely to improve the accuracy of the median, and monthly percentages.

Data requirements

The number of infants/children less than age 4 years who were *ever breastfed*.

The number of completed months that each ‘ever breastfed’ infant/child less than 4 years was breastfed.

Current age of all survey infants/children in completed months, preferably calculated from birth date.

Data sources

Cross sectional surveys of representative samples of infants and children within the sample reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

There are no previous national data sources that meet the exact definition of this indicator in Australia, and information about median duration has not been calculated or reported. However, the 1995 NHS and the 1994 NATSIS included questions which sought information relevant to the calculation of this indicator, though the information is not complete for calculation of the indicator as described. Data from NATSIS may not be accurate, as the recall period for duration of breastfeeding was up to 12 years.

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

This indicator gives an overall measure of the degree to which women have adopted breastfeeding behaviour consistent with the current Australian policies with regard to breastfeeding ‘intensity’ or ‘exclusivity’ for the current and proposed recommended duration.

Previous policies of WHO recommended “exclusive breastfeeding for the first 4-6 months”, and the change to “about six months” by WHO has only been very recent. The Australian policy, currently under review is expected to change for a recommendation of 6 months also. Thus, monitoring exclusive breastfeeding rates to six months provides an opportunity to gauge the success in disseminating the new policy recommendation, and to identify age(s) at which greatest declines in exclusive breastfeeding occur

Indicator

Proportion/percent of infants at each completed month of age to 6 months who were *exclusively breastfeeding* in the previous 24 hours.

Calculation: The exclusive breastfeeding rate is calculated as:

(the number of infants aged 1 month, [2 months, 3 months, 4 months, 5 months, 6 months] who were *exclusively breastfeeding* during the previous 24 hours divided by the total number of infants in the relevant age group [ie at each month of age to 6 months]) X 100.

Measurement issues

Published evidence suggests that mothers can recall relatively accurately, even over a long period of time, whether they ever breastfed, and the duration of breastfeeding, but recall is not as accurate for the timing of introduction of other fluids and solid foods. This implies that the rates of exclusive, predominant or full breastfeeding are best measured from an assessment of current practice. WHO and other countries recommend the use of the previous 24 hours as the most accurate and readily measured time period reflecting “current practice”.

Questions must probe for sufficiently accurate and detailed information about fluids/solids to distinguish between exclusive v predominant breastfeeding including water, juice, milk, formula, and other liquids.

WHO recommends use of a standard survey question. Survey questions for use in reporting Australian indicators require further development and testing before a standardised set of questions can be recommended.

Breastfeeding practices in early infancy may vary, with periods of exclusive breastfeeding interspersed with predominant, and partial breastfeeding. Thus, measurement of practices in the previous 24 hours, while minimising measurement error due to recall, may misclassify some individuals. A survey question to determine whether yesterday’s practice was the usual practice since birth should help to identify those with variable feeding practices.

Note that the sample size from most population-based health surveys of infants less than age 6 months will be small. This limits power to detect differences in exclusive breastfeeding rates between population sub-groups and over time. The use of purpose-designed surveys with the potential to include larger samples of infants than that 'captured' in the ABS household surveys has been recommended (see Data Sources section).

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey.

Current age (at the time of the survey) of infants in completed months (preferably calculated from birth date).

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as exclusively or predominantly breastfed

Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids, and asked about solid foods

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys such as the ABS NHS, and State/Territory CATI surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition. The latter would allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based. Information about practices of giving water, juice, or other liquids has not previously been collected in national and state surveys so that rates of exclusive breastfeeding as defined in this indicator cannot be calculated.

5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

Although it is recommended that young infants be exclusively breastfed for the first 4-6 months, scientific evidence suggests that the health benefits of predominant breastfeeding approach those of exclusive breastfeeding, and that predominant breastfeeding is preferable to only partial breastfeeding. Full breastfeeding encompasses both infants who are exclusively breastfed, and those who are predominantly breastfed. In other words, those whose main source of nourishment is breastmilk. Thus, the indicator, percent fully breastfeeding at each month of age to 6 months enables assessment of the extent to which mothers are approximating current policy recommendations in Australia regarding breastfeeding intensity, and the age(s) at which greatest declines in full breastfeeding occur. The rate of predominant breastfeeding can be derived by subtracting indicator 4 (exclusive breastfeeding) from this indicator (full breastfeeding).

Indicator

Proportion/percent of infants at each completed month of age to six months who were fully *breastfed* in the previous 24 hours.

Calculation: The fully *breastfeeding* rate is calculated as:

(the number of infants aged <1 month [1 month, 2 months, 3 months, 4 months, 5 months and 6 months] who were *fully breastfed* during the previous 24 hours divided by the total number of infants in the relevant age group[ie at each month of age to 6 months] X 100.

Measurement issues

Measurement issues are similar to those for the indicator for exclusive breastfeeding, eg obtaining sufficient information about consumption of all types of fluids and solids to be able to distinguish between exclusive, predominant and partial breastfeeding; inaccuracy of recalled information, and small sample sizes when basing the estimate on current practices of infants less than age 6 months at the time of the survey.

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey.

Current age (at the time of the survey) of infants (preferably calculated from birth date).

For each infant in the reference age range, 24 hour recall data of all liquids and solids consumed, as the basis for classifying infants as exclusively or predominantly breastfeeding Fully breastfeeding includes both of these groups.

Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

A fully breastfeeding rate comparable with the proposed rate among infants less than 6 months, cannot be calculated from previous national surveys because information has not been collected: a) about practices of giving water, juice, or other liquids, and b) about current feeding practices (in the previous 24 hours).

6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

This indicator gives a minimum measure of the degree to which women are introducing solid foods earlier than the policy recommendations of 4-6 months. It does not contain information about whether the types of foods or the quantities given are appropriate to meet nutritional needs.

Indicator

Percentage of infants aged 6 months or less who have received *solid foods* in the previous 24 hours.

The indicator is calculated as:

(the number of infants aged <1 month [1 month, 2 months, 3 months, 4 months, 5 months, and 6 months] who have received *solid or semi solid foods* in the past 24 hours divided by the total number of infants in the relevant age group, [ie At each completed month of age to 6 months]) X 100.

Measurement issues

Are those discussed above for exclusive and full breastfeeding rates.

In addition, a definition of solid and semi-solid food is required to prompt accurate responses to the 24 hour recall of feeding practices.

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey.

Current age (at the time of the survey) of infants in completed months, (preferably calculated from birthdate).

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as consuming or not consuming solid or semi solid foods

Respondents should be probed about the different kinds of liquids the infant may have received including water, juice, milk, formula, and other liquids, and asked about solid foods.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

No information is available from previous Australian national surveys to report on this indicator based on current practice. Information was collected in the 1995 and 2001 National Health Surveys about the age mothers recalled first giving breastmilk substitutes and/or solid foods to their infants regularly. This information could be calculated and reported as percentages receiving solid foods at each month of age to 6 months although it would not be directly comparable with the proposed indicator, based on current practice.

7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

Young infants may not be exclusively or predominantly breastfed because they receive either breastmilk substitutes or solid foods. This indicator gives a picture of the extent and timing of use of breastmilk substitutes, as distinct from solid foods, among young infants.

Indicator

Percentage of infants at each completed month of age to 6 months who have received breastmilk substitutes in the previous 24 hours.

The indicator is calculated as:

(the number of infants at each month of age <1 month [1 month, 2 months, 3 months, 4 months, 5 months and 6 months] to 6 months who have received breastmilk substitutes in the past 24 hours divided by the total number of infants in the relevant age group [ie at each completed month of age to 6 months]) X 100.

Measurement issues

Are similar to those outlined for exclusive and full breastfeeding and solid foods indicators

Data about feeding breastmilk substitutes in the past 24 hours can be collected by a question similar to that of the WHO standard question to identify exclusive and predominant breastfeeding (appendix 4).

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as consuming or not consuming breastmilk substitutes

Respondents should be probed about the different kinds of liquids the infant may have received including water, juice, milk, formula, and other liquids, and asked about solid foods. Current age of infants (at the time of the survey) in completed months, calculated from birthdate.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

No information is available from previous Australian national surveys to report on this indicator based on current practice. Information was collected in the 1995 and 2001 National Health Surveys about the age mothers recalled first giving breastmilk substitutes and/or solid foods to their infants regularly. This information could be reported as percentages receiving breastmilk substitutes at each completed month of age to 6 months, although it would not be comparable with the proposed indicator, based on current practice.

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Appendix 1: WHO international policies

Date	Name of policy	Aims	Recommended breastfeeding practices
2001	Global strategy for infant and young child feeding ¹	To help fulfil the right of every child to the highest attainable standard of health by protecting, promoting and supporting optimal feeding practices.	<p>There is consensus on the need for exclusive breastfeeding and ways to achieve it, for example by improving the pre-service and in-service training of health professionals; by supporting the Baby-friendly Hospital Initiative; and by ensuring that mothers have access to accurate information and skilled help to foster optimal infant-feeding practices, and to overcome difficulties when they occur.</p> <p>Timely, safe and adequate complementary feeding, with continued breastfeeding, needs to be made a high priority of global nutrition.</p> <p>Where industrially processed complementary foods are concerned, as the Health Assembly noted in 1984, inappropriate marketing practices contribute to faulty feeding practices through the promotion of infant foods for use at too early an age and through the promotion of products (eg sweetened condensed milk) that are unsuitable for infant feeding.</p> <p>The joint UNICEF/UNAIDS/WHO guidelines on HIV and infant feeding issued in 1998 remain valid. All HIV-infected mothers should receive counselling that includes information about the risks and benefits of different feeding options, and specific guidance in selecting the option most likely to be suitable for their situation.</p> <p>There is a need to define operational responsibilities, and to determine ways in which to mobilise resources, for a range of concerned parties such as governments, international organisations, health professional bodies and civil society.</p>
2001	The Optimal Duration of Exclusive Breastfeeding: Results of a WHO systematic review. Note for the Press No 7. ²	To determine the optimal duration of exclusive breastfeeding.	<p>Exclusive breastfeeding for six months (confers several benefits on the infant and the mother). This recommendation applies to populations.</p> <p>Complementary foods that are nutritionally adequate, safe and appropriate are needed in conjunction with continued breastfeeding from six months of age.</p>
1995	The World Health Organization's infant-feeding recommendation ³	To record WHO's current infant-feeding recommendations To enable mothers to make an informed choice about how to feed their newborns.	After the initial period of exclusive breastfeeding, children should continue to be breastfed for up to two years of age or beyond while receiving nutritionally adequate and safe complementary foods.
1991	The Baby-Friendly Hospital Initiative ⁴	To support early initiation of breastfeeding. To promote exclusive breastfeeding for the first six months.	<p>Every facility providing maternity services and care for newborn infants should follow the Ten Steps to Successful Breastfeeding.</p> <ol style="list-style-type: none"> 1. Have a written breastfeeding policy that is routinely communicated to all health care staff. 2. Train all health care staff in skills necessary to implement this policy. 3. Inform all pregnant women about the benefits and management of breastfeeding.

Date	Name of policy	Aims	Recommended breastfeeding practices
		<p>To ensure the cessation of free and low cost infant formula supply to hospitals. To include, possibly at a later stage and where needed, other mother and infant health care issues.</p>	<p>4.Help mothers initiate breastfeeding within half-hour of birth.</p> <p>5.Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.</p> <p>6.Give newborn infants no food and drink other than breastmilk, unless medically indicated.</p> <p>7.Practise rooming-in – allow mothers and infants to remain together 24 hours a day.</p> <p>8.Encourage breastfeeding on demand.</p> <p>9.Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.</p> <p>10.Foster the establishment of breastfeeding support groups and refer mother to them on discharge from the hospital or clinic.</p>
1990	Innocenti Declaration on the protection, promotion and support of breastfeeding ⁵	To protect, promote and support breastfeeding.	<p>The declaration set a number of operational targets whereby all governments, by 1995, should have:</p> <ul style="list-style-type: none"> • Appointed a national breastfeeding coordinator and a multisectoral national breastfeeding committee. • Ensured that every facility providing maternity services fully practices all Ten Steps to Successful Breastfeeding. • Taken action to give effect to the principles and aim of the International Code of Marketing of Breastmilk Substitutes. • Enacted imaginative legislation protecting the breastfeeding rights of working women.
1981	International Code of Marketing of Breast-milk Substitutes ⁶	<p>To contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breastfeeding, and by ensuring the proper use of breastmilk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution.</p>	<p>No advertising of all these products (breastmilk substitutes, including infant formula, other milk products, foods and beverages, including bottle-fed complementary foods, when marketed or otherwise represented to be suitable, with or without modification, for use as a partial or total replacement of breastmilk, feeding bottles and teats) to the public.</p> <p>No free samples to mothers.</p> <p>No promotion of products in health care facilities.</p> <p>No company mothercraft nurses to advise mothers.</p>

Date	Name of policy	Aims	Recommended breastfeeding practices
			<p>No gifts or personal samples to health workers.</p> <p>No words or pictures idealising artificial feeding, including pictures of infants, on the labels of the products.</p> <p>Information given to health workers should be scientific and factual.</p> <p>All information on artificial infant feeding, including the labels, should explain the benefits of breastfeeding, and the costs and hazards associated with artificial feeding.</p> <p>Unsuitable products, such as sweetened condensed milk, should not be promoted for babies.</p> <p>All products should be of a high quality and take account of the climatic and storage conditions of the country where they are used.</p>

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4. WHO 199, The Baby-Friendly Hospital Initiative, <http://www.who.dk/WHO-Euro/about/babies.htm>.
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Appendix 2: International literature review documents

Reference	Name of review	Purpose of review	Methods used/type of review	Key findings that relate to breastfeeding
WHO, 2 April 2001	The Optimal Duration of Exclusive Breastfeeding: Results of a WHO systematic review. Note for the Press No 7.	To determine the optimal duration of exclusive breastfeeding	<p>Systematic review</p> <p>More than 3000 references were identified for independent review and evaluation</p> <p>Outcome of this process was subjected to a global peer review</p> <p>Findings were submitted for technical scrutiny during an expert consultant.</p>	<p>The evidence does not suggest an adverse effect of exclusive breastfeeding for six months on infant growth on an overall population basis, ie on average.</p> <p>The evidence from one trial in Honduras demonstrates poorer iron status in infants exclusively breastfed for six months, versus four months followed by partial breastfeeding to six months. This evidence is likely to apply to populations in which maternal iron status and infant endogenous stores are not optimal.</p> <p>The available data suggest exclusive breastfeeding for six months has protective effects against gastrointestinal infection (data derived from a study in Belarus where hygienically prepared complementary foods were used.)</p> <p>The evidence does not demonstrate a protective effect against respiratory tract infection (including otitis media) or atopic disease, in infants exclusively breastfed for six months compared to infants exclusively breastfed for four–six months.</p> <p>The results of two controlled trials in Honduras indicate that exclusive breastfeeding for six months (versus four months) confers an advantage in prolonging the duration of lactational amenorrhoea in mothers who breastfeed frequently (mean 10–14 feedings/day).</p> <p>The same Honduran trials demonstrated higher postpartum weight loss in mothers who exclusively breastfed for six months compared with mothers who exclusively breastfed for four months.</p>

Reference	Name of review	Purpose of review	Methods used/type of review	Key findings that relate to breastfeeding
Brown, Dewey & Allen, 1998 ²	Complementary feeding of young children in developing countries: A review of current scientific knowledge.	<p>To provide the background information necessary for development of scientifically sound feeding recommendations.</p> <p>To primarily focus on the particular needs of children in developing countries.</p>	<p>Strategy used to locate references not stated</p> <p>Critical review</p>	<p>Frequent, exclusive breastfeeding is critical for stimulating optimal milk production, especially during the first few weeks of life.</p> <p>Exclusive breastfeeding in early life protects against infections and reduces mortality, particularly in developing countries where microbial contamination of foods and fluids is common.</p> <p>Because infant demand is the primary determinant of maternal milk production, avoidance of other foods and fluids is essential to optimise breastmilk intake in the early months. The degree to which other foods or fluids displace breastmilk varies with the age of the infant.</p> <p>Use of non-breastmilk foods and fluids may interfere with the bioavailability of certain key nutrients in breastmilk, such as iron and zinc.</p> <p>In affluent populations, growth rates of infants who are exclusively breastfed during the first six months or more are similar to those of infants given solid foods between four and six months.</p> <p>In disadvantaged populations, none of the observational studies reviewed showed a growth advantage of complementary feeding of breastfed infants prior to six months.</p> <p>Based on two observational studies, the risk of diarrhoeal morbidity in poor populations is two-fold to 13-fold higher when breastfed infants are given complementary foods between four and six months than when they are exclusively breastfed.</p> <p>Based on one experimental study (the only one completed at the time of the review), no growth difference was found from four to six months of age between exclusively breastfed infants and those given hygienically prepared nutritionally adequate foods in addition to breastmilk.</p> <p>The evidence as a whole is sufficient to support a recommendation that full-term infants with appropriate weight-for-gestational-age should be exclusively breastfed until about six months of age.</p> <p>Low-birth-weight infants are at greatest risk of iron deficiency. Breastmilk continues to make an important nutritional contribution well beyond the first year of life.</p>

Reference	Name of review	Purpose of review	Methods used/type of review	Key findings that relate to breastfeeding
World Health Organization, 1998 ³	Evidence for the Ten Steps to Successful Breastfeeding	To review the evidence for the efficacy of the 'Ten Steps' To provide a tool for both advocacy and education	Systematic review Literature search outlined Studies were included/excluded according to pre-established criteria Only randomised controlled studies and allocation was systematic or when a 'before and after intervention design' was used	<p>In affluent populations, long-term (past 12 months) breastfeeding is more common among women who are well educated and can afford good quality complementary foods. Thus, there is little risk of nutrient deficiencies unless the parents are overly restrictive about the types of foods given or the child is very dependent on the breast.</p> <p>The evidence from affluent countries suggests that there is no negative impact on linear growth of continued breastfeeding beyond 12 months.</p> <p>In developing countries, there is considerable evidence to suggest that long-term breastfeeding up to two years or beyond can be beneficial by providing a source of key nutrients, increasing birth spacing and protecting against both the incidence of infections and their adverse nutritional impact.</p> <p>Substantial evidence exists for most of the 'Ten Steps', even when considered separately and despite the inherent difficulties of randomisation.</p>

Reference	Name of review	Purpose of review	Methods used/type of review	Key findings that relate to breastfeeding
Lutter C, 1992 ⁴	Recommended length of exclusive breast-feeding, age of introduction of complementary foods and the weaning dilemma	To assess the risks and benefits of introducing complementary foods between four and six months of age to exclusively breastfed infants living in poverty To assess energy requirements and the length of time they can be satisfied by exclusive breastfeeding	Strategy used to locate references not stated Critical review	The introduction of complementary foods to exclusively breastfed infants increases the risk of diarrhoea. Exclusively breastfed infants have a pattern of growth that is different from that of formula-fed infants. The current recommendations for energy intake exceed the mean energy intake of exclusively breastfed infants by about 15-20%. The existence of growth faltering in the first six months of life among breastfed infants living in poverty has not been established. A comparison of the growth patterns during the first six months of life of breastfed infants who were given complements (or supplements) and those of exclusively breastfed infants did not establish either the superiority or inferiority of exclusive breastfeeding over breastfeeding with complementary feeding. The overall negative effect of diarrhoea on growth during the four-six month period has not been established. Although many position papers exist, the scientific basis for the current recommendation of four-six months for the length of exclusive breastfeeding is not adequately documented. The distribution of the target population for the recommended period of exclusive breastfeeding is not defined. The target population for the recommendation for the age of introduction of complementary foods is not well defined.

Sources:

- 1 WHO 2001, *The Optimal Duration of Exclusive Breastfeeding: Results of a WHO systematic review*, Note for the Press No 7, 2 April 2001, <http://www.who.int/inf-pr-2001/en/note2001-07.html>.
- 2 Brown KH, Dewey KG, Allen LH 1998, *Complementary feeding of young children in developing countries: A review of current scientific knowledge*, WHO, Geneva, Switzerland.
- 3 WHO 1998, *Evidence for the Ten Steps to Successful Breastfeeding*, Division of Child Health and Development, WHO, Geneva, Switzerland, WHO/CHD/98.9.
- 4 Lutter C 1992, *Recommended length of exclusive breast-feeding, age of introduction of complementary foods and the weaning dilemma*, WHO, Geneva, Switzerland, WHO/CDD/EDP/92.5.

Appendix 3: State and territory government nutrition strategies: breastfeeding promotion goals, objectives

State/Territory	Breastfeeding goals	Specific recommended breastfeeding practices/definitions identified	Proposed aspects for monitoring
Australian Capital Territory ¹	No policy		
New South Wales (draft in preparation)	"To increase the initiation and duration of breastfeeding in NSW"	Practices and definition of terms not specified	Align breastfeeding indicators with national recommendations
Northern Territory ² (1994)	Five goals....among them... "to enable women to breastfeed from birth to at least 6 months... "increase the overall duration of breastfeeding"	Practices and definitions of terms not specified	breastfeeding rate at hospital discharge breastfeeding rate at 3 months breastfeeding rate at 6 months
Queensland (draft in preparation)	"Increased proportion of infants that are breastfed (either exclusively or partially) to at least 6 months"	Exclusive breastfeeding is recommended as the optimal source of nutrition for infants during the first four to six months of life' Definition of terms not specified	Report on... "Full and partial breastfeeding at discharge, 3 months and 6 months"
South Australia ³ (1999)	"Endeavour to increase the proportion of babies aged six months who are fully or partially breastfed by 10% by 30 June 2000"	Recommends 'full' or 'partial' breastfeeding for the first six months Definition of terms not specified Recommends a total breastfeeding duration of at least three months Definition of terms not specified Mothers practices not specified or defined- policy relates to hospital and health facility practices.	No indicators specified though objective implies measurement of full and partial breastfeeding at 6 months No indicators specified for breastfeeding (recommends development of monitoring system for nutrition) Evaluation of policies recommended...
Tasmania ⁴ (1994)	"Breastfeeding be encouraged as the preferred method of infant feeding (especially in the first three months)"		Breastfeeding rates in hospital, at 2 weeks, at 3 months, and 6 months
Victoria ⁵ (1998)	"Hospitals should be encouraged to adopt a policy on breastfeeding" that ... "contributes to improved duration of breastfeeding"		

State/Territory	Breastfeeding goals	Specific recommended breastfeeding practices/definitions identified	Proposed aspects for monitoring
Western Australia ⁶ (1998)	<p>'To encourage and support breastfeeding in Western Australia'</p> <p>" to increase the percentage of babies who are breastfed."</p>	<p>Defines 'fully breastfed' - "infants who have been exclusively or almost exclusively breastfed"</p> <p>this definition is consistent with the WHO and Labbok and Krasovec Schema/ differs from WHO slightly</p>	<p>fully breastfed rate at hospital discharge </p> <p>fully breastfed rate at 3 months</p> <p>fully breastfed rate at 6 months</p>

Sources:

1. Person communication, Lyn Brown, Director, Nutrition Services, Canberra Hospital.
2. NT Dept Health and Community Services, **Breastfeeding policy and Strategic Plan 1994-2000**, Northern Territory Government.
3. South Australian Dept Health 1999, *South Australian Food and Health Policy 1999*.
4. Tasmanian Dept Health 1994, *Food and Nutrition Plan for Tasmania*.
5. Public Health Division, Victorian Dept Human Services 1998, *Promoting Breastfeeding - Victorian Breastfeeding Guidelines*.
6. Health Dept WA 1998, *Public Health Action in Breastfeeding 1998-2003*.

Appendix 4: Breastfeeding questions from WHO and recent Australian national surveys

WHO sample questions for use in surveys on breastfeeding indicators¹

For each child less than 24 months old ask the respondent

1. Can you tell me how old the child is today?

If possible, the exact date of birth is.....

2. Since this time yesterday, has (name) been breastfed? 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 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

¹ Source: WHO 1991

Breastfeeding questions from the 1989–90 NHS

As part of the Women's Health Questionnaire in the 1989–90 survey, breastfeeding questions were asked of mothers aged 18–50 years who were currently breastfeeding or had breastfed a child (or children) aged five years or under at the time of the survey.

Q13. Do you have children aged 5 years or less?

Yes – go to question 14

No – no more questions

Q14. Are you breastfeeding or have you breastfed your child or children who are currently aged 5 years or less?

Yes – go to question 15

No – no more questions

Q15. Please write down the ages of each child aged 5 years or less.

Age collected in years and months (child 1 to 5)

Q16. Please write down the number of months you breastfed or have been breastfeeding your child or children listed in the previous question.

Duration collected in months (child 1 to 5)

Breastfeeding questions from the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS)

As part of the NATSIS, breastfeeding questions were asked for each child aged 12 years or less.

Q39. Was breastfed?

Yes, was breastfed

Yes, currently breastfeeding

No

Don't know

Q39a. If yes, was breastfed – How long was breastfed for?

Less than 1 month

Or

Number of months

Or

Number of years

Breastfeeding questions from the 1995 NHS

There were 14 breastfeeding questions included in the 1995 NHS. Information was collected for all children aged <4 years (n=3,252), at the time of the survey. For most children, questions were answered on their behalf by a parent, usually the mother (approximately 80%). The aim of the module on breastfeeding was to assess the length of time an infant was breastfed and when substances other than breastmilk were introduced. 'Introduced' was defined as when first started taking food or breastmilk substitutes on a regular basis, not when first offered or one-off occasions when the food was taken (ABS 1998).

Q301. Hasever been breastfed?

Yes

No → Q304

Q302. Is currently being breastfed?

Yes

No

Q303. Wasbreastfed whenfirst came home from hospital?

Yes

No

No hospital

Q304. Hasever been given infant formula regularly?

Yes

No → Q306

Q305. At what age was first given infant formula regularly?

Weeks

Months

Less than one week

Don't know

Q306. Hasever been given cows milk regularly?

Yes

No → Q308

Q307. At what age wasfirst given cow's milk regularly?

Weeks

Months

Less than one week

Don't know

Q308. Apart from breastmilk/infant formula/cow's milk has ever been given any (other) type of milk substitute on a regular basis?

Yes

No → Q311

Q309. What type of milk substitutes did have?

Soya bean milk

Goat's milk

Evaporated milk

Other

Q310. At what age was first given (this/any of these) milk substitute(s) milk regularly?

Weeks

Months

Less than one week

Don't know

Q311. Sequence guide

If aged less than 6 months → Q312

Otherwise → Q313

Q312. Has ever been given solid food?

Yes

No —> Q314

Q313. At what age was first given solid food regularly?

Weeks

Months

Never/not

Don't know

Q314. Sequence guide

If code '2' (No) in Q302 —> Q315

Otherwise —> No further questions about breastfeeding

Q315. Including times of weaning, what is the total time was breastfed?

Weeks

Months

Less than one week

Don't know

Q316. What is the main reason you stopped breastfeeding?

Teething

Child bored

Felt it was time to stop

Resumed work

Pregnant

Not producing any/adequate milk

Other

Breastfeeding questions to be included in the 2001 NHS

Q150. Sequence guide

If child aged 0–3 years → Q151

Otherwise → do not ask breastfeeding questions

Q151. Hasever been breastfed?

Yes

No → Q154

Don't know → Q154

Q152. Is currently being breastfed?

Yes

No

Don't know

Q153. Wasbreastfed when (he/she) first came home from hospital?

Yes

No

No hospital

Q154. Hasever been given infant formula regularly?

Yes

No → Q156

Don't know → Q156

Q155. At what age wasfirst given infant formula regularly?

Weeks

Months

Less than one week

Don't know

Q156. Has ever been given cows milk regularly?

Yes

No → Q158

Don't know → Q158

Q157. At what age was first given cow's milk regularly?

Weeks

Months

Less than one week

Don't know

Q158. (Apart from breastmilk/infant formula/cow's milk)

Has ever been given any (other) type of milk substitute on a regular basis?

Yes

No → Q161

Don't know → Q161

Q159. What type of milk substitutes did have?

Soya bean milk/soy milk

Goat's milk

Evaporated milk

Other

Q160. At what age was first given (this/any of these) milk substitute(s) regularly?

Weeks

Months

Less than one week

Don't know

Q161. Sequence guide

If aged less than 6 months → Q162

Otherwise → Q163

Q162. Has ever been given solid food?

Yes

No → Q164

Q163. At what age was first given solid food regularly?

Weeks

Months

Less than 1 week

Don't know

Q164. Sequence guide

If breastfed but not currently (code '2') in Q152 → Q165

Otherwise → No further questions about breastfeeding

Q165. Including times of weaning, what is the total time was breastfed?

Weeks

Months

Less than one week

Don't know

Q166. What is the main reason (you/.....mother) stopped breastfeeding?

Teething

Child bored

Felt it was time to stop

Resumed work

Pregnant

Not producing any/adequate milk

Other problems with breastfeeding eg cracked nipples

Other

Appendix 5: Information about breastfeeding from the 1995 National Health Survey

The following summary was taken from the document *Key Food and Nutrition Data for Australia 1990-1999*, (Marks GC, Rutishauser IHE, Webb K & Picton P 2001 unpublished).

Breastfeeding is widely recognised as the optimal method of feeding during early infancy, conferring a wide variety of health benefits to infants (NHMRC 1995). Breast milk contains factors that are crucial to development of the immune system of the infant and which help protect against many bacteria and viruses. Nutritionally, human milk is particularly suited to the growth and requirements of the infant. Evidence is accumulating that in both developed and less developed countries, breastfeeding protects against a number of acute and possibly chronic diseases in childhood, and into adulthood. Greater health benefits are seen when breastfeeding is exclusive or predominant, indicating that 'more breastfeeding is better' in early infancy (WHO 2001).

Key breastfeeding practices recommended in the current *Dietary guidelines for children and adolescents* (NHMRC 1995) and the *Infant feeding guidelines* (NHMRC 1996) include exclusive breastfeeding for the first four to six months of life; breastfeeding complemented with appropriate foods from four to six months, and continued breastfeeding up to at least 12 months of age while receiving appropriate complementary foods. It is anticipated that the World Health Organization will update these recommendations in the near future, in accordance with a change in infant feeding policy. This now promotes exclusive breastfeeding for the first six months, followed by breastfeeding complemented with appropriate foods from six months.

National goals and targets for breastfeeding relating to increasing the proportions of mothers who were fully and partially breastfeeding to at least six months were proposed in 1991 (Nutbeam et al 1993).

The 1995 NHS showed that while most mothers were breastfeeding initially, this high level was not maintained (Donath and Amir 2000).

Table A5.1 Proportion of children still breastfed at specific ages, and proportion fully breastfed by age; 1995 NHS

	Time	Proportion
Duration of any breastfeeding	Hospital discharge	82%
	3 months	63%
	6 months	46%
	12 months	21%
Full breastfeeding:	3 months	57%
	6 months	19%

Donath and Amir 2000

Among those who were breastfeeding, most were fully breastfeeding in the early weeks and months. However, after three months, a substantial proportion of mothers introduced other fluids and solids so that by six months, only 19% of mothers were fully breastfeeding.

A strong relationship between socio-economic status (SES) and breastfeeding was observed in the 1995 NHS. There was a difference of nearly 20% in the prevalence of any breastfeeding at six months between the lowest and highest SES groups as defined by SEIFA quintiles (37% vs 53% breastfeeding respectively) (Donath and Amir 2000).

Information about trends in breastfeeding are not currently available because the data collected in the 1989-90 and the 1995 National Health Surveys were not comparable. It is expected that information will be available in the near future comparing breastfeeding rates from the 1995 and 2001 National Health Surveys.

Appendix 6: Example calculations for Australian breastfeeding indicators

Refer to Chapter 6 for a description of the data requirements and methods of calculating breastfeeding indicators.

Table A6.1 shows the data required for calculating the indicators based on a hypothetical dataset of about the same size as that available from the 1995 NHS. The steps for calculation of the indicators are illustrated in the sections that follow.

Indicator 1. Percent ever breastfed

The number of infants/children *ever breastfed* is given by the total of column c in table A6.1(b); the total number of infants/children in the reference age range (ie <4 years or <48 completed months) is given by the total in column b.

$$\text{Percent ever breastfed} = \frac{2,880}{3,360} \times 100 = 85.7\%$$

Table A6.1(a): Hypothetical dataset, with data needed to calculate indicators 4 - 7

Column: a Current age in completed months	b Total number in sample	c Number exclusively breastfed in last 24 hrs	d Number predominant breastfed* in last 24 hrs	e Number received solids in last 24 hrs	f Number received a breastmilk substitute in in last 24 hrs
<1	70	40	20	0	10
1	70	30	20	5	15
2	70	20	25	15	20
3	70	15	25	25	30
4	70	10	20	40	40
5	70	5	10	55	50
6	70	0	5	65	60
7-47	2,870				
Total					
0-47	3,360				

*The rate for fully breastfed is calculated from the sum of the number predominantly breastfed and the number exclusively breastfed.

Table A6.1(b): Hypothetical dataset, with data needed to calculate indicators 1 to 3

Column: a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t
Current age in completed months	Total number in sample	Number ever breastfed	Never breastfed	Age of Cessation of Breastfeeding (in Days*)															
				<30	30- <61	61- <91	91- <122	122- <152	152- <183	183- <213	213- <244	244- <274	274- <305	305- <335	335- <366	366- <396	396- <427	427- <457	457- <488
<1	70	60	10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	70	60	10	4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	70	60	10	4	3	3	-	-	-	-	-	-	-	-	-	-	-	-	-
3	70	60	10	5	3	4	4	-	-	-	-	-	-	-	-	-	-	-	-
4	70	60	10	4	3	3	3	3	-	-	-	-	-	-	-	-	-	-	-
5	70	60	10	3	4	3	3	3	3	-	-	-	-	-	-	-	-	-	-
6	70	60	10	5	3	3	3	3	2	2	-	-	-	-	-	-	-	-	-
7	70	60	10	4	3	3	3	3	3	7	7	-	-	-	-	-	-	-	-
8	70	60	10	4	3	3	3	3	3	6	6	6	-	-	-	-	-	-	-
9	70	60	10	4	4	3	3	3	2	6	7	5	5	-	-	-	-	-	-
10	70	60	10	5	3	3	3	3	3	6	6	6	2	2	-	-	-	-	-
11	70	60	10	4	3	3	3	3	3	7	6	6	2	2	2	-	-	-	-
12	70	60	10	4	3	4	3	3	3	6	6	5	2	2	3	3	-	-	-
13	70	60	10	4	3	3	3	3	2	6	6	6	2	2	4	4	4	-	-
14	70	60	10	3	3	3	4	2	3	6	6	6	2	2	4	2	2	2	-
15-47	2,310	1,980	330	120	103	99	98	94	92	204	191	188	65	71	50	151	58	26	0
Total																			
0-47	3,360	2,880	480	178	147	140	133	126	119	256	241	228	80	81	59	162	62	28	0

*The grouping of numbers of days is equivalent to <1 month (col e), 1 completed month (col f), ... 15 completed months.

Indicator 2. Percent breastfeeding at each completed month of age to 12 months

The example given in table A6.2 is derived from the data described in table A.6.1.

Table A6.2 Percent breastfeeding at each completed month of age to 12 months — example without data heaping

Age in completed months	Total number in sample who were ever aged 1m,2m ... to 12mths*	Number who had stopped breastfeeding by specific ages	Number still breastfed at specific ages ***	Percent still breastfed at specific ages
Ever breastfed	3,360	480	2,880	85.7
1	3,290	658	2,632	80.0
2	3,220	805	2,415	75.0
3	3,150	945	2,205	70.0
4	3,080	1,078	2,002	65.0
5	3,010	1,204	1,806	60.0
6	2,940	1,323	1,617	55.0
7	2,870	1,579	1,291	45.0
8	2,800	1,820	980	35.0
9	2,730	2,048	682	25.0
10	2,660	2,128	532	20.0
11	2,590	2,209	381	15.0
12	2,520	2,268	252	10.0

* Calculated by starting with the total from column b of table A6.1(b), and subtracting the total number of children in the sample aged less than the age of interest.

** Calculated by adding the totals for the number who had stopped breastfeeding by that age, from columns d to t in table A6.1(b); includes those who were never breastfed.

*** The difference between the previous two columns.

The example given in the table below uses the same distribution of children across ages as shown above, but has changed the data in the third column to give a pattern of age heaping in the breastfeeding reporting. The initial calculations are done as shown in table A6.2. The results of the second last column are smoothed using a 3-month moving average to adjust the prevalence rates, with the results shown in the last column.

Table A6.3 Percent breastfeeding at each completed month of age to 12 months — example with data heaping in reporting of breastfeeding practices (evidence of data heaping at 3, 6 and 9 months)

Age in completed months	Total number in sample who were ever aged 1m,2m ... to 12mths*	Number who had stopped breastfeeding by specific ages	Number still breastfed at at specific ages ***	Percent still breastfed at specific ages	3 mth moving average for percent breastfed at specific ages*
Ever breastfed	3,360	480	2,880	85.7	85.7
1	3,290	592	2,698	82.0	81.9
2	3,220	708	2,512	78.0	76.7
3	3,150	945	2,205	70.0	72.0
4	3,080	986	2,094	68.0	67.7
5	3,010	1,054	1,956	65.0	62.7
6	2,940	1,323	1,617	55.0	56.0
7	2,870	1,492	1,378	48.0	47.7
8	2,800	1,680	1,120	40.0	37.7
9	2,730	2,048	682	25.0	28.3
10	2,660	2,128	532	20.0	20.0
11	2,590	2,209	381	15.0	15.0
12	2,520	2,268	252	10.0	10.0

*Except for those aged <1 month and 12 months the 3 month moving average is calculated from the calculated percent breastfed for the previous, current and subsequent months ie at 2 months from data for infants at 1, 2 and 3 completed months $(85+82+78)/3 = 81.7$

Indicator 3. Median duration of breastfeeding among ever breastfed children

The example given in table A6.4 is derived from the data described in table A.6.1.

Table A6.4 Median duration of breastfeeding among ever breastfed children (example without data heaping)

Age in completed months	Total number in sample ever breastfed*	Number still breastfed at specific ages	Percent of 'ever breastfed' children still breastfeeding at specific ages
Ever breastfed	2,880	2,880	100.0
1 month	2,820	2,632	93.3
2 months	2,760	2,415	87.5
3 months	2,700	2,205	81.7
4 months	2,640	2,002	75.8
5 months	2,580	1,806	70.0
6 months	2,520	1,617	64.2
7 months	2,460	1,291	52.4
8 months	2,400	980	40.8
9 months	2,340	682	29.1
10 months	2,280	532	23.3
11 months	2,220	381	17.1
12 months	2,160	252	11.7
13 months	2,100	90	4.3
14 months	2,040	28	1.4
15 months	1,980	0	0

* Calculated by starting with the total from column c of table A6.1(b), and subtracting the total number of children "ever breastfed" aged less than the age of interest.

** As per table A6.2

The median duration of breastfeeding is $>6 < 7$ completed months **since 50% of the total number ever breastfed (1,440) were still breastfeeding in this age range.**

The example given in table A6.5 uses the same distribution of children across ages as shown in the table above, but has changed the data in the third column to give a pattern of age heaping in the breastfeeding reporting. The results in the last column are smoothed using a 3 month moving average to adjust the prevalence rates.

Table A6.5 Median duration of breastfeeding among ever breastfed children (example with evidence of data heaping at 3, 6 and 9 months)

Age in completed months	Total number in sample ever breastfed*	Number still breastfed at specific ages	Percent of 'ever breastfed' children still breastfeeding at specific ages
Ever breastfed	2,880	2,880	100.0
1 month	2,820	2,698	95.7
2 months	2,760	2,512	91.0
3 months	2,700	2,205	81.7
4 months	2,640	2,094	79.3
5 months	2,580	1,956	75.8
6 months	2,520	1,617	64.2
7 months	2,460	1,378	56.0
8 months	2,400	1,120	46.7
9 months	2,340	682	29.1
10 months	2,280	532	23.3
11 months	2,220	381	17.1
12 months	2,160	252	11.7
13 months	2,100	90	4.3
14 months	2,040	28	1.4
15 months	1,980	0	0

In this example the median duration of breastfeeding is unaffected by data heaping at 3, 6 and 9 months of age and is still >6<7 completed months since 50% of the total number ever breastfed (1,440) were still breastfeeding in this age range.

Indicators 4-7. Percent exclusively breastfeeding, fully breastfeeding, receiving solid foods and receiving breast milk substitutes in the previous 24 hours, for infants at each completed month of age to 6 months

The example given in table A6.6 is derived from the data described in table A.6.1.

Table A6.6 Percent with specific infant feeding practices at each completed month of age to 6 months

Age in completed months	Number in sample	Percent exclusively breastfed in previous 24 hrs	Percent fully breastfed in previous 24 hrs	Percent received solids in previous 24 hrs	Percent received breastmilk substitutes in previous 24 hrs
<1	70	57.1	85.7	0	14.3
1	70	42.9	71.4	7.1	21.4
2	70	28.6	64.3	21.4	28.6
3	70	21.4	42.9	35.7	42.9
4	70	14.3	35.7	57.1	57.1
5	70	7.1	21.4	78.6	71.4
6	70	0	7.1	92.9	85.7

* Number fully breastfed = number exclusively breastfed plus number predominantly breastfed

Appendix 7: Proposed breastfeeding indicators to meet International reporting obligations

WHO maintains a Global Data Bank on breastfeeding rates around the world, based on recommended standardised indicators and definitions of breastfeeding practices (WHO 1991). Australia has not previously reported its breastfeeding rates to WHO. It is recommended that the following indicators be calculated from data collected to meet the requirements for the Australian indicators outlined in chapter 6, and reported to WHO on a regular basis. Thus, these indicators impose no additional data requirements.

The following indicators align with those recommended by WHO, with two exceptions. The first two Australian indicators are based on recalled practices relating to 0-<4 year olds, rather than current practices relating to 0-2, and 0-3 year olds, as used by WHO. For reasons outlined in the body of this report, recalled practices over the period 0-<4 years for these two indicators is considered adequate for the Australian indicators.

1. Percent ever breastfed

This indicator is the same as Australian indicator 1 and can be reported as calculated.

2. Percent breastfed to at least 4 months of age and 6 months of age

This indicator can be calculated from Australian indicator 2- 'percent breastfed at each completed month of age to 12 months'. The calculation of the indicator is: (the number of children who were breastfed to at least 4 months [and 6 months], divided by all survey children who have reached 4 months [and 6 months] of age) x 100.

3. Median duration of breastfeeding

This indicator differs from Australian indicator 3; 'median duration of breastfeeding among ever breastfed infants/children' in that it is a median duration among all children in the reference age range 0-<4 years rather than only those who were initially breastfed. The calculation is similar to that described for Australian indicator 3, with the exception that the denominator is all children in the survey. Children who are still breastfeeding at the time of the survey are included in the calculation to avoid selection bias. Steps in the calculation include:

- Count the number of children aged 1 month or older at the time of the survey
- Amongst these, count the number who were still breastfeeding at this age (including those that stopped breastfeeding at an older age)
- The prevalence of breastfeeding among children at 1 month of age is: the number still breastfeeding at this age, divided by the total number of children aged 1 month or older at the time of the survey X 100

- Repeat this for ages 2 to at 12 months, or until the completed month of age when at least 50% of the survey children have stopped breastfeeding (50% of the total sample).
- Data heaping may occur if mothers/carers round their reports of duration of breastfeeding. If this has occurred, use a method for data smoothing, such as calculating a line of best fit, or a 3 month moving average (such as used by WHO) to adjust the raw percentage estimates.

4. Percent of infants 0-4 months, and 0-6 months exclusively breastfed in previous 24 hours

This indicator can be calculated from Australian indicator 4 ‘percent exclusively breastfed in previous 24 hours among infants at each completed month of age to 6 months’. The indicator is the number of infants aged 0-4 months [and 0-6 months] who were exclusively breastfeeding during the previous 24 hours, divided by the total number of infants 0-4 months [and 0-6 months] x 100.

5. Percent of infants 0-4 months, and 0-6 months predominantly breastfed in previous 24 hours

This indicator can be calculated from Australian indicator 5 ‘percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months’. The percent predominantly breastfed at each completed month of age to 6 months can be calculated by subtracting the percentage exclusively breastfed at each month of age, from the percentage fully breastfed at each month of age. The rate for 0-4 months [and 0-6 months] can then be calculated as the number of infants aged 0-4 months [and 0-6 months] who were predominantly breastfeeding during the previous 24 hours, divided by the total number of infants 0-4 months [and 0-6 months] x 100.

Appendix 8: Stakeholders invited to comment on discussion paper

Name	Organisation
Mr Michael Roff	Australian Private Hospitals Association Ltd
Dr David Topping	CSIRO - Health Sciences and Nutrition Division
Ms Anne Cahill	Women's Hospitals Australia
Mr David Forsythe	Infant Formula Manufacturers Association of Australia Inc
Mr Peter Kelly	Infant Formula Manufacturers Association of Australia Inc
Mrs Kathy Shelton	Australian Breastfeeding Association
Mrs Jane Thompson	The Australian Lactation Consultants' Association
Ms Anne Robertson	Royal Australian College of Obstetricians and Gynaecologists
Mr Peter Saunders	Pharmaceutical Society of Australia
Dr Shirley Bowen	ACT Department of Health, Housing and Community Care
Dr John Scott	Queensland Health Department
Mr Paul Stephenson	Health Department of Western Australia
Ms Vicki Rundle	Department of Health and Human Services
Mr Ian Halkett	Department of Human Services SA
Mr Jim Davidson	Department of Human Services SA
Professor John Catford	Victorian Department of Human Services
Ms Noeline Swanson	Territory Health Services
Dr Andrew Wilson	NSW Department of Health
Ms Liz Furler	Royal Australian College of General Practitioners
Professor John Catford	Strategic Intergovernmental Nutrition Alliance

Professor Colin Binns	Curtin University
Ms Helen Hopkins	Consumers' Health Forum
Ms Alana Street	Australian College of Midwives Inc
Ms Merrilynne Hayes	Nutrition Australia
Dr Peter Williams	Dietitians Association of Australia
Ms Pieta-Rae Laut	Public Health Association of Australia
Mr Russell Reinhard	Quality Improvement in Health and Community Services
Dr Marjorie Pawsey	Australian Council on Healthcare Standards
Ms Margaret Norington	Office for Aboriginal & Torres Strait Islander Health
Mr Peter Liehne	Australia New Zealand Food Authority
Dr Janet Currie	Australian Health Promotion Association
Professor Mark Wahlqvist	Monash Asia Institute
Ms Carolyn Smith	Commonwealth Department Health and Aged Care
Ms Elizabeth Aitken	Ministry of Health New Zealand
Ms Karen Codling	UNICEF EAPRO
Ms Mirriam Labock	UNICEF
Dr Werner Schultink	UNICEF - Nutrition Section
Mrs Randa Saadeh	World Health Organization
Dr L. Tommaso Cavalli-Sforza	WHO Regional Office for the Western Pacific
Mr Craig Ritchie	NACCHO National Office
Ms Jill Gallagher	VACCHO
Ms Sandra Bailey	NSW AH&MRC
Mr Mick Adams	QAIHF

Cephas Stanley	AHCSA
Ms Di Potter	WAACCHO
Ms Heather Sculthorpe	TAHS
Mr Daniel McAullay	TVW Telethon Institute for Child Health and Research
Assoc Prof Ian Anderson	University of Melbourne
Dr Janis Shaw	Australian Bureau of Statistics
Professor Tony Barnes	Coop Research for Aboriginal and Tropical Health
Ms Dorothy Mackerras	Menzies School of Health Research
Mr Stanley Nangala	Heads of Aboriginal Health Units
Dr Peter Hartmann	The University of Western Australia
Ms Maureen Minchin	
Doctor Maria Dudycz	Advisory Panel for the Marketing in Australia of Infant Formula
