

GUEST EDITORIAL: BREASTFEEDING AND THE PUBLIC'S HEALTH

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International recommendations advise that women exclusively breastfeed for the first six months and continue to breastfeed until their infants are at least 12 months of age. These recommendations have been endorsed by the Australian National Health and Medical Research Council and included in the *Infant feeding guidelines for health workers* (see page 41), which have been incorporated in their *Dietary guidelines for children and adolescents in Australia*. The good news is that over 80 per cent of Australian women start breastfeeding. However, most stop before their infants reach six months of age.¹ In addition, most women who do breastfeed for six months add other foods and/or breastmilk substitutes to their infant's diet early in life, despite recommendations to the contrary.

This special issue of the *NSW Public Health Bulletin* brings together a number of experts in public health and nutrition and in infant and child feeding. It summarises some of the recent research, policies and programs relating to the public health challenge of promoting and supporting breastfeeding of infants. Articles report on reviews of scientific evidence about the health benefits of breastfeeding for infants in developed countries such as Australia; summarise recent data about breastfeeding practices in the NSW population; organise the fragmented research on determinants of breastfeeding into a coherent conceptual framework; and examine current evidence in systematic reviews concerning the effectiveness of interventions to promote breastfeeding. This issue also describes contemporary interventions in Australian hospitals and in

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public policy that could be expanded to achieve even better results with breastfeeding. Several of the articles summarise, or refer to, recently published reports. The CD included with this issue holds the full pdf versions of these reports to allow easy access by health practitioners.

The term 'breastfeeding' can be used to describe many different patterns of infant feeding. The lack of agreed definitions and consistent use of terms contributes to confusion in interpreting research results, measuring trends in breastfeeding behaviour and tailoring interventions. Internationally and in Australia, steps have been taken to standardise the terminology used by health professionals. In 1991, the World Health Organization proposed a set of definitions of breastfeeding terms to guide their data collection for the Global Data Bank on breastfeeding.² In 2001, these definitions were reviewed and recommended

for use in monitoring breastfeeding in Australia.³ These definitions are presented below. As they are used throughout this special issue, for easy reference the definitions are also presented in Box 1 along with the national indicators for monitoring breastfeeding. The rationale for these definitions, and how they evolved, is described more fully in *Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps* by Webb et al which is included on the attached CD.

An **exclusively breastfed** infant has received only breastmilk from his/her mother or 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.

BOX 1

RECOMMENDED INDICATORS AND DEFINITIONS FOR MONITORING BREASTFEEDING IN AUSTRALIA

The following indicators and definitions, derived from those developed by the World Health Organization, have been recommended for monitoring breastfeeding in Australia. For more details see the reference below.

Indicators based on mothers' recalled practice among children under four years

1. Percentage ever breastfed
2. Percentage 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 (during previous 24 hours) among infants up to six completed months of age*

4. Percentage exclusively breastfed in the previous 24 hours among infants at each completed month of age up to six completed months
5. Percentage fully breastfed in the previous 24 hours among infants at each completed month of age up to six completed months**
6. Percentage receiving solid foods in the previous 24 hours among infants at each completed month of age up to six completed months
7. Percentage receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age up to six completed months

Definitions

An **exclusively breastfed** infant has received only breastmilk from his/her mother or 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.

An **ever breastfed** infant has been put to the breast, if only once, or has received expressed breastmilk, even if he or she has never been put to the breast.

A **fully breastfed** infant receives breastmilk as the main source of nourishment. That is, the infant is exclusively breastfed and receives only breastmilk with no other liquids or solids (except vitamins, mineral supplements, or medicines) OR is **predominantly breastfed** and receives breastmilk and water, water-based drinks, fruit juice, or oral rehydration salts but not breastmilk substitutes or solids. The fully breastfed rate is thus the combined rate of exclusively breastfed and predominantly breastfed.

* up to but not including seven months of age

** *Full breastfeeding* is retained as an indicator to maintain consistency with measurements made in previous National Health Surveys and state computer-assisted telephone interview surveys.

Source: Webb K, Marks G, Lund-Adams M, Rutishauser IHE, Abraham B. *Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps*. Canberra: Australian Food and Nutrition Monitoring Unit, Commonwealth Department of Health and Aged Care; 2001. Available on the CD included with this issue of the *NSW Public Health Bulletin*.

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As stated in the article 'Describing breastfeeding practices in NSW using data from the NSW Child Health Survey 2001 by Hector and Webb in this issue, most women (90 per cent) in NSW start breastfeeding their infants. Although we lack information about the long-term trends in breastfeeding for NSW, we know that in Australia rates of breastfeeding initiation are high, and have remained so in the past decade.¹ However, the duration of breastfeeding is considerably shorter than recommended, and has stayed the same since 1995.¹ We may even have gone backwards with regard to exclusive breastfeeding, because solid foods appear to be added earlier than they were a decade ago.¹ These trends are occurring despite the accumulating scientific evidence that exclusive breastfeeding and breastfeeding for longer periods have many health advantages for women and children (see Allen and Hector, 'Benefits of breastfeeding', in this issue).

Why is it that despite endorsement by the country's highest health council and the promotion efforts of health authorities and non-government organisations, most women who start breastfeeding give up very early? The answer to this question lies in a better understanding of the barriers to breastfeeding. The conceptual framework described by Hector et al in 'Factors affecting breastfeeding practices' in this issue pulls together the many potential determinants of what is a very complex behaviour—a behaviour which is influenced by not only the knowledge, attitudes and skills of the individual mother but also by the extent to which she is supported by a range of institutions, community groups and structures which vary from hospitals and community services, to home and family, the workplace, the community, economic structures and policies, as well as underlying societal norms.

Research is required in a number of areas. We need to find out how long infants should ideally be breastfed on the basis of health outcomes observed in longitudinal studies. This would assure us that the Australian National Health and Medical Research Council recommendations are valid. We also need to clarify the objectives and anticipated benefits of breastfeeding interventions. In order to inform future policy and intervention planning, we need a methodical and consistent approach to research on the broad range

of factors that affect breastfeeding and on the effects of interventions to modify these factors.

Current approaches to the promotion of breastfeeding in Australia have two important characteristics. First, most concentrate on the individual mother, based on the implicit assumption that she operates as an individual decision-maker relatively isolated from the rest of the community (see Hector and King, 'Interventions to encourage and support breastfeeding', in this issue). On this basis, efforts are directed to mothers-to-be and new mothers, with limited acknowledgment that there are many other wider influences on their breastfeeding decisions.

Other interventions address some of the group-level (environmental) determinants of breastfeeding behaviours, but are limited in their scope and coverage in Australia. Thus, many hospitals now encourage rooming-in, do not give discharge packs of supplementary feeding formula (breastmilk substitutes) and encourage early mother–infant contact. So far, three hospitals in NSW have formalised their activities to support breastfeeding by receiving accreditation as Baby Friendly Hospitals (see Heads, 'The Baby Friendly Hospital Initiative: a case study from NSW', in this issue). Australia is a signatory to the World Health Organization Code of Marketing of Breastmilk Substitutes, yet the Code has no authority here and monitoring of compliance is limited (see McVeagh, 'The WHO code of marketing of breastmilk substitutes and subsequent resolutions', in this issue). Non-government organisations such as the Australian Breastfeeding Association, traditionally known for their provision of telephone counselling services and peer support for new mothers, are beginning to move into environmental support strategies such as breastfeeding-friendly facilities in public places and workplace provisions for breastfeeding mothers. The Australian Government Department of Health and Ageing has produced and disseminated resources which support 'balancing breastfeeding and work'.⁴ Systematic implementation and evaluation of workplace strategies has yet to be done in Australia. Edgar, in his recently published book, *The war over work*, describes the emerging family-friendly workplace movement in Australia among large private sector corporations.⁵ Despite the savings to businesses in reduced staff turnover and higher productivity, Edgar believes that the challenges of bringing smaller businesses as well as government and non-government sectors on board with these initiatives are not to be underestimated, given the widespread view that the costs of these initiatives are high, and that family 'issues' are private responsibilities rather than employers' problems.

A second characteristic of current breastfeeding interventions is the lack of coordination of activities. Between 1996 and 2001 the National Breastfeeding Strategy provided a focus for breastfeeding promotion and support at the national level, but there has been no follow-up coordination of the components of this initiative.⁶ The WHO *Global*

strategy for infant and young child feeding recommends the appointment of 'a national breastfeeding coordinator with appropriate authority', and establishment of a 'multisectoral national breastfeeding committee composed of representatives from relevant government departments, nongovernmental organizations, and health professional associations'.⁷ More than a hundred countries have established these coordination mechanisms to ensure a strategic approach to breastfeeding promotion and research. Australia has yet to do so.

Coordination is an issue at the service provision level as well. While the value of breastfeeding support from health professionals is well documented (see Hector and King, 'Interventions to encourage and support breastfeeding', in this issue) and is well established in Australian health care services, there is little coordination between the various providers of this support. For example, prenatal and postnatal counselling and education, hospital policies and procedures, and follow-up support given by child and family health nurses, lactation consultants, general practitioners and other groups are often developed in isolation and with little cross-discipline consultation. Some area health services have established breastfeeding coalitions to address this issue. The NSW Health Breastfeeding Project (described by Macoun in 'The NSW Health Breastfeeding Project' in this issue) is one approach taken by a broad group of service providers and other stakeholders to work out how best to coordinate their activities.

Evaluations of the effects of some of these interventions are described in the article by Hector and King, 'Interventions to encourage and support breastfeeding'. Whilst we now have information about the effectiveness of some of these approaches, the overall evidence base is small and suffers from the same two main characteristics described above; ie, studies are limited mostly to interventions that target individual level influences on breastfeeding, and the evaluations are not conducted in a coordinated way, preventing the identification of independent and cumulative effects of various types and levels of interventions.

In our view the next steps to improve breastfeeding practices in Australia, in addition to the research outlined above, should include the use of the information available about intervention effectiveness to improve mother-directed services; the design, implementation and evaluation of group and societal level interventions; and greater coordination of activities within and across these levels. Such coordination will be necessary at the regional/area level but will also involve efforts at the state and federal level to influence the broader community norms and expectations around breastfeeding and parenting.

Of course, once such efforts are underway it will be important to know whether they are improving breastfeeding practices at the population level. We now have agreed indicators for monitoring breastfeeding in Australia (see Box 1) and it is critical that agencies that collect health-related data for local areas, states and the Australian Government adopt and report on these indicators. This will enable us to assess whether our efforts are leading to a closer alignment of population breastfeeding practices with recommended infant feeding practices.

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NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL INFANT FEEDING GUIDELINES FOR HEALTH WORKERS, 2003

In 2003, the National Health and Medical Research Council updated Australia's *Infant Feeding Guidelines for Health Workers* and incorporated them into the *Dietary guidelines for children and adolescents in Australia*.¹ The new *Infant Feeding Guidelines* recommend that as many infants as possible in Australia be exclusively breastfed until six months of age and that mothers continue breastfeeding until their infants are 12 months of age, and beyond if both mother and infant wish.

'All health workers have an obligation to promote breastfeeding in the community and to ensure that best practice in breastfeeding is followed.'

The *Infant Feeding Guidelines* provide information to help health professionals encourage, support and promote breastfeeding. They:

- endorse breastfeeding as the normal way to feed all infants;
- recommend ways that community health, primary health care services, hospitals and workplaces can help to increase breastfeeding initiation rates and duration;
- discuss the few contra-indications for breastfeeding, such as the mother taking drugs, and provide strategies to identify these contra-indications and reduce their impact;
- provide guidelines for appropriate support and advice when an infant is not receiving breastmilk;
- provide recommendations for infant feeding, including the use of fluids other than breastmilk, the timing for introducing solid food, caring for infants' food and nutrition in the second year of life;
- discuss other aspects of infant nutrition such as food allergies, colic, constipation, dietary fat, dental caries, diarrhoeal disease, iron deficiency anaemia, vegetarian diets, feeding low birthweight infants and foods not suitable for infants.

Health workers will find the following particularly helpful:

- a glossary of terms associated with infant feeding and breastfeeding;
- descriptions of initiatives such as the WHO International Code of Marketing of Breastmilk Substitutes (including an interpretation of the WHO Code for health workers in Australia, health workers' responsibilities under the Code and how to report a breach of the Code), the Baby Friendly Hospital Initiative and the National Breastfeeding Strategy;
- a summary of the health benefits of breastfeeding for mother and infant;
- a description of the physiology of breastfeeding and normal infant behaviour;
- practical strategies for health workers to assist with initiation, establishment and maintenance of breastfeeding among their clients (including strategies for the 'early days' and common problems and their management);
- guidelines for expressing and storing breastmilk (particularly useful for supporting working mothers);
- the need for informed consent for complementary feeds in hospital;
- Australian nutrition and breastfeeding resources and websites.

Other items of interest include:

- a discussion of measurement of breastfeeding rates;
- information about the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding and the Royal Australian College of General Practitioners Breastfeeding Position Statement;
- a description of the composition of human milk.

REFERENCE

1. National Health and Medical Research Council. *Dietary guidelines for children and adolescents in Australia—incorporating the infant feeding guidelines for health workers*. Commonwealth of Australia, 2003. ISBN Print:1864961538 Online:1864961473.

Dietary guidelines for children and adolescents in Australia is sold through AusInfo Government Info Bookshops. The toll-free number for purchases is 132 447. The Infant Feeding Guidelines are included on the CD enclosed with this issue of the *Bulletin*, and can also be found on the Internet at www.nhmrc.gov.au/publications/pdf/n34.pdf . ☒

BENEFITS OF BREASTFEEDING

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Human milk, or breastmilk, is uniquely engineered for human infants, and is the biologically 'natural' way to feed infants. Breastfeeding, in comparison to feeding breastmilk substitutes such as infant formula, has numerous health benefits. Despite this, infant formula has been actively promoted as a product equivalent to breastmilk. Consequently, evidence describing the health advantages of breastmilk and breastfeeding needs to 'argue the case' for breastfeeding.

Evidence of a causal relationship between breastfeeding and health outcomes has been difficult to obtain, in part because it would be unethical to conduct randomised controlled trials of infant feeding methods. Nevertheless, consistent evidence from well designed cohort and case-control studies, many of which demonstrate a positive dose-response relationship, have contributed to a sound evidence base. While the health benefits of breastfeeding infants in less developed countries, particularly in relation to infectious gastrointestinal disease, have long been recognised, the benefits in developed countries, like Australia, are less accepted.

This article provides an overview of the evidence regarding the health benefits of breastfeeding in developed countries. The range of benefits and the strength of the evidence is summarised, drawing where possible on systematic reviews and meta-analyses. Attempts to express these health benefits as economic benefits are also described. There are a few situations in which breastfeeding is contraindicated, for example for HIV/AIDS infected or drug addicted mothers,^{1,2} and these are not explored in this article.

SEARCH METHOD

The published literature was searched for:

- recent systematic reviews and meta-analyses that applied stringent criteria to the inclusion of studies
- critical reviews (non-systematic) that had been published in the past decade
- original papers, published primarily in the past five years, on the health advantages of breastfeeding.

The search included all OVID electronic databases, including CINAHL, EMBASE, Medline (Medline searched from 1996 to the second week in May 2005) and the Cochrane Library. The keywords used for the search were: *breastfeeding or breastmilk AND health or prevention or protection or reduced risk*; initially using the limits of systematic review,

review and meta-analysis, but subsequently extended to using particular health outcomes as key words. Findings in developed countries were prioritised.

Nine critical reviews covering a range of health outcomes, four narrative reviews of specific health outcomes, 11 meta-analyses of specific health outcomes and 24 papers were chosen to describe the current evidence base.

The strength of association between breastfeeding and a health benefit was classified as *convincing*, *probable* or *possible* (see Table 1). In general, evidence was regarded as *convincing* if the findings were based on one or more cohort studies, with at least a measure of duration of breastfeeding (preferably exclusive breastfeeding), and/or showed a clear dose-response in relation to health outcomes, and was biologically plausible. If the evidence was supported by reviews or meta-analyses then it was also considered to be convincing. *Probable* was generally used to refer to health outcomes for which most studies have found an association, but confirmation is required in more, or better designed studies. *Possible* was used to describe evidence of an association where there were few studies.

The quality of the evidence is limited by methodological issues other than study design, including problems in defining breastfeeding practices and health outcomes, and inadequate control for confounding factors.^{3,4}

THE HEALTH BENEFITS OF BREASTFEEDING

Early reviews considered that the evidence was strongest for a protective effect of breastfeeding against infectious disease⁵, even in developed countries.⁶ However, as illustrated below and summarised in Table 1, there is evidence that breastfeeding protects against a wide range of immediate and longer term adverse health outcomes in developed countries.

Infectious disease

Evidence shows that breastfeeding is protective against infectious diseases such as upper and lower respiratory tract infections, gastrointestinal illnesses, and otitis media, during the infant period and beyond.⁵⁻⁹ The magnitude of the effects are large. For example, a recent meta-analysis of studies conducted in developed countries indicated more than tripling of severe respiratory tract illnesses requiring hospitalisation for formula fed infants compared with those exclusively breastfed for at least four months.¹⁰ The biological plausibility of protection against infectious diseases relates to the immunological^{6,7} and antibacterial¹¹ properties of human milk and the elimination of exposure to pathogens that may be introduced through the preparation and delivery of formula feeding.¹² This evidence is strong for both developed countries and developing countries.⁶ Recent studies also indicate protection against urinary tract infection.^{13,14}

TABLE 1

EVIDENCE FOR HEALTH ADVANTAGES OF BREASTFEEDING TO INFANTS, CHILDREN, MOTHERS, AND ADULTS, IN DEVELOPED COUNTRIES

Level of evidence ¹	Health outcomes for which breastfeeding is protective		
	Infants and children	Chronic disease in childhood and/or later life	Mothers
convincing ²	gastrointestinal illnesses otitis media respiratory tract infections neonatal necrotising enterocolitis		slow maternal recovery from childbirth reduced period of postpartum infertility premenopausal breast cancer
probable ³	asthma and allergy cognitive ability/intelligence some childhood leukaemias urinary tract infection inflammatory bowel disease coeliac disease sudden infant death syndrome	obesity	postmenopausal breast cancer ovarian cancer rheumatoid arthritis
possible ⁴	insulin dependent diabetes mellitus bacteraemia meningitis dental occlusion	ischaemic heart disease atherosclerosis risk factors for: • atherosclerosis and heart disease • Type 2 diabetes and metabolic syndrome	maternal depression reduced maternal-infant bonding endometrial cancer osteoporosis and bone fracture no or slow return to pre-pregnancy weight

Notes:

1. The classification of evidence of the relationship between breastfeeding and health benefits is based on a comprehensive overview of the evidence base (systematic reviews, meta-analyses, reviews, recent single studies)
2. Convincing: evidence of relationship was critically identified in a review and/or shown in meta-analyses to be significant
3. Probable: most studies have found an association, but confirmation is required in more, or better designed, studies
4. Possible: too few methodologically-sound studies

The immunological properties of breastmilk have been indicated in pre-term infants and very-low-birth-weight infants¹⁵, with evidence of breastmilk offering protection against respiratory symptoms¹⁶ and necrotising enterocolitis.¹⁵

Neurodevelopment and SIDS

The benefits of breastfeeding in children born pre-term or small-for-gestational-age has been shown in relation to neurodevelopment.¹⁷ This association is seen in term infants also. A number of studies have shown a relationship between breastfeeding and cognitive development in children, although meta-analyses^{18,19} have indicated difficulty in distinguishing the effect of breastfeeding from the confounding factor of the mothers' intelligence. A recent study indicated a positive effect throughout childhood, regardless of maternal intelligence.²⁰ The problem of confounding factors was also highlighted in the interpretation of a meta-analysis of breastfeeding and sudden infant death syndrome (SIDS); the combined analysis showed that formula-fed infants were twice as likely to die from SIDS.²¹

Asthma and atopy

One area of scientific controversy is the effect of breastfeeding on the development of asthma and atopy. Some recent studies have reported no difference or an increased risk of asthma and atopic disease in childhood amongst breastfed infants²², particularly in those children with a family history of asthma and allergy.²³ However other methodologically

sound studies have found breastfeeding to be protective against asthma and allergy.^{24,25} On balance, breastfeeding is still recommended for reducing asthma and atopic disease in childhood, even for high risk children.^{26,27} Possible mechanisms linking breastfeeding to asthma and atopy as either a risk or protective factor have been suggested.^{28,29}

Chronic disease risk in childhood and later life

A number of recent meta-analyses and quantitative reviews indicate a protective effect of breastfeeding, even for a short duration, against childhood obesity.^{30,31} As obesity in childhood can lead to obesity as an adult, this suggests a possible role for breastfeeding in the long-term prevention of obesity.³² Further, one review³³ and a recent single study³⁴ have shown that the protective effect against obesity may extend into adulthood.

Several recent studies have shown that breastfeeding may be protective against chronic diseases such as ischaemic heart disease³⁵ and atherosclerosis³⁶ and also for risk markers for diabetes and heart disease, including reduced insulin response³⁷, lipoprotein profile³⁸, and diastolic blood pressure.³⁹ However, longitudinal research, using sound measures of breastfeeding practices, is required to confirm these associations. Most recently a meta-analysis demonstrated that exclusive breastfeeding to six months and longer term breastfeeding reduces systolic blood pressure in older children. The magnitude of the effect was comparable to the published effects of salt restriction and physical activity on

blood pressure in adult populations.⁴⁰ Breastfeeding is also likely to be protective against Type 1 diabetes.^{41,42}

Other diseases and conditions—infants and children

A recent meta-analysis concluded that both short-term and long-term breastfeeding is protective against childhood acute lymphoblastic leukaemia and acute myeloblastic leukaemia.⁴³ However, earlier studies exploring a protective relationship against childhood leukaemia were inconclusive.

Systematic reviews report that studies show 'probable' protection against inflammatory bowel disease (Crohn's disease and ulcerative colitis)⁴⁴ and a recent critical review indicates probable protection against coeliac disease.⁴⁵ There is limited evidence for associations between not breastfeeding and other adverse health outcomes such as dental occlusion⁴⁶ and pyloric stenosis.⁴⁷

Health benefits for the mother

There is compelling evidence that breastfeeding is protective against developing premenopausal and probably postmenopausal breast cancer. There is convincing evidence of a dose-response effect, with longer duration and more exclusive breastfeeding being more protective. A review of 47 studies carried out in 30 countries indicated that the relative risk of breast cancer decreased by 4.3 per cent for every 12 months of breastfeeding.⁴⁸

Studies have consistently shown that hormonal changes associated with breastfeeding help recovery after childbirth and suppress maternal fertility.^{49,50} The extent of these changes is again dependent on the frequency, intensity and duration of breastfeeding.

Evidence from two recent case control studies indicates that breastfeeding may protect against ovarian cancer^{51,52}, and two large cohort studies showed protective effects for rheumatoid arthritis, the latter with a dose response effect.^{49,53} Increased postpartum weight loss, shown in a number of studies, is likely given that lactation requires an additional 500–640 calories per day.⁴⁹ Robust evidence is accumulating that breastfeeding decreases maternal depression⁵⁴ and improves mother-infant bonding.⁵⁵ The evidence for protection against endometrial cancers and osteoporosis (and hip fracture) is mixed, although biological plausibility lends strength to the argument.^{49,50}

ECONOMIC BENEFITS OF IMPROVED BREASTFEEDING PRACTICES

The illnesses for which there is convincing evidence of a protective effect of breastfeeding are among the major health problems in Australia and contribute significantly to the health burden. However, research into the costs and benefits of breastfeeding is poorly developed. Most economic analyses of breastfeeding have focused on a small number of infant illnesses and thus considerably underestimate the total costs^{56,57} resulting from low rates of breastfeeding.

These analyses also focus on the infant period alone, and exclude many infant and maternal illnesses, as well as the costs of increased rates of longer term chronic diseases. Many of the potential costs are currently unquantified and difficult to measure; consequently analyses commonly measure direct health costs. Indirect costs (for example, cost of infant formula, equipment, storage and preparation; cost of medicine and staff time for treating sick infants), and out-of-hospital costs to the health system (for example, physician visits) are seldom measured.

An alternative way of approaching breastfeeding in economic analysis has been to consider breastmilk as a food commodity that contributes to the total food supply (and therefore the Gross Domestic Product). In a novel analysis, breastmilk was considered to yield a net economic benefit (after adjustment for a small increase in maternal food consumption) of a minimum of \$2.2 billion each year in Australia.^{58,59}

Rigorous economic analysis of breastfeeding is a research priority as these results inform advocacy for maintaining the investment in breastfeeding support and promotion.

CONCLUSION

Evidence suggests that there are many health benefits and advantages of breastfeeding at all stages of life. Breastfeeding has been consistently shown to be protective against a large range of immediate and longer term health outcomes that are a significant burden on individuals, the health system and society. While some of the positive effects of breastfeeding on particular health outcomes may be small, these differences are extremely important at the population level. Taken together with the numerous health outcomes where the effect is pronounced, the overall benefits of breastfeeding are likely to be considerable. Better quality research on breastfeeding with regard to the range of health outcomes is required to enhance our understanding of its health benefits, and the mechanisms by which it confers protection.

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A copy of the WHO report *Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life* is included on the CD that accompanies this special issue of the *NSW Public Health Bulletin*. The report is also available at www.who.int/nut/documents/nut_adequacy_of_exc_bfeeding_eng.pdf.

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DESCRIBING BREASTFEEDING PRACTICES IN NEW SOUTH WALES USING DATA FROM THE NSW CHILD HEALTH SURVEY, 2001

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The National Health and Medical Research Council (NH-MRC) have outlined breastfeeding practices conducive to health in their *Dietary Guidelines for Children and Adolescents in Australia*¹, including exclusive breastfeeding to about six months of age, introducing solids appropriately at around six months of age, and extending breastfeeding to at least 12 months of age (see 'National Health and Medical Research Council infant feeding guidelines for health workers', page 41 in this issue). However there is little information about the extent to which population breastfeeding practices are consistent with these guidelines. There is no national monitoring system for collecting and disseminating information about breastfeeding practices in Australia.² The Australian Bureau of Statistics (ABS) National Health Survey collects information about breastfeeding, but the information presented has not been fully aligned with the recommended national indicators (see Box 1: Recommended indicators and definitions used for monitoring breastfeeding in Australia, page 38 in this issue), or the NHMRC guidelines. Consequently, it is difficult to measure changes in breastfeeding practices in the population and to plan and target programs and services to promote breastfeeding.

The NSW Child Health Survey 2001 was the first large-scale population survey conducted in NSW to generate extensive data on breastfeeding practices in a representative sample of the population.³ Prior to this survey there had been limited studies of selected hospitals and communities in NSW, using a variety of definitions, survey questions and sample frames.⁴ Because these surveys reported breastfeeding practices differently and calculated breastfeeding rates for infants of different ages, it has been difficult to combine results to describe the population as a whole.

This paper summarises the findings from a recently published report that described breastfeeding practices in NSW, using data collected in the NSW Child Health Survey 2001. Where possible, we have compared breastfeeding rates from the 2001 Child Health Survey with those from the 1995 ABS National Health Survey to give an indication of trends. We developed 'interim' indicators for use in the analysis of the NSW survey data that reflect the NHMRC guidelines.¹⁰ The full report, *Report on breastfeeding in NSW, 2004*, provides more detail on each of the indicators, including differences in rates between main population subgroups, and between geographic areas defined by area health service boundaries.

METHOD

The NSW Child Health Survey 2001³ used computer-assisted telephone interviews to collect information. The respondents were mothers or carers of children aged up to 12 years from households selected by list-assisted random digit dialling across the state, with a target of 500 children from each of the (then) 17 area health services in NSW. The survey component relating to breastfeeding and infant feeding practices was conducted on a subset of the main survey sample and included carers of infants and children aged 0 to 23 months at the time of the survey, a sample of 1489. Limiting the sample to the very young reduced the period over which the respondents, mainly mothers (87.7%), had to recall their children's feeding practices, a factor shown to influence the validity of information about the timing of the introduction of breastmilk substitutes and solid foods, and the duration of exclusive and predominant breastfeeding.

The 2001 survey questions about breastfeeding were similar to those used in the 1995 National Health Survey.⁵⁻⁷ Both surveys were conducted before the publication of the recommended national breastfeeding indicators,² and the data do not allow full reporting on the national indicators. For example, because consumption of water was not assessed, the prevalence and duration of exclusive breastfeeding cannot be reported; that is, infants predominantly breastfed cannot be distinguished from those exclusively breastfed. However, rates of 'full breastfeeding', are reported. A set of 'interim' breastfeeding indicators (Box 1, below) was developed for the NSW Child Health Survey 2001 and these incorporate the nationally recommended breastfeeding indicators where possible. Several indicators are reported for infants at four months and six months of age. This takes into account the recent change in recommendations by the NHMRC, which previously advised exclusive breastfeeding to, and introduction of solids at, four to six months and now recommends extending exclusive breastfeeding to around six months.^{8,9}

Indicators were calculated using a survival analysis, the Kaplan-Meier method. Indicators were determined for selected population groups based on mothers' characteristics: age, education level, index of social and economic disadvantage, country of birth, English-speaking background/non-English-speaking background, indigenous status and place of residence (urban/rural). Indicators were also calculated for the population in each area health service.

A comprehensive description of the survey methods and analysis is provided in the full reports.^{3,10}

RESULTS

Data for each of the interim indicators for NSW are pre-

BOX 1

INTERIM BREASTFEEDING INDICATORS FOR NSW DEVELOPED FOR THE NSW CHILD HEALTH SURVEY 2001

Among all infants and children 0–2 years:

1. Percentage 'ever breastfed'; ie, received breastmilk at least once
2. Percentage breastfed at each completed month of age to 12 months
3. Percentage regularly* given solid foods before four months and before six months
4. Percentage regularly* given breastmilk substitutes before four months and before six months
- 5A. Percentage fully breastfed to at least four months and six months

Among infants and children up to two years who were 'ever breastfed':

- 5B. Percentage fully breastfed to at least four months and six months
6. Median duration of breastfeeding

* 'Regularly' was defined as 'at least once daily'

Source: Adapted from Webb et al, 2001 'Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps' (see Box 1, page 38, and the report on the CD accompanying this special issue of the *Bulletin*).

sented in Table 1, including comparisons where possible with the 1995 National Health Survey.^{6,7} Findings from the 2001 NSW survey and comparisons with the 1995 survey are summarised below.

Breastfeeding initiation rates in NSW were high in 2001 and appear to have increased since 1995 (Table 1, Figure 1). The percentage of NSW infants 'ever breastfed' was 90.2 per cent in 2001, higher than in many western countries (eg Ireland 34 per cent in 2000¹¹, UK 69 per cent in 2000¹¹, USA 71 per cent in 2003¹²) although lower than those rates achieved in Norway and Sweden (97 to 99 per cent).¹³ While there was no comparable estimate of 'ever breastfed' from the 1995 National Health Survey, the percentage of NSW infants who were breastfeeding at discharge from hospital in 1995 was 78.4 per cent, and had increased by nearly 10 per cent in 2001.¹⁰

In 2001 there was a steady decline in breastfeeding of NSW infants over the first year of life (Figure 1), such that the duration of breastfeeding was considerably shorter than recommended. This was also the case in 1995 (see Table 1). In both 1995 and 2001, about 60 per cent of infants were breastfed until at least three months of age, and 40 per cent were breastfed to six months of age. Less than 20 per cent of infants were still receiving some breastmilk at 12 months of age in 2001; this is similar to the estimated percentage for Australian infants in 1995.

TABLE 1

INDICATORS OF BREASTFEEDING PRACTICES IN NSW, 1995 AND 2001

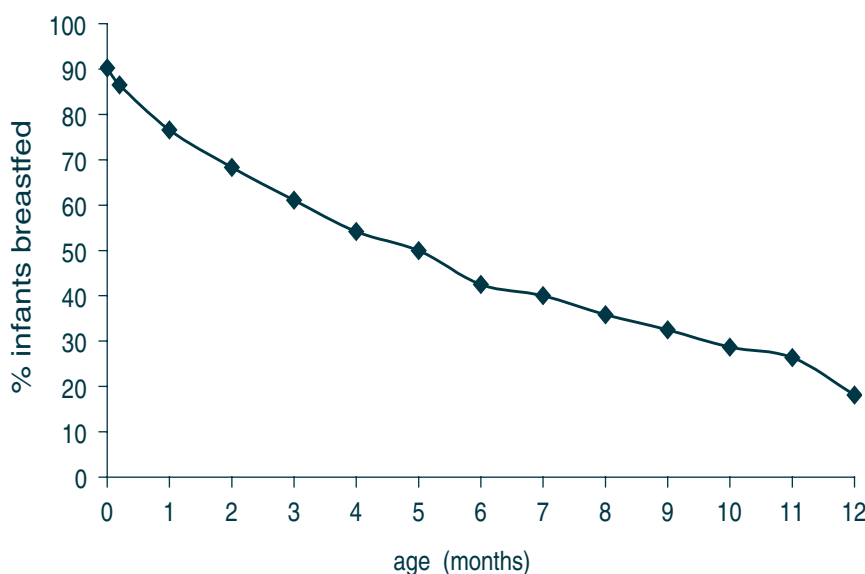
Indicator	NSW Child Health Survey 2001		National Health Survey 1995	
	per cent		NSW sample per cent	Australia per cent
1. Children ever breastfed	90.2	(86.5) [†]	78.4 [†]	81.8*
2. Children breastfed to at least:				
3 months	61.1		60.0	62.6
4 months	54.2		–	46.2
6 months	42.5		44.2	21.2
12 months	18.1		–	
3. Children regularly given solid food				
before 4 months	12.6		–	–
before 6 months	69.8		–	61.5 [‡]
4. Children regularly given breastmilk substitutes				
before 4 months	46.5		–	–
before 6 months	59.6		–	56.9*
5A. Children fully breastfed to at least:				
3 months	48.4		56.6	–
4 months	24.6		–	57.1
6 months	4.6		17.2	18.6

Sources: New South Wales Child Health Survey 2001 (HOIST)³ Donath & Amir^{6,7}

* infant formula only. Does not include cow's milk or other breastmilk substitutes

[†] at hospital discharge

[‡] Donath & Amir⁸ found nearly a 20% difference in the percent receiving solid foods reported by parents with older children at the time of the survey compared with parents of younger children, suggesting a greater error in recall among those parents who had to recall over a longer period.

FIGURE 1**PREVALENCE OF 'ANY BREASTFEEDING' AMONG CHILDREN UP TO 12 MONTHS OF AGE, NSW 2001**

Source: Hector et al, 2001¹⁰

Rates of full breastfeeding were low in 2001 and appear to have declined since 1995. The percentage of NSW infants fully breastfed to six months was low in 1995 (17 per cent), and considerably lower in 2001 (5 per cent). This is consistent with the data showing that a substantial percentage of mothers introduce breastmilk substitutes and solid foods before the recommended six months. In 2001, 70 per cent of NSW infants were given solid foods before six months, compared with 62 per cent in 1995. In 2001, approximately 60 per cent of NSW infants were receiving breastmilk substitutes by six months, similar to the Australian estimate for 1995.

Table 2 shows the prevalence of 'ever breastfed' and 'any breastfeeding' among infants at four, six and 12 months for selected NSW population subgroups.

In 2001, rates of initiation and duration of breastfeeding were notably lower among several population subgroups than in the NSW population as a whole. These subgroups included mothers who were younger (under 25 years), had less education, were most socioeconomically disadvantaged, or of Aboriginal or Torres Strait Islander descent. These groups also had lower rates of full breastfeeding and higher rates of early introduction of solid foods and breastmilk substitutes.¹⁰

DISCUSSION

The NSW Child Health Survey 2001 data provide a baseline against which future measurements of trends in breastfeeding practices can be compared.

There are no data describing long-term trends in breastfeeding practices for NSW and Australia, so the context of our results is unclear. However, there are some indications from comparable or similar data collected in the 1995⁵⁻⁷ and 2001¹⁴ National Health Surveys that the observations in NSW are consistent with recent national trends. Rates of initiation of breastfeeding are high and duration of breastfeeding is considerably shorter than recommended by the NHMRC. These practices have not changed appreciably since 1995. Rates of full breastfeeding are low and probably decreasing because of the earlier introduction of solid foods and breastmilk substitutes to infants.

Data presented here indicate that NSW women are initiating breastfeeding, and most give infants at least some breastmilk until the infants are about three months old. However, most mothers do not breastfeed exclusively or fully, as they introduce solid foods and breastmilk substitutes too early. Consequently, health services development and health promotion efforts should focus on encouraging mothers to breastfeed for longer without using other foods and fluids.

The findings show a significant departure from the NHMRC recommendations on breastfeeding practices among all the women surveyed, but especially among mothers who are very young, less educated, particularly socioeconomically disadvantaged, or of Aboriginal descent. Our findings regarding these vulnerable population subgroups are consistent with those of many previous studies¹⁵⁻²¹ and suggest the need for interventions for these groups over and above efforts to improve rates in the whole

population. Some variation in breastfeeding rates was seen between different area health services in NSW (data not shown), but these differences were generally smaller. Thus, all areas in NSW are faced with the challenge of improving breastfeeding practices.

These data from the NSW 2001 Child Health Survey have limitations. They are not strictly comparable with the National Health Survey estimates because of differences in sampling, some of the survey questions and methods of calculating indicators. Further, the size of NSW survey samples of vulnerable population subgroups and local area health service populations is small, limiting statistical power and confidence in the magnitude of observed differences. The adoption of standardised methods for monitoring breastfeeding by state telephone surveys and the ABS National Health Survey program would enable us to document trends and population differences in breastfeeding practices. The questions used in the NSW Child Health Survey 2001 did not permit all of these indicators to be reported.³ A number of new questions relating to breastfeeding practices have therefore been recommended for ongoing surveys in NSW. The NSW Health Survey Program also plans to increase the sample size of population subgroups

and local area health services through continuous, rather than periodic, data collection methods.

Many factors are likely to contribute to less than optimal infant feeding practices, including those outlined by Hector et al in the paper 'Factors affecting breastfeeding practices' in this issue. Concerted and sustained public health interventions are required that focus on encouraging exclusive breastfeeding during the early months and an extended duration of breastfeeding to at least the recommended 12 months.

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Report on breastfeeding in NSW 2004 is included on the CD that accompanies this special issue of the *NSW Public Health Bulletin*. It is also available at www.health.nsw.gov.au/public-health/health-promotion/nutrition/breastfeeding/index.html and www.cphn.biochem.usyd.edu.au/resources/index.html

TABLE 2

PREVALENCE OF 'EVER BREASTFED' AND ANY BREASTFEEDING AMONG INFANTS TO 4 MONTHS, 6 MONTHS AND 12 MONTHS, BY POPULATION SUB-GROUPS, NSW 2001

Population characteristics of mothers	'ever breastfed' per cent	'any breastfeeding' to at least this age per cent		
		4 months	6 months	12 months
Age				
< 25 yrs	84.5	34.9	27.1	8.4
≥25 yrs	90.4	56.5	44.5	20.9
Education				
Primary/secondary	86.8	44.5	33.5	15.0
Tertiary	96.1	71.4	58.6	23.6
SEIFA*				
1 st quintile (least disadvantaged)	95.5	64.2	55.4	26.9
2 nd quintile	89.8	57.2	45.6	17.8
3 rd quintile	87.3	52.0	36.9	13.7
4 th quintile	92.4	46.8	35.9	17.2
5 th quintile (most disadvantaged)	86.2	50.0	37.2	14.3
Country of birth				
Australia	90.4	53.3	41.8	16.2
Overseas	88.0	56.2	44.7	24.6
Language spoken at home				
English-speaking	90.9	54.4	43.0	18.2
Non-English-speaking	87.9	53.4	40.6	17.8
Indigenous status				
Aboriginal and Torres Strait Islander	72.4	31.3**	22.2	10.0
Not Aboriginal or Torres Strait Islander	90.6	54.6	43.0	18.4
Place of residence				
Urban	89.8	53.1	40.7	17.3
Rural	91.4	58.4	48.9	21.5

* SEIFA (Socioeconomic Indexes for Areas) – index of relative socioeconomic disadvantage (NSW Health)

** extrapolation from 3 months (37.1%) – this data point only

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FACTORS AFFECTING BREASTFEEDING PRACTICES APPLYING A CONCEPTUAL FRAMEWORK

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A previous paper in this issue has described the considerable potential health benefits of breastfeeding. Despite this, survey data show that the majority of NSW women stop breastfeeding in the early months after birth, and most do not breastfeed exclusively for the recommended six months (see Allen and Hector, 'Benefits of breastfeeding', and Hector and Webb, 'Breastfeeding practices in NSW' in this issue). The planning of public health interventions to promote longer and more exclusive breastfeeding practices requires an understanding of the factors that affect breastfeeding (variously referred to as predictors, determinants, barriers, influences, and contributing factors).¹

Our understanding of these factors, their relative importance, how they inter-relate, and how they respond to interventions is hampered by the lack of a coherent approach to research in this area. While there is a large body of published material on the factors affecting breastfeeding, most studies have focused on an extremely narrow range of factors, particularly the socio-demographic characteristics of mothers, and self-reported personal factors. This may be partly attributable to the ease of collecting these data, or the reliance on secondary analyses of 'factors' in data that have been collected for other purposes. A fundamental limitation of research to date is the lack of a conceptual or theoretical base; that is, there is no accepted, comprehensive overview of putative factors to guide researchers in planning their studies, or to assist readers to interpret results of studies in a broad context.

In this paper, we describe some of the limitations of the research on factors affecting breastfeeding. We also describe earlier attempts by ourselves and others to move towards developing a systematic approach to this area and propose a conceptual framework of factors affecting breastfeeding. The framework is intended for use in planning and organising future research and in designing and evaluating interventions to promote recommended breastfeeding practices.

SOME LIMITATIONS OF RESEARCH

Much published research has focused on the attributes of the mother and is often based on surveys that ask women why they didn't breastfeed or why they gave up breastfeeding early; that is, they ask women to provide a self-report of reasons. While the responses to these surveys are useful in identifying how women *explain* their infant feeding deci-

sions, they are only the tip of the iceberg in terms of the underlying reasons why women don't follow recommended feeding practices. Surveys of why women stop breastfeeding provide only indirect and limited insight into the role of wider influences and interactions. Why is this?

First, women are unlikely to be aware of the many influences on their infant feeding behaviour, particularly the broader environmental and socio-cultural influences, such as lack of support. Second, women are often unable to articulate in survey responses, and/or are uncomfortable reporting, less socially acceptable² or 'mother-driven'³ reasons (such as fear of loss of breast shape) for not breastfeeding or stopping breastfeeding early; they tend to report more child-centred reasons³ such as 'child did not want the breast' or reasons beyond the mother's control, notably 'insufficient milk'⁴⁻⁹. 'Insufficient milk' is one of the commonest reasons women give for stopping breastfeeding, yet evidence indicates that less than 5 per cent of women are physiologically incapable of producing an adequate supply of milk.^{7,10,11} Insufficient milk usually results from the woman not breastfeeding frequently enough or long enough, which, in turn, may be affected by circumstances such as the mother returning to work (and working in an environment which does not facilitate expressing breast-milk), or being busy with other siblings, family disruption or dysfunction, or a young mother's desire to minimise time spent in care giving. The explanation of 'insufficient milk' therefore masks a range of underlying factors that undermine breastfeeding.

Survey findings tend to highlight one particular factor or several factors as being particularly important. However, if there are sufficient factors encouraging breastfeeding, any one barrier to breastfeeding may not preclude breastfeeding.⁷ For example, whilst painful nipples are a relatively common reason given for stopping breastfeeding, the majority of women with painful nipples continue breastfeeding.⁹ A critical chain of events may lead to a woman stopping breastfeeding early.^{7,12,13}

TOWARDS A SYSTEMATIC APPROACH

The lack of a systematic approach to selecting factors for investigation in 'determinants' research in breastfeeding has been observed by several researchers.¹⁴⁻¹⁶ As noted by Scott et al, 'no two studies investigate the same factors using comparable methods, thus making it impossible to identify common factors across studies that may be worthy of more inquiry'.¹⁴ The majority of studies implicitly focus on a particular subset of factors, usually those socio-demographic attributes of the mother and family, without due acknowledgement of the wide range of additional potential influences. The socio-demographic characteristics of the mother are actually 'risk markers', those factors that

signal where a problem is occurring, but may not directly contribute to it.¹⁷

A systematic approach to research is therefore required to gain a complete picture of the issues surrounding improved breastfeeding practices, and to identify factors that may be modifiable for intervention planning. A number of researchers have identified lists of possible factors affecting breastfeeding practices, and/or have grouped or categorised these factors.^{16,18,19} In our earlier reports^{1,20}, we suggested a set of categories for classifying factors, adapted from extensive research on influences on patient compliance with health care regimens (see Table 1).^{21,22}

Since then, we have considered a variety of theories that have helped to refine our thinking about the range of factors which influence breastfeeding. Tiedje and others, in their study of influences on mothers feeding decisions, proposed an adaptation of an 'ecological model', in which influences are seen as emanating from relationships between people and groups, and their environments.²³ We extended the focus on environments and the wider social contexts of

TABLE 1

CATEGORIES OF FACTORS AFFECTING BREASTFEEDING PRACTICES

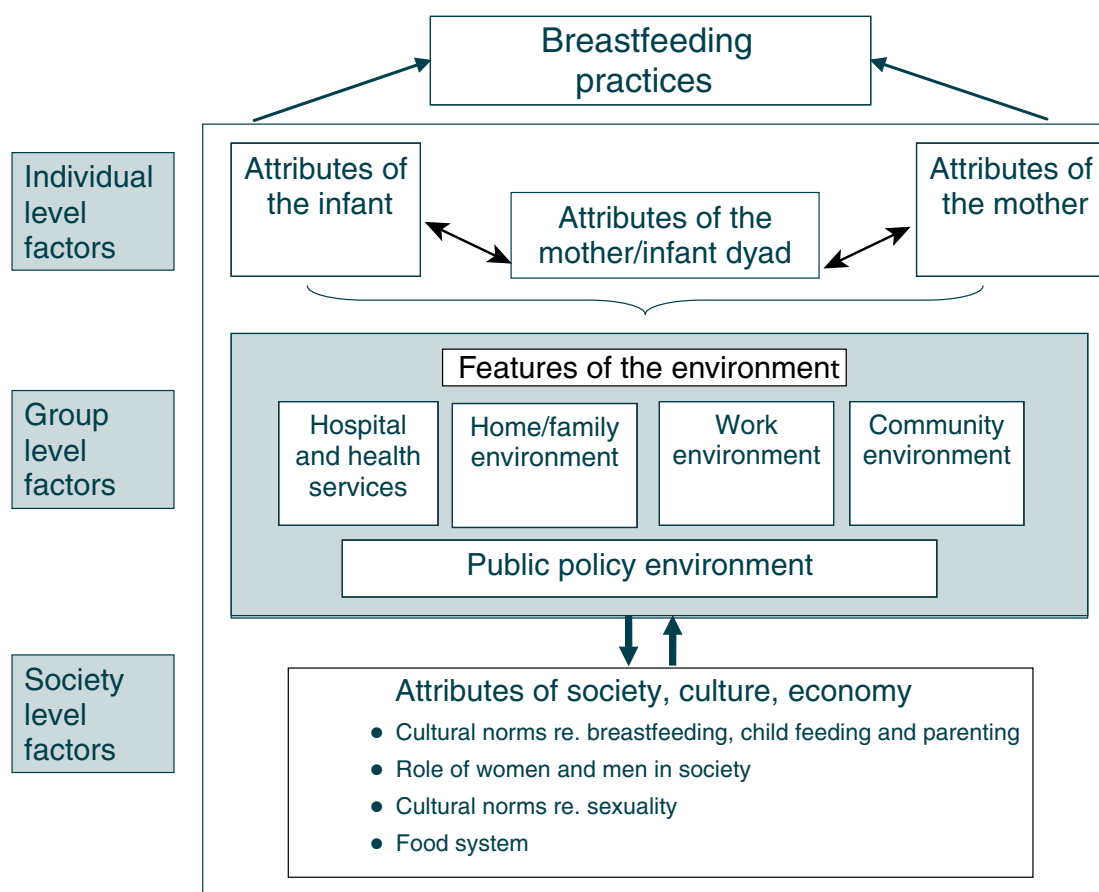
- Socio-demographic characteristics of the mother and family
- Structural and social support
- Health and risk status of mothers and infants
- Mothers' knowledge, attitudes and skills
- Aspects of the feeding regime/practices
- Health services (including hospital and health facilities) organisation, policies and practices
- Socio-cultural, economic and environmental factors

Adapted from Sackett and Haynes^{21,22}

behaviour by considering planning frameworks for health promotion interventions, in particular the Ottawa Charter for Health Promotion.²⁴ This identifies five types of interventions: developing personal skills, reorienting health services, creating supportive environments, developing

FIGURE 1

A CONCEPTUAL FRAMEWORK OF FACTORS AFFECTING BREASTFEEDING PRACTICES



healthy public policy and strengthening community action. Such actions are variously directed to modifying individual and personal factors, but more so to modify the environments in which individuals live and breastfeed.

Consequently, we developed a conceptual framework for understanding the influences on breastfeeding that incorporates a variety of elements of relevant theories for understanding health behaviour and for planning effective public health interventions to influence health behaviour.

CONCEPTUAL FRAMEWORK OF FACTORS AFFECTING BREASTFEEDING

The conceptual framework (Figure 1) proposes three levels of factors that influence breastfeeding practices: individual, group and society. The framework can be used to generate hypotheses about factors affecting breastfeeding and the types of interventions that might be used to address them.

Individual level factors relate directly to the mother, infant, and the 'mother-infant dyad'. They include the mother's intention to breastfeed, her knowledge, skills and parenting experience, the birth experience, health and risk status of mothers and infants, and the nature of early interaction between mother and infant. Each of these can directly influence the initiation and duration of breastfeeding, and are frequently correlated with social and demographic variables.

Group level factors are the attributes of the environments in which mothers and infants find themselves, the attributes that enable mothers to breastfeed. Environments with a direct influence on mothers and infants include:

- the hospital and health facilities environment, in which practices and procedures such as infants routinely rooming-in with mothers to allow demand feeding, postpartum skin-to-skin contact and providing professional support with breastfeeding technique difficulties influence the early feeding experience and the follow-up care and support,
- the home and peer environment, where physical and social factors such as size of household, parity, family circumstances, partner attitudes and support, and peer support affect the time, energy and resolve that mothers have for breastfeeding
- the work environment, in which policies, practices and facilities such as work hours and flexibility, facilities and policies that enable on-site expressing and storing of breastmilk influence mother's ability to combine work and breastfeeding
- the community environment, which signals the extent to which breastfeeding is recognised as a norm, and reinforced by facilities and policies in public places, for example parenting rooms in shopping centres and entertainment venues, 'breastfeeding friendly' public transport, restaurants

- the public policy environment, which modifies how each of these environments influence mother's feeding decisions. For example, benefits such as maternity and paternity leave, childcare allowances and health insurance have a significant impact on the hospital, home, and work environments that in turn, influence infant feeding decisions directly.

Societal level factors influence the acceptability and expectations about breastfeeding and provide the background or the context in which mothers' feeding practices occur. These include cultural norms regarding breastfeeding, child feeding, and parenting; the role of women in society, including how working outside the home is valued; the extent to which men's social role includes support for breastfeeding mothers; the extent to which exposing breasts for feeding is complicated by cultural norms regarding sexuality; and the economic importance of products such as breastmilk substitutes and complementary foods in the food system.

Group level and societal level influences may interact in either positive or negative ways with maternal knowledge and skills. For example, a mother may be predisposed to breastfeed, but a non-supportive environment in the hospital may lead to her deciding to stop breastfeeding early. Similarly, even if breastfeeding is still occurring at hospital-discharge, a lack of support at home or in the community may also lead to her stopping early. Again, broader societal attitudes about sexuality, and especially breasts, can influence the manner and degree of community support.

IMPLICATIONS FOR INTERVENTIONS RESEARCH

Factors operating at various levels may negate one another, so a broader view is required when designing attempts to improve breastfeeding rates and duration. Thus, interventions directed only at persuading mothers to breastfeed may fail if they are not complemented by other interventions that support her in hospital, at home, and at work. Indeed, aiming interventions at any one factor affecting breastfeeding is likely to be less successful in achieving and maintaining change than those addressing multiple factors, across several categories, and at several levels.


The main purpose of research on factors affecting breastfeeding is to inform the design of interventions. As well, the results of intervention research can provide insights about significant influences on breastfeeding. Factors that cannot be elucidated by qualitative or cross-sectional studies, such as the effect of health professional training, or changes to health service practices (for example the Baby Friendly Hospital Initiative), can be determined to some extent by the success, or otherwise, of methodologically sound, well-evaluated interventions.

SUMMARY

Knowledge about factors affecting breastfeeding can be developed by further research on underlying factors and

by drawing out the implications and lessons from intervention research. The use of a conceptual framework to guide this research and the interpretation of results can help us to understand the relative importance of different factors, and how they interact, in turn, helping us to design effective interventions.

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INTERVENTIONS TO ENCOURAGE AND SUPPORT BREASTFEEDING

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The need for effective interventions to encourage and support optimal breastfeeding practices has been established.^{1,2} The previous paper in this issue discusses the range of potential factors that influence breastfeeding practices.³ This article provides an overview of the potential interventions that address these factors. It also summarises the findings of an evaluation of systematic reviews and meta-analyses of interventions that has recently been published in the report 'Overview of recent reviews of interventions to promote and support breastfeeding'.⁴

POTENTIAL INTERVENTIONS TO PROMOTE BREASTFEEDING

The conceptual framework of factors that influence breastfeeding practices, described in the previous paper,³ provides a basis for identifying potential interventions. Table 1 shows the links between these factors, typical breastfeeding strategy objectives and examples of potential interventions. There is congruence between the types of interventions outlined in Table 1 to promote breastfeeding, and the five generic health promotion action areas given in the Ottawa Charter for Health Promotion⁵: develop personal skills, reorient health services, create supportive environments, build healthy public policy, and strengthen community action.

Individual level factors

Prenatal interventions need to encourage mothers to breastfeed. Early postnatal interventions aim to increase breastfeeding-related knowledge and practical skills. Interventions that facilitate or maintain the good health status of mother and infant are also required. Education, professional support and peer support are the main types of intervention at the individual level.

Group level factors

Hospital practices can ensure that the conditions immediately after birth and during the hospital stay are conducive to and supportive of breastfeeding. Health professional training is aimed at ensuring that mothers receive consistent, relevant, and useful advice with respect to breastfeeding practices and problems. Provision of, and referrals to, well-coordinated postnatal breastfeeding support services (for example, lactation consultants) is an objective of the hospital and health service environment that contributes to the mother's maintenance of breastfeeding. Public policies such as those that limit the marketing of breastmilk sub-

stitutes in hospitals ensure that the decision to breastfeed is not undermined by, for example, mothers being given hospital discharge packs of infant formula.

After being discharged from hospital, mothers need help to maintain exclusive breastfeeding for several months. Creating a home and family environment that is conducive to exclusive breastfeeding may require strategies such as increasing appropriate support (for example, family support services) and strengthening breastfeeding and parenting skills, along with advocacy for public policies (for example, maternity/paternity benefits).

Interventions that enable women to combine work and breastfeeding are crucial. Supportive work environments require the provision of, and underlying policies for, physical facilities that enable mothers to breastfeed and/or to express and store breastmilk for later feeding (such as private rooms and access to refrigeration). Flexible employment practices (including parental leave), breaks from work, and circulars to staff about breastfeeding-friendly workplaces are necessary. Such workplace policies help create norms about the acceptability of combining breastfeeding and working.

Support from community members and organisations, together with advocacy for public facilities and policies that make breastfeeding easier outside the home, are needed. Examples of interventions include lay and peer support groups for breastfeeding, feeding/parenting rooms in public places, and breastfeeding-friendly businesses.

Society level factors

The objectives of strategies to influence the wider social, cultural and economic environment include promoting social norms that encourage breastfeeding, and social roles for men and women that are consistent with good breastfeeding practices. Advocating for reforms in the economic and health systems to provide structures and incentives for breastfeeding are important. Examples of such interventions include social marketing (including media campaigns); high school curricula dealing with parenting skills and norms and sexuality; health insurance incentives for breastfeeding; and implementation of the *WHO Code for marketing of breastmilk substitutes*.⁶

Healthy public policy is an overarching strategy that aims to modify environments, including the broader social, cultural and economic environments, to support mothers to initiate and maintain breastfeeding.

SYSTEMATIC REVIEWS OF INTERVENTIONS TO PROMOTE BREASTFEEDING

Evidence-based practice relies on the findings of sound evaluation research to determine whether an intervention is likely to be effective.^{7,8} Systematic reviews and meta-

TABLE 1

POINTS OF INTERVENTION, STRATEGY OBJECTIVES AND EXAMPLES OF INTERVENTIONS TO IMPROVE BREASTFEEDING PRACTICES

Factors affecting breastfeeding (from conceptual framework*)	Group level				Society level
	Individual level	Hospital and health services environments	Home/family/ friends environments	Work environment	
Strategy objectives*	Increase knowledge of breastfeeding in mothers Improve mothers attitudes towards breastfeeding Develop personal skills (of mothers) to breastfeed	Implement health service practices (supported by policy) supportive of breastfeeding and no practices that undermine breastfeeding Ensure all health professionals associated with infant feeding support breastfeeding	Provide physical and mental support to mother to encourage and enable breastfeeding	Implement public policies to enable women to successfully combine work and breastfeeding	Development of social and cultural norms to breastfeed Economic structures and incentives that support breastfeeding
Examples of interventions	Education – provision of factual or technical information about breastfeeding – e.g. antenatal classes, leaflets Professional support (crisis intervention for physical problems, e.g. breastfeeding clinic) Home visits by nurse or peer support (professional and/or peer support) Referral advice (professional support)	Hospital practices concerning the mother and baby (rooming-in, demand feeding, early skin-to-skin contact, no commercial discharge packs, non-use of teats or pacifiers) Training of health professionals (nurses, GPs, obstetricians, paediatricians) Home visits, breastfeeding clinics, lactation consultants (professional education and support) Education (e.g. dissemination of leaflets) Referral advice (professional support)	Peer support (one-on-one) Lay support e.g. mothers groups Social support – maternity leave benefits; paternity leave benefits	Provision of breast pump and rooms and breaks for expressing breastmilk Dissemination of information with regard to breastfeeding and maternity entitlements to all new employees	Social marketing (e.g. media campaigns) Advocacy School curricula Social/economic support – Health insurance supportive of breastfeeding; maternity leave benefits WHO Code of Marketing Breastmilk Substitutes

* These align well with generic strategies outlined by the Ottawa Charter for Health Promotion, which include developing personal skills, reorienting health services, creating supportive environments, setting healthy public policy, and community action⁵.

TABLE 2

SUMMARY OF THE MAGNITUDE OF EFFECT (DERIVED FROM META-ANALYSES) OF DIFFERENT TYPES OF INTERVENTIONS ON BREASTFEEDING PRACTICES

Review	Intervention	Breastfeeding outcome	Measure of effect	95% CI
Anderson et al (2003) ¹²	Early skin-to-skin contact	Still breastfeeding (any) at 1–3 months post-birth Duration	OR* 2.15 WMD† 41.99 days	(1.10, 4.22) (13.97, 70.00)
USPSTF (2003) ^{13,14}	Breastfeeding education	Initiation	difference‡ 0.23	(0.12, 0.34)
		Short-term duration (< 3 months)	difference 0.39	(0.27, 0.50)
	Support alone	Short-term duration (1–3 months)	difference 0.11	(0.03, 0.19)
		Long-term duration (4–6 months)	difference 0.08	(0.02, 0.16)
Education plus Support	Initiation Short-term duration	difference 0.21 difference 0.37	(0.07, 0.35) (0.17, 0.58)	
Sikorski et al (2001) ¹¹	Support (all types)	Duration	RR (for stopping breastfeeding before last study assessment up to six months) 0.88§	(0.81, 0.95)
		Exclusive breastfeeding	RR (for stopping exclusive breastfeeding before last study assessment) 0.78	(0.60, 0.89)
	Professional support	Duration	RR (for stopping breastfeeding before last study assessment up to 6 months) 0.89	(0.81, 0.97)
		Exclusive breastfeeding	RR (for stopping exclusive breastfeeding before 4–6 wks) 0.50 RR (for stopping exclusive breastfeeding before 2 months) 0.76	(0.27, 0.90) (0.61, 0.94)
	Lay support	Duration	RR (for stopping breastfeeding before last study assessment) 0.84	(0.69, 1.02) non significant trend
		Exclusive breastfeeding	RR (for stopping exclusive breastfeeding before last study assessment) 0.66	(0.49, 0.89)
	Face-to-face interventions	Duration	RR for giving up breastfeeding 0.86	(0.78, 0.94)
	Only Postnatal support	Duration	RR for giving up breastfeeding 0.88	(0.80, 0.96)
	WHO/UNICEF Training	Prolonged exclusive breastfeeding	RR for giving up exclusive breastfeeding 0.70	(0.53, 0.93)
	Donnelly et al (2000) ¹⁰	Commercial hospital discharge packs: With formula promotional material but no formula sample versus no intervention** or non-commercial packs††	Not exclusively breastfeeding at: 0–2 weeks	Peto Odds Ratios** 1.99
3–6 weeks			1.23	(1.05, 1.43)
8–10 weeks			1.73	(1.13, 2.64)
With formula promotional material + formula samples versus no intervention** or non-commercial packs††		0–2 weeks	1.99	(1.04, 3.79)
		3–6 weeks	1.25	(1.06, 1.47)
With formula promotional material but no formula sample versus no intervention††	3–6 weeks	1.27	(1.01, 1.62)	

* OR = Odds Ratio. Mothers that experienced early skin-to-skin contact with their babies were over two times (2.15 times) more likely to be still breastfeeding at 1–3 months than mothers who did not experience early skin-to-skin contact with their babies.

† WMD = Weighted mean difference. A statistical measure of difference used in meta-analysis. In this instance it means that mothers experiencing early skin-to-skin contact breastfed on average 42 days longer than mothers who didn't experience early skin-to-skin contact.

‡ 'difference' refers to the difference in proportion of mothers breastfeeding in the intervention group compared to the control group, i.e. 0.23 indicates that 23% more mothers were breastfeeding as indicated as a result of the intervention

§ Sikorski et al¹¹ present the measure of effect (relative risk) in terms of the risk to the breastfeeding practice, hence it is less than 1. A smaller number indicates a larger, positive effect of the intervention in terms of improved breastfeeding practice.

** The Peto odds ratio is used in Cochrane meta-analyses as an approximation to the odds ratio. For example, mothers were nearly twice (1.73 times) as likely to be exclusively breastfeeding at 8–10 weeks if they did not receive a discharge pack containing formula promotional material

†† No intervention = nothing was given to mothers leaving hospital

‡‡ Non-commercial discharge packs contained an aid to breastfeeding, e.g. a breast pump or breast pads, or contained promotional literature on breastfeeding

analyses identify, appraise and summarise the results of otherwise unmanageable quantities of research. They apply consistent criteria related to study type and aims, and select those studies that are of high quality, valid and provide evidence of effectiveness, to produce findings that can be applied in public health practice. This approach has been applied to the numerous studies evaluating interventions designed to improve breastfeeding practices.

Systematic reviews and meta-analyses of strategies for promoting and supporting breastfeeding published since 1995, when NSW Health last conducted a review of evaluation studies⁹, were identified in the literature. The range of reviews identified were appraised according to the approach recommended in *A Schema for evaluating evidence on public health interventions*.⁸

Nine good quality systematic reviews of breastfeeding interventions were found. Quantitative measures of the effect of particular interventions on breastfeeding outcomes were derived by meta-analysis in four of the reviews.¹⁰⁻¹⁴ The other five reviews¹⁵⁻²⁰ did not provide quantitative measures of effect as it was considered that the primary studies were

too dissimilar in terms of type of intervention(s), participants, and definitions of outcomes.

Evidence of effectiveness

The reviews, and the primary studies to which they relate, varied in terms of the outcome measures assessed; few evaluated effects of programs on duration of breastfeeding, particularly exclusive breastfeeding, beyond three months, and none examined the duration of breastfeeding beyond six months. Most studies, and therefore the reviews, were evaluated for effectiveness in terms of the duration of any breastfeeding, usually over the first few months postpartum.

Much of the available evidence from the systematic reviews relates to educational and support strategies designed to promote mothers' personal skills, and to hospital and health service environments (including particular practices, services, policies and training of health professionals) conducive to breastfeeding. The quantitative evidence from the meta-analyses is provided in Table 2. It shows that the positive effect on breastfeeding is substantial for a number of interventions.

TABLE 3

INTERVENTIONS TO PROMOTE AND SUPPORT BREASTFEEDING: CONCLUSIONS FROM A SYNTHESIS OF FINDINGS OF SYSTEMATIC REVIEWS

Education

- Education alone is effective in increasing rates of breastfeeding initiation and short-term duration
- Content should include: benefits of breastfeeding, principles of lactation, myths, common problems and solutions, and skills training
- Formats most effective are one-to-one educational programs and/or small group programmes in an informal environment together with postnatal home visits
- Sessions spanning prenatal and postnatal periods are most effective

Support

- Increases the longer-term duration and exclusivity of breastfeeding
- Particularly effective in settings where there are high rates of breastfeeding initiation
- Must include face-to-face contact
- Effectiveness is enhanced by home visits
- Peer support increases both rates of breastfeeding initiation (among women who intend to breastfeed) and the duration of exclusive breastfeeding
- Peer support is particularly effective among socioeconomically disadvantaged women
- Peer counsellors are more successful if they are culturally and socially similar to mothers, available to advise on problems and answer questions, and contact is frequent
- Postnatal support alone increases breastfeeding duration

Combination of Education and Support

- Face-to-face education and peer counselling is particularly effective

Health Service Policy and Programs

- Explicit health service policies that outline appropriate health service practices are beneficial
- Specific in-hospital practices that support breastfeeding are: early skin-to-skin contact between the baby and mother, rooming-in, not giving commercial hospital discharge packs, not using supplemental feeds, and not using artificial teats and pacifiers
- A Cochrane review¹¹ indicated that WHO/UNICEF training courses for in-hospital health professionals increased the likelihood of prolonged exclusive breastfeeding by 30%
- The combination of policy, in-hospital practices and professional training is effective in improving breastfeeding practices

Multifaceted interventions

- Multifaceted interventions have been shown to be effective at increasing the initiation and, in most cases, duration of breastfeeding in developed countries
- The optimal mix of interventions will depend on the setting, however packages including two or more of the following have been shown to be effective in improving breastfeeding practices: education of mothers, peer support, changes to hospital practices such as rooming-in and early skin-to-skin contact, staff training, development and implementation of hospital policy, media campaigns/programs, paid maternity leave

Source: *Overview of recent reviews of interventions to promote and support breastfeeding*.⁴

Specific hospital practices such as skin-to-skin contact¹² and not giving commercial discharge packs¹⁰ lead to more women beginning to breastfeed, and increase the length of time that women breastfeed in the short term. For example, early skin-to-skin contact has been shown to increase the length of time mothers breastfeed by 42 days. Other specific hospital practices, such as rooming-in, are also effective.¹⁶

A summary of the major findings synthesised from the nine systematic reviews is presented in Table 3.

Evidence and experience indicates that health service policy and professional training can be important in enabling the consistent and integrated adoption and implementation of recommended practices. Health service policy and health professional training are integral components of the 'Ten steps to successful breastfeeding,'²¹ the Baby Friendly Hospital Initiative,²² and the 'Seven point plan for the protection, promotion and support of breastfeeding in community health settings'.²³

Overall, meta-analyses and narrative systematic reviews indicate that well conducted educational and support interventions have substantial and significant effects on breastfeeding initiation and short-term duration (up to three months). Both peer and professional support strategies have been found to have a significant impact on short-term duration and exclusivity of breastfeeding. Combined educational and support interventions are effective; and a mix of prenatal and postnatal contacts appears to be optimal. Postnatal home visiting appears to be particularly beneficial.

There is some evidence that multifaceted interventions are likely to be effective but the optimal mix of interventions is unknown.

DISCUSSION

The appraisal of systematic reviews identifies educational, support and health service interventions for which the evidence of effectiveness is abundant and convincing. This evidence therefore provides a basis for recommendations to strengthen the implementation of these types of interventions in NSW and Australian health services.

Recent national and international health strategies, such as the National Breastfeeding Strategy²⁴, the Global Strategy for Infant and Young Child Feeding²⁵, and the United States Department of Health and Human Services 'Blueprint for action on breastfeeding'²⁶, advocate the use of a broad range of interventions to promote breastfeeding, including those for which evidence is currently limited, such as workplace initiatives. Similarly, the recent *Dietary Guidelines for Children and Adolescents in Australia* and the *Infant Feeding Guidelines for Health Workers*²⁷ promote a comprehensive approach to breastfeeding promotion and support. Given the numerous and complex influences on breastfeeding, and the range of potential strategies that are not covered

by systematic reviews, a comprehensive policy and set of programs should comprise a broad range of interventions covering individual, group (hospital and health services, home and family, work and community), and societal level determinants.

It is equally important that interventions are evaluated to provide evidence of effectiveness to fill the many evidence gaps that remain.

The report *Overview of recent reviews of interventions to promote and support breastfeeding* is available on the CD that accompanies this special edition of the *NSW Public Health Bulletin*. The report can also be downloaded from www.cphn.biochem.usyd.edu.au/resources/OverviewBreastfeeding.pdf.

Print copies can be obtained from:

NSW Centre for Public Health Nutrition, Medical Foundation Building K25, University of Sydney, NSW 2006.

A copy of the WHO report *Implementing the global strategy for infant and young child feeding* is also available on the CD.

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THE NSW HEALTH BREASTFEEDING PROJECT

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The NSW Health Breastfeeding Project was set up in 2003 as a result of a growing emphasis in government policy on the importance of increasing breastfeeding rates. Encouraging more women to breastfeed their babies and to do so for longer are goals of *Eat well NSW: strategic directions for public health nutrition 2003–2007* and of *The prevention of obesity in children and young people: NSW Government Action Plan 2003–2007*.¹ A commitment to support and promote breastfeeding is also congruent with NSW Health's commitment to equity, as mothers who are young, single, indigenous, living in poorer areas, without post school qualifications or born in countries other than Australia, Oceania, Europe or America are less likely to breastfeed.² In response to these goals, the Nutrition and Physical Activity Branch of NSW Health is leading the NSW Health Breastfeeding Project over three years (2003–2006) and working in close consultation with health sector stakeholders.

The aim of the NSW Health Breastfeeding Project is to contribute to an environment that enables mothers, families and other caregivers to make informed choices about the most appropriate feeding practices for infants. In recognition of the substantial role of the health sector in infant feeding decisions, the project seeks to increase organisational commitment and action within the NSW Health system for the protection, promotion and support of breastfeeding as a public health issue. The project also aims to encourage the application of evidence-based practices to promote and support breastfeeding, and to ensure a focus on breastfeeding services that reach disadvantaged and at-risk groups.³ The project will foster the dissemination of practices, activities and service models shown to be effective, such as the Baby Friendly Hospital Initiative⁴ (described in the article by Heads in this issue).

One of the main activities of the project is to develop an explicit NSW Health breastfeeding policy. The policy will direct action in those areas of health service provision that can positively influence mothers' breastfeeding practices. Other activities will involve professional development and the preparation and dissemination of breastfeeding

resources to support policy implementation.

The NSW Breastfeeding Project Steering Committee, representing stakeholders in the health sector, was established in the initial stage of the project. The committee has refined the scope of the project and will provide advice and recommendations on policy development and implementation. Groups represented include the NSW Midwives Association, NSW Lactation College, Child and Family Health Nurses Association, Australian Lactation Consultants Association, Australian Breastfeeding Association (NSW Branch), Dietitians Association of Australia (NSW Branch), Aboriginal Health and Medical Research Council, NSW Centre for Public Health Nutrition, Pharmacy Guild of Australia (NSW Branch) and the Multicultural Health Communications Service. Branches of the NSW Department of Health and professional networks within NSW Health are also represented. The project coordinator is based at the NSW Centre for Public Health Nutrition.

The second stage of the project involved broad consultation with specialist managers, service providers and professional and community bodies to assess the feasibility of implementing proposed evidence-based practices and interventions. The third stage of the project will involve finalisation of the policy, establishment of baseline data for policy monitoring purposes and active dissemination of the policy and support materials.

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THE BABY FRIENDLY HOSPITAL INITIATIVE: A CASE STUDY FROM NSW

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An important determinant of the initiation of breastfeeding and of its continuation in the first year of an infant's life is the mother's experience in hospital (see 'Factors affecting breastfeeding practices: applying a conceptual framework' by Hector et al in this issue).

In recognition of the importance of the hospital experience in determining future breastfeeding behaviour, the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) developed in 1991 the Baby Friendly Hospital Initiative.

This article introduces the Baby Friendly Hospital Initiative and its introduction to Australia and describes the case study of the Royal Hospital for Women in Sydney, which is accredited as a Baby Friendly hospital.

THE BABY FRIENDLY HOSPITAL INITIATIVE

The Baby Friendly Hospital Initiative aims to give every baby the best start in life by ensuring a health care environment where breastfeeding is endorsed as the norm. Baby Friendly status is accredited to maternity units that pass a rigorous inspection and meet the 'Ten steps to successful breastfeeding' (Table 1). The evidence base for each of these steps was confirmed by a review in 1998 and by

more recent, systematic reviews, meta-analyses and other studies.¹⁻⁶ A number of recent studies endorse the findings that the Baby Friendly Hospital Initiative increases the rates of initiation and duration of breastfeeding. This evidence originates from diverse countries such as Scotland, the United Kingdom, Republic of Belarus, the United States, Switzerland, and Brazil.⁷⁻¹⁶ Paediatric hospitals and community health services are also included in the Baby Friendly Initiative and are required to meet best practice guidelines that are tailored to their functions (Tables 2 and 3).

In order to be accredited, hospitals are required to have written evidence-based breastfeeding policies and staff training programs and to provide comprehensive information to all women booked to deliver their infants at the hospital.¹⁷ A Baby Friendly accredited hospital ensures that practices such as unnecessary separation of mother and baby and inappropriate supplementation with formula do not occur and that, on discharge, information about community support for breastfeeding is given to all mothers.

International experience indicates that Baby Friendly accreditation is a quality tool that enables health authorities, in both developed and developing countries, to monitor and evaluate their efforts to support improved breastfeeding practices through their health facilities.¹⁸⁻²⁰

THE BABY FRIENDLY HOSPITAL INITIATIVE IN AUSTRALIA

Since 1995, the Australian College of Midwives Incorporated has facilitated the initiative in Australia. The college holds corporate governance over the body, Baby Friendly Hospital Initiative in Australia, which is, in turn, supported by state and territory committees and a project officer. In 2002 the college received a two-year grant from the Australian Commonwealth Department of Health and Ageing to support the initiative in Australia.

It is desirable that all hospitals in Australia become Baby Friendly for optimal support of breastfeeding. The most recent data indicates that there are currently 51 hospitals or facilities that are Baby Friendly accredited in Australia, representing approximately 18 per cent of all maternity units (Table 4).

BABY FRIENDLY HOSPITAL INITIATIVE IN NSW

In NSW, there are two maternity units that are currently Baby Friendly accredited (the Royal Hospital for Women and Queanbeyan Hospital). The Royal Hospital for Women was the first tertiary referral teaching hospital in NSW to achieve Baby Friendly status (which occurred in 1999) and is due for its second three-yearly re-accreditation in 2005.

TABLE 1

THE TEN STEPS TO SUCCESSFUL BREASTFEEDING

Every facility providing maternity services and care for newborn infants should:

1. Have a written breastfeeding policy that is routinely communicated to all 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.
4. Help mothers initiate breastfeeding within a half-hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast-milk, unless *medically* indicated.
7. Practice rooming-in – allow mothers and infants to remain together – 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

Source: The Baby Friendly Hospital Initiative (Australia). Available at www.bfhi.org.au/text/bfhi_ten_steps.html. Accessed 15 June 2005.

TABLE 2**BREASTFEEDING IN PAEDIATRIC UNITS
GUIDANCE FOR GOOD PRACTICE**

Breastfeeding is the healthiest way that a woman can feed her baby, because it provides important health benefits to both her and her child. This is why all health care professionals working in the paediatric environment should actively encourage women to breastfeed their babies. The following is a list of measures which paediatric units could adopt to help achieve this aim.

1. Have a written breastfeeding policy that is routinely communicated to all health care staff and provide people with training to acquire the skills necessary to implement this policy.
2. Provide mothers with an environment and facilities which meet their needs for privacy, information and appropriate nutrition.
3. Support mothers in their choice of feeding method – and assist in the establishment and maintenance of breastfeeding.
4. Provide parents with written and verbal information about the benefits of breastfeeding and breastmilk.
5. Use alternative techniques conducive to breastfeeding if a baby is unable to feed at the breast.
6. Give no bottles or dummies to breastfeeding babies unless medically indicated and with parents' permission.
7. Provide facilities that allow mothers and babies to be together 24 hours a day in order to promote breastfeeding on demand.
8. Plan all nursing and medical care to minimise disturbance to the breastfeeding relationship.
9. Provide mothers with a dedicated facility that is appropriately furnished with well-maintained and sterilised equipment for the safe expression and storage of breastmilk.
10. Provide parents with information about breastfeeding support groups during admission and on discharge from hospital.

Source: The UNICEF UK Baby Friendly Initiative. *Breastfeeding in paediatric units—guidance for good practice*. London, Royal College of Nursing.

TABLE 3**THE SEVEN POINT PLAN FOR THE PROTECTION,
PROMOTION AND SUPPORT OF BREASTFEEDING
IN COMMUNITY HEALTH CARE SETTINGS**

All providers of community health care should:

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff
2. Train all staff involved in the care of mothers and babies in the skills necessary to implement the policy
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Support mothers to initiate and maintain breastfeeding
5. Encourage exclusive and continued breastfeeding, with appropriately-timed introduction of complementary foods
6. Provide a welcoming atmosphere for breastfeeding families
7. Promote co-operation between healthcare staff, breastfeeding support groups and the local community

Source: The UNICEF UK Baby Friendly Initiative.

A CASE STUDY

For the Royal Hospital for Women, achieving and maintaining Baby Friendly status is inextricably linked to building a strong breastfeeding culture at the hospital and the regu-

TABLE 4**BABY FRIENDLY HOSPITAL INITIATIVE
ACCREDITED HOSPITALS IN AUSTRALIA, BY
STATE, 21/2/05**

State/ Territory	No. of hospitals	% of maternity units
ACT	2	66.7
NSW	2	4.0
NT	3	50.0
Qld	6	12.7
SA	8	19.5
Tas	4	50.0
Vic	23	20.5
WA	2	3.0
Total	51	17.5

Source: *Baby Friendly Hospital Initiative Australia e-bulletin*. Feb 2005 (4) At www.bfhi.org.au/text/bulletins/21_2_05.htm

lar monitoring of prevailing practices and breastfeeding outcomes. The principles of the Baby Friendly Hospital Initiative place the mother and baby, as an inseparable unit, at the centre of all care. This underpins the hospital's philosophy and mission statement, which is 'Providing care in partnership with women'.

In 1995 the Executive Director and clinicians decided to work towards Baby Friendly accreditation, prior to the hospital's move to the new Randwick site in 1997. Therefore, achieving future Baby Friendly status was considered in the planning and layout of the new postnatal wards. Visitors are still surprised when they do not find a nursery full of babies to 'view' but instead an empty 'arrivals lounge' and babies rooming-in. Wall clocks are no longer in all rooms (to support 'demand feeding') and breastfeeding pictures from many cultures adorn the walls in all areas of the hospital.

The Baby Friendly Hospital Initiative's tenth step encourages maternity facilities to 'foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital'. The hospital has done this by having a small unit on the postnatal ward where women can be seen post-discharge for complex breastfeeding issues. Results of a 2002 sample of 50 women found that 72 per cent of women were breastfeeding at six months.²¹ This is considerably higher than the proportion breastfeeding at six months for the NSW population (42.5 per cent). Considering that these women were referred for complex breastfeeding issues, this suggests that this service is an effective model of postnatal care for maintaining breastfeeding rates.

Attitudinal change among staff continues to prove the greatest challenge to those wishing to seek Baby Friendly accreditation. Much of the educational focus at the Royal Hospital for Women during the preparatory time was to reassure the staff that there would not be a dramatic change in practices. Changes in practice had gradually occurred

over the previous decade with the introduction of evidence-based care.

Working in a Baby Friendly hospital means many things. For example, new staff know in advance the policies, practices and routines that are expected. It means that staff are supported in their on-going breastfeeding education by regular in-service training. It also means financial support for external education from the Royal Hospital for Women's Nursing and Midwifery Education Fund.

At the Royal Hospital for Women, practices affecting breastfeeding outcomes are monitored by random sampling twice a year. These practices include:

- post-birth uninterrupted skin-to-skin contact and timely initiation of first feed
- dummy use
- formula supplementation of breastfeeding babies and assessment of the stated medical reasons
- maternal consent for formula supplementation and dummy use
- early assistance for mothers of pre-term babies with expressing their breast milk.

The Royal Hospital for Women found that implementing the initiative was helped by:

- support from hospital administrators and first line managers
- the hospital Executive's support for the overall initiative
- building and maintaining a breastfeeding culture in the hospital
- training staff to ensure that they understand the initiative and understand that it does not involve a substantial additional workload
- ongoing review of the evidence base for the hospital's routine practices
- development of the Breastfeeding Support Unit, again with the support of hospital administrators and staff
- regular monitoring of current practices and outcomes.

The Royal Hospital for Women has a tradition of striving for the best in health care and consequently Baby Friendly accreditation is viewed as an integral part of our hospital. Comments in support of the Baby Friendly Hospital Initiative are numerous. For example, feedback in the Baby Friendly Hospital Initiative's Assessors report (2002) included 'All mothers interviewed were also very articulate and confident in their breastfeeding knowledge. A number of women commented that they were surprised that they had not received any conflicting advice, as their friends had warned them that this may happen'.²² Such positive comments inspire staff to protect and maintain Royal Hospital for Women's Baby Friendly status.

WHERE TO FROM HERE IN NSW AND AUSTRALIA?

Despite 10 years of experience with the Baby Friendly Hospital Initiative in Australia, its uptake by hospitals remains limited. The reasons for this are complex. Breastfeeding and postnatal care are often not the main focus for many midwives and maternity units, whose central philosophy is quality prenatal care and birthing options. Therefore, the Baby Friendly Initiative remains largely driven by very motivated individuals. Shorter length of hospital stay for newly delivered women mean that women are often discharged before they have learnt the basic skills of newborn feeding and sleeping norms. The Baby Friendly Hospital Initiative is not a high priority activity for area health services and as a result few resources are directed to devising and implementing strategies to improve breastfeeding behaviour. Greater support from policy makers and managers at the state, area health service and institutional levels would help the widespread implementation of the initiative and, ultimately, improve breastfeeding outcomes.

Why are there such large differences in uptake of the initiative across Australia? Differences can be explained by differences in the priorities of local branches of the Australian College of Midwives Incorporated in each state and territory. For hospitals to be appropriately supported to achieve and maintain Baby Friendly Hospital Initiative accreditation their state branch of the Australian College of Midwives Incorporated must see the initiative as part of their core business, in equal concert with antenatal care and birthing options, and must commit resources to the initiative. Endorsement of the initiative is integral to the upcoming NSW breastfeeding policy (as described by Macoun in 'The NSW Health breastfeeding project' in this issue of the *Bulletin*).

Achieving Baby Friendly status in a facility requires a commitment from all staff to ensure that the hospital's culture sees breastfeeding as the normal way of feeding babies and takes into consideration interventions that support or undermine that basic concept.

To increase the number of maternity units achieving Baby Friendly Hospital Initiative accreditation in Australia, we require:

- policy and financial support from national and state health authorities to encourage routine implementation of this evidence-based strategy to increase breastfeeding rates
- the use of 'breastfeeding at discharge' and 'breastfeeding duration' rates, plus the application of the 'ten steps' as benchmarks for achievement by national and state health authorities
- state branches of the Australian College of Midwives Incorporated to see Baby Friendly hospital accreditation

as their core business and to commit further resources to the initiative

- support for services progressing to Baby Friendly hospital to help them identify their specific barriers and to overcome these barriers, and
- dissemination of successful models of Baby Friendly hospitals.

More information can be found at the Australian Baby Friendly Hospital Initiative website: www.bfhi.org.au.

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THE WORLD HEALTH ORGANIZATION CODE OF MARKETING OF BREASTMILK SUBSTITUTES AND SUBSEQUENT RESOLUTIONS (THE WHO CODE)

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This article describes the World Health Organization Code of Marketing of Breastmilk Substitutes and its subsequent resolutions,¹ how Australia is meeting its responsibilities under the Code and how this can contribute to the health of Australian infants.

Commonly known as the WHO Code, the WHO Code of Marketing of Breastmilk Substitutes was adopted in May 1981 by 118 nations. It is auspiced by the WHO and the United Nations Children's Fund (UNICEF). Its focus is the provision of safe and adequate nutrition for infants. Resolution World Health Assembly 34.22 stresses that the adoption and adherence to the Code 'is a minimum requirement and only one of several important actions required in order to protect healthy practices in respect of infant and young child feeding'. In a country such as Australia, however, 'safe and adequate' infant nutrition is not a high enough standard; rather we should aim for 'optimum' infant nutrition.

THE WHO CODE AND ITS SUBSEQUENT RESOLUTIONS

The WHO Code was the first in a series of initiatives by the WHO to improve the health of nations by promoting and protecting breastfeeding. While some regard the focus of the UNICEF/WHO initiatives as developing countries which have high infant mortality, improved health outcomes for newborns (in infancy and throughout life) and benefits for mothers and communities are applicable to all societies. The aim of the WHO Code is to contribute to the provision of safe and adequate nutrition for infants by protecting and promoting breastfeeding, and by ensuring the proper use of breast milk substitutes (when these are necessary) on the basis of adequate information and through appropriate marketing and distribution. The audience for the WHO Code is governments, health care workers and formula manufacturers and distributors.

Australia: an original signatory

Australia was one of the original countries that voted to adopt the WHO Code. The Code is a set of recommendations, but resolution World Health Assembly WHA34.22 urged all member states to give 'full and unanimous support' to the Code, to: 'translate it into national legislation, regulations or other suitable measures' and 'to monitor compliance with the Code'. Australia has largely failed to do this and consequently the Code has no direct authority here.

THE MAIF AGREEMENT

The Marketing in Australia of Infant Formula (MAIF) agreement is a voluntary agreement between the Australian Government and six companies that import and/or manufacturer breastmilk substitutes.² The agreement does not cover infant formula distributors, and the parts of the WHO Code relating to retailers, feeding bottles and teats, health care systems and workers have not been formally implemented. As the agreement is voluntary, signatories to the MAIF agreement are not obliged to comply with the WHO Code.

There are other differences between the MAIF agreement and the WHO Code:

- MAIF covers infant formulas marketed for use in infants up to the age of 12 months. This does not protect the public from exposure to advertisements for toddler formulas carrying the same brand names as infant formulas covered by the agreement. Toddler formulas are not necessary for good nutrition and advertisements for these products exploit parental anxiety about normal 'fussy' toddler intake.
- Article 7.2 of the Code, which restricts information given to health professionals about the products to scientific and factual matters, was strengthened in MAIF to 'information should accurately reflect current knowledge and responsible opinion'. This means that appropriate evidence should be cited in support of claims about a product.

An Advisory Panel on the Marketing in Australia of Infant Formula (APMAIF) of four members—a chair, a community and consumer representative, a public health and infant nutrition expert and an industry representative—receives and investigates complaints about the marketing of infant formula. Most of the complaints received are outside the scope of the MAIF agreement. From July 2002 to June 2004 the panel received 183 complaints, including 138 about retail activity.² Where a breach has been found to have been committed by a signatory to the agreement, the panel has no powers to impose a penalty: it can only recommend remedial steps. Breaches are tabled in Parliament in the APMAIF annual report.

Individuals who observe a violation of the WHO Code are encouraged to make a complaint to APMAIF. Although some of these complaints may be outside the APMAIF terms of reference, each complaint will be documented. Details of how to make a complaint can be found in the latest APMAIF report.²

THE HEALTH PROFESSIONAL AND THE WHO CODE

Although health workers in Australia are not formally covered by the MAIF agreement, the National Health and Medical Research Council has interpreted the WHO Code in the *Dietary Guidelines for Children and Adolescents in Australia*.³ Health professionals, individually and collectively, can make a difference to the well-being of infants and their mothers by implementing the strategies of the WHO Code. Five clauses directly address health care workers:

- 7.1 'Health workers should encourage and protect breastfeeding; and...should make themselves familiar with their responsibilities under this Code, including the information specified in Article 4.2.' (Article 4.2 identifies information that should be given to pregnant women and mothers of infants and young children, sometimes referred to as the 'breastfeeding statement'.)
- 7.2 'Information provided by manufacturers and distributors to health professionals...should be restricted to scientific and factual matters, and such information should not imply or create a belief that bottle-feeding is equivalent or superior to breastfeeding.' This information should also include the 'breastfeeding statement'. Health workers dealing with infants need accurate information to assist mothers who elect not to breastfeed. Obtaining this information is made difficult by the plethora of formula products available and the constant development of new ones. There is a useful catalogue of infant formulas that is periodically updated.⁴ However, a current review article is needed to assist in the selection of infant formula.
- 7.3 'No financial or material inducements to promote products within the scope of this Code should be offered by manufacturers or distributors to health workers or members of their families, nor should these be accepted by health workers or members of their families.' Some promotions are thinly disguised, for example manufacturers sponsoring an expert to speak at a meeting on issues related to their product.
- 7.4 'Samples of infant formula or other products within the scope of this Code, or of equipment or utensils for their preparation or use, should not be provided to health workers except when necessary for the purpose of professional evaluation or research at the institutional level.' What constitutes 'professional evaluation'? This is a contentious area and open to manipulation by formula companies. Currently, formula samples are being given to doctors and carers, under this clause, but such ad hoc 'evaluation' of products does not accord with good clinical

practice. Does evaluation include giving a sample to the carer to see if it suits the baby? The WHO Code Article 7.4 contains a second sentence: 'Health Workers should not give samples of infant formula to pregnant women, mothers of infants and young children, or members of their families.' This accords with good clinical practice.

- 7.5 'Manufacturers and distributors of products...should disclose to the institution to which a recipient health worker is affiliated any contribution made to him or on his behalf for fellowships, study tours, research grants, attendance at professional conferences, or the like. Similar disclosures should be made by the recipient.'

The WHO Code covers clauses relating to 'health care systems' as well as health workers. For instance, where infants under one year of age do not receive human milk, feeding with a correctly prepared, commercial infant formula is appropriate. This preparation 'should be demonstrated only by health workers, or other community workers if necessary; and only to the mothers or family members who need to use it; and the information given should include a clear explanation of the hazards of improper use' (clause 6.5).

One of Australia's strengths in promoting and protecting breastfeeding is the work carried out by the Australian Breastfeeding Association and by health professionals, especially those who are members of lactation associations and colleges. Much has been achieved in the 23 years since the WHO Code first appeared. However, the high percentage of mothers who stop breastfeeding their baby in the first six months of his or her life illustrates that much remain to be achieved. Acknowledging our national responsibilities under The WHO Code would be a significant contribution to this.

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COMMUNICABLE DISEASES REPORT, NSW, FOR JANUARY AND FEBRUARY 2005

For updated information, visit www.health.nsw.gov.au and click on Infectious Diseases.

TRENDS

Tables 2 and 3 and Figure 1 show reports of communicable diseases received through to the end of February 2005 in NSW. Notably, relatively few cases of Ross River virus and Barmah Forest virus infections were reported over the summer, but the usual summer increase in cryptosporidiosis cases did appear. Twenty-five cases of meningococcal disease were reported in the first two months of 2005 (12 in January and 13 in February). Of these, 14 were reported to be due to serogroup B infection and five to serogroup C infection. Two individuals died; both cases had been reported in January.

Enteric disease

An increase in infections due to *Salmonella enterica* subspecies enterica serovar Typhimurium phage type 170 (STM170) over the summer period was identified in NSW with 198 cases reported from mid-October to the end of February. This included 60 cases in February. STM170 was the most commonly reported *Salmonella* serotype in NSW in 2003 (n=240) and 2004 (n=348). For the last quarter of 2004 there was a 74 per cent increase in the number of cases reported compared to the same period in 2003. STM170 accounted for 47% of all *S. Typhimurium* notifications in the period from October 2004 to February 2005.

NSW Health's public health units, the Communicable Diseases Branch and the NSW Food Authority investigated this increase. This involved a review of the literature for similar outbreaks, a review of past laboratory reports of non-human isolates of STM170 bacteria, extensive interviews with cases about all foods eaten and other exposures in the three days before onset of illness, and an assessment of food handling procedures by selected food retailers. Despite these measures a source of the infection could not be established. A statewide case-control study comparing dietary risk factors of the cases with those of a group of randomly selected controls is underway.

In February, an increase in infections due to *Salmonella* Typhimurium phage type 197 was identified. Fifteen cases were reported. Case interviews conducted by three public health units found that the majority of the patients were born in Lebanon and/or were Arabic speaking. Detailed interviews with the cases are continuing in an attempt to identify a common source of infection.

Legionnaires' disease outbreak in Wollongong

The South Eastern Sydney/Illawarra Public Health Unit reported a Legionnaires' disease outbreak in Wollongong in February. The first case, a man in his 70s, was notified to

the local public health unit by a diagnostic laboratory on 10 January. On interview the patient reported headaches and fever starting on 31 December 2004. He reported frequent visits to the Wollongong central business district in the two to 10 days before the onset of his symptoms.

Legionnaires' disease is a bacterial infection characterised by symptoms of malaise, muscle aches and anorexia, followed by fever, chills, dry cough and pneumonia. Gastrointestinal symptoms may occur. The case fatality rate is up to 39 per cent of hospitalised patients, and may be higher among people with underlying diseases. Known risk factors include male gender, smoking, increasing age, immune suppression and chronic diseases.¹

Legionella pneumophila bacteria can thrive in certain aqueous environments, such as untreated air conditioning cooling towers, hot water systems and decorative fountains. Legionnaires' disease is transmitted from these environments when people breathe in contaminated aerosols. Person-to-person transmission has not been reported. The incubation period is between two and 10 days.¹

A large outbreak of legionnaires' disease occurred in Wollongong in 1987, when at least 44 cases and nine deaths were identified.² As a consequence, the current outbreak caused understandable community concern.

The public health unit notified the local council that a case had been reported with a potential epidemiological link to the city centre and as a precaution the council brought forward its routine cooling tower inspection and sampling program. Subsequently a second case, a man in his 30s, was notified on the 27 January. He had become ill on 30 December. The man reported also visiting the city centre during the incubation period. The public health unit sent an alert to general practitioners, emergency departments and diagnostic laboratories in the area, informing them of the two cases, asking them to consider the diagnosis of Legionnaires' disease in patients with pneumonia, and to collect urine samples for *Legionella* antigen testing, sera for antibody testing and sputum samples for bacterial examination. A media release was issued to alert the public and other professionals were informed.

The council inspections and testing identified the presence of *Legionella pneumophila* serogroup 1 bacteria in the cooling towers of three buildings in the central business district. These towers were cleaned and disinfected by 11 February. As a precaution, building owners voluntarily arranged for the remaining cooling towers in the city centre to be cleaned at about the same time.

A second alert was sent out to local general practitioners, emergency departments and diagnostic laboratories on 10

February and daily media statements were initiated. The public health unit established an 1800 hotline to keep the public and health workers informed and to identify further concerns.

By mid-March, a total of 14 cases of Legionnaires' disease had been reported. Of these, 12 were initially diagnosed by detection of urinary antigen and two by a fourfold rise in antibody titres to *Legionella pneumophila* serogroup 1. Nine people were hospitalised. There were no fatalities. Indeed, a notable factor in this outbreak was the mild nature of the symptoms. The area public health unit, assisted by two members of the NSW Public Health Officer Training Program, interviewed every patient in person, using a detailed questionnaire developed for the outbreak, and mapped their movements for each of the 10 days before they became ill. The people affected were aged from 18 to 88 years, and 86% were male. Mapping of their movements revealed the Wollongong city centre as the only common exposure for all cases. However, three people reported only limited links to the city centre.

This outbreak highlights the importance for building owners to ensure that any cooling towers are well maintained through regular inspection and disinfection. For guidance on control measures see: www.health.nsw.gov.au/pubs/2004/pdf/legionnaires_disease.pdf.

References

1. Heymann DL, editor. *Control of communicable diseases manual*. 18th ed. Washington, DC: American Public Health Association, 2004: 292–5
2. Christopher PJ, Noonan LM, Chiew R. Epidemic of legionnaires' disease in Wollongong. *Med J Aust* 1987; 147: 127–8.

QUARTERLY REPORT: AUSTRALIAN CHILDHOOD IMMUNISATION REGISTER

Table 1 compares the percentages of fully immunised indigenous and non-indigenous children in New South Wales aged 12 months to less than 15 months in each area health service, reported by all service providers. The data for indigenous children are reported for the first time.

These data refer to children whose age has been calculated 90 days before data extraction. The information in the report has been extracted from the Australian Childhood Immunisation Register and may be underestimated by approximately three per cent, due to children being vaccinated late or to service providers failing to forward information to the register. ☒

TABLE 1

PERCENTAGE OF INDIGENOUS AND NON-INDIGENOUS CHILDREN IN NSW AGED 12 MONTHS TO LESS THAN 15 MONTHS WHO ARE FULLY IMMUNISED

Area Health Service	31/03/2005	31/03/2005
	Non-indigenous	Indigenous
Great Southern	93	91
Great Western	92	87
Hunter / New England	93	87
North Coast	86	84
Northern Sydney / Central Coast	90	100
South Eastern Sydney / Illawarra	90	88
South Western Sydney	90	91
Western Sydney	91	85
NSW	91	89
AUSTRALIA	91	86

FIGURE 1

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JAN 1999 TO FEB 2005, BY MONTH OF ONSET

Preliminary data: case counts in recent months may increase because of reporting delays.
 Laboratory-confirmed cases only, except for measles, meningococcal disease and pertussis
 BFV = Barmah Forest virus infections,
 RRV = Ross River virus infections
 lab+ = laboratory confirmed

Men Gp C and Gp B = meningococcal disease due to serogroup C and serogroup B infection, other/unk = other or unknown serogroups.
 NB: multiple series in graphs are stacked, except gastroenteritis outbreaks.
 NB: Outbreaks are more likely to be reported by nursing homes and hospitals than from other institutions

NSW population	
Male	50%
<5	7%
5-24	28%
25-64	52%
65+	13%
Rural*	42%

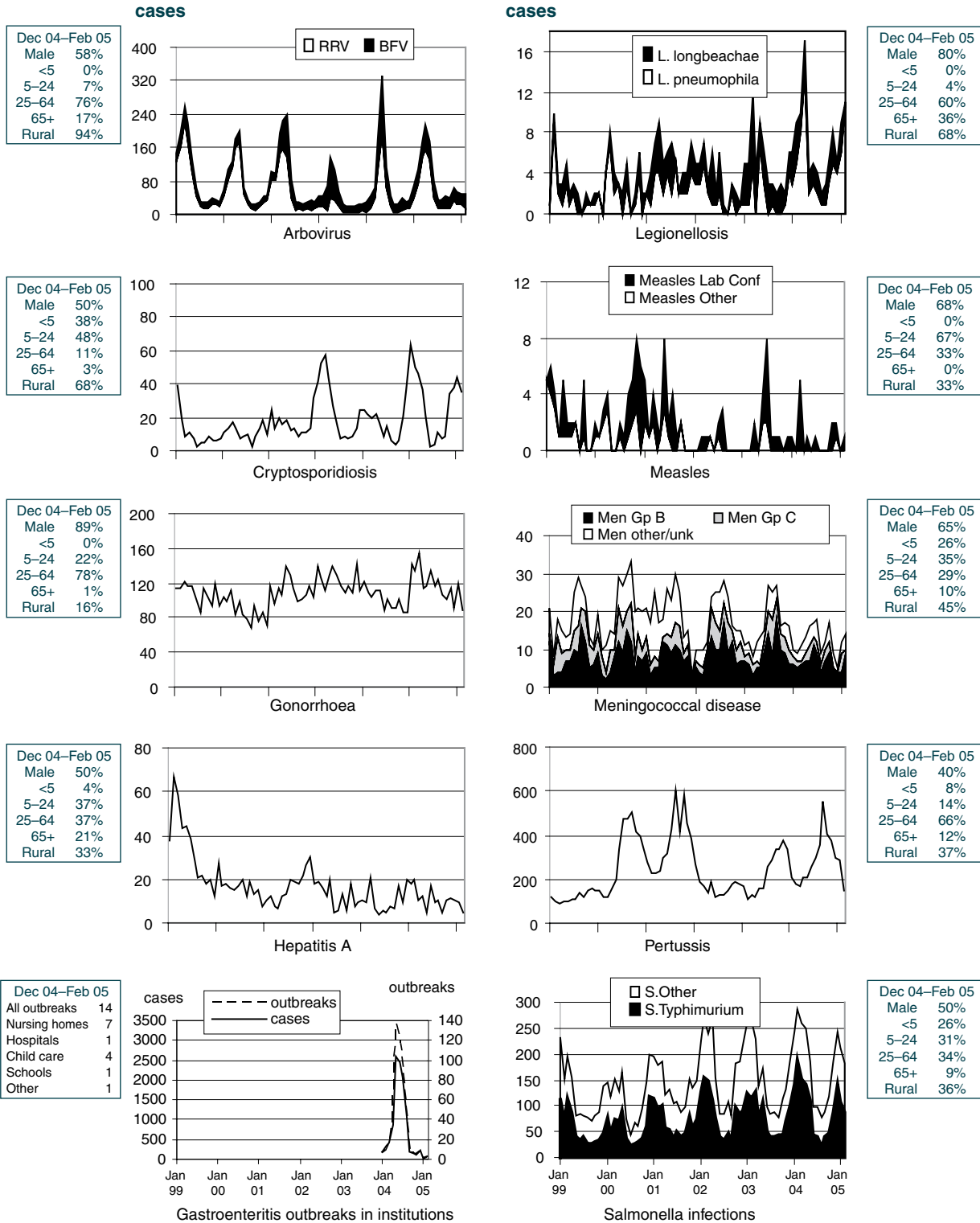


TABLE 2 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN JANUARY 2005 BY AREA HEALTH SERVICES

Condition	Area Health Service (2005)														Total for Jan [†]	To date [†]			
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA			FWA	GMA	SA
Blood-borne and sexually transmitted																			
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	78	93	78	10	72	30	85	32	154	43	32	32	6	18	-	17	15	6	813
Gonorrhoea*	24	13	5	1	2	1	8	3	31	7	3	2	3	-	-	1	-	-	105
Hepatitis B—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis B—other*	43	34	46	5	76	3	8	5	30	4	3	3	-	4	-	3	4	-	272
Hepatitis C—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis C—other*	37	25	31	17	58	25	28	17	60	14	19	3	4	10	-	10	15	22	399
Hepatitis D—unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syphilis	18	7	6	-	10	1	1	-	16	2	1	-	-	2	-	-	-	1	65
Vector-borne																			
Barmah Forest virus*	-	-	-	-	-	-	3	1	-	13	12	1	-	-	1	1	-	-	32
Ross River virus*	-	1	-	1	1	1	3	-	-	4	8	7	-	2	-	-	2	-	29
Arboviral infection (other)*	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2
Malaria*	3	-	1	-	2	-	1	-	1	-	-	-	-	-	-	1	-	-	9
Zoonoses																			
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptospirosis*	-	-	-	-	-	-	-	-	-	2	-	2	-	1	-	-	-	-	6
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	1	-	1	-	-	3	1	-	-	-	3	-	-	-	3	-	-	12
Q fever*	-	-	-	-	-	-	5	-	-	-	-	8	2	-	-	-	-	-	15
Respiratory and other																			
Blood lead level [†]	2	-	-	1	3	-	1	-	-	-	-	-	-	-	-	-	1	-	8
Influenza*	6	16	2	8	2	2	3	3	43	1	-	-	13	2	-	-	2	-	98
Invasive pneumococcal infection*	5	9	4	2	3	2	9	3	3	1	3	-	3	-	-	1	1	-	49
Legionella longbeachae infection*	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Legionella pneumophila infection*	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	1	-	-	4
Legionnaires' disease (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meningococcal infection (invasive)*	2	1	1	-	1	2	2	1	-	-	-	-	1	-	-	-	-	-	10
Tuberculosis	11	6	6	-	5	1	-	1	2	-	-	-	-	-	-	-	-	-	33
Vaccine-preventable																			
Adverse event after immunisation**	-	-	-	-	1	2	-	-	-	-	-	-	-	-	-	-	-	-	3
H. Influenzae b infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Measles	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Mumps*	1	7	1	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	11
Pertussis	27	43	36	20	27	12	16	8	54	9	21	7	27	4	-	8	3	-	322
Rubella*	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enteric																			
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	1	1	3	1	2	1	6	1	3	4	3	5	-	1	-	6	-	-	38
Giardiasis*	7	23	9	1	3	5	11	7	14	2	-	3	2	1	-	2	1	-	91
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
HepatitisA*	-	-	1	1	3	-	-	-	1	2	-	2	1	1	-	1	-	-	12
HepatitisE*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Listeriosis*	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1
Salmonellosis*	20	22	22	10	32	11	15	5	28	22	9	8	-	3	-	15	4	-	227
Shigellosis*	-	1	-	-	1	-	-	-	2	3	-	-	1	-	-	-	-	-	8
Typhoid and paratyphoid*	1	1	1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Verotoxin producing E. coli*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Miscellaneous																			
Creutzfeldt-Jakob disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meningococcal conjunctivitis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* lab-confirmed cases only
[†] includes cases with unknown postcode
 ** HIV and AIDS data are reported separately in the Public Health Bulletin quarterly
 AEFIs notified by the school vaccination teams during the National Meningococcal C Program are not included in these figures. These notifications are reviewed regularly by a panel of experts and the results will be published quarterly in the Public Health Bulletin in 2004

CSA = Central Sydney Area	WEN = Wentworth Area	HUN = Hunter Area	NRA = Northern Rivers Area	MAC = Macquarie Area	GMA = Greater Murray Area
NSA = Northern Sydney Area	SWS = South Western Sydney Area	ILL = Illawarra Area	MNC = North Coast Area	MWA = Mid Western Area	SA = Southern Area
WSA = Western Sydney Area	CCA = Central Coast Area	SES = South Eastern Sydney Area	NEA = New England Area	FWA = Far West Area	CHS = Corrections Health Service

TABLE 3 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN FEBRUARY 2005 BY AREA HEALTH SERVICES

Condition	Area Health Service (2005)														Total for Feb [†]	To date [†]					
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA			FWA	GMA	SA	CHS	
Blood-borne and sexually transmitted																					
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Chlamydia (genital)*	115	96	89	17	69	39	74	51	210	36	22	23	6	28	6	29	24	5	948	1772	
Gonorrhoea*	29	10	13	2	9	1	5	2	48	4	-	-	1	-	-	-	2	1	128	2033	
Hepatitis B—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis B—other*	51	27	47	8	37	5	1	7	39	4	1	4	2	1	-	2	2	1	240	514	
Hepatitis C—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hepatitis C—other*	56	21	32	26	40	37	28	36	38	32	24	14	4	13	-	5	9	19	443	853	
Hepatitis D—unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Syphilis	19	9	11	-	16	-	-	-	22	3	1	1	2	1	-	1	-	-	86	151	
Vector-borne																					
Barmah Forest virus*	-	-	-	-	-	-	4	1	-	10	15	3	-	-	-	-	2	-	35	66	
Ross River virus*	-	-	-	1	1	1	-	-	4	4	1	1	2	1	1	2	-	-	17	45	
Arboviral infection (other)*	2	-	-	-	-	-	-	-	1	-	-	4	-	-	-	-	1	-	6	6	
Malaria*	-	1	-	-	-	-	4	-	2	2	-	-	-	-	-	-	-	-	9	18	
Zoonoses																					
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leptospirosis*	-	-	-	-	-	-	-	-	-	1	1	1	-	-	-	1	-	-	4	10	
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	1	-	-	4	16	
Q fever*	-	-	-	-	-	-	2	-	-	-	3	2	-	-	-	-	-	-	7	22	
Respiratory and other																					
Blood lead level†	1	1	-	1	1	1	5	-	-	1	1	-	-	-	-	-	-	-	10	18	
Influenza*	3	5	23	1	23	1	4	4	48	-	-	-	7	-	-	5	-	-	121	219	
Invasive pneumococcal infection*	4	3	2	1	3	-	6	3	-	3	1	1	-	-	-	1	2	-	30	81	
<i>Legionella longbeachae</i> infection*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	
<i>Legionella pneumophila</i> infection*	1	-	2	-	-	-	10	-	-	-	-	-	-	-	-	-	-	-	15	18	
Legionnaires' disease (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Meningococcal infection (invasive)*	1	-	6	1	2	1	1	-	10	-	-	1	-	1	-	1	-	-	16	26	
Tuberculosis	3	-	10	-	3	1	2	2	1	3	-	-	-	-	-	-	-	-	35	69	
Vaccine-preventable																					
Adverse event after immunisation**	-	1	1	-	-	-	1	-	1	-	-	2	-	-	-	-	-	-	6	9	
<i>H. Influenzae b</i> infection (invasive)*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	
Measles	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	2	
Mumps*	2	6	1	-	4	-	1	-	2	-	-	1	-	-	-	-	-	-	17	28	
Pertussis	20	37	49	20	23	10	36	12	47	13	6	4	5	5	-	3	1	1	292	614	
Rubella*	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	2	3	
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Enteric																					
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Cryptosporidiosis*	-	-	6	2	1	-	6	5	7	8	3	3	2	3	-	3	-	-	49	87	
Giardiasis*	13	24	16	6	8	6	12	7	21	3	4	3	2	4	-	4	2	-	136	229	
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	-	2	3	
HepatitisA*	1	1	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5	17	
HepatitisE*	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	4	
Listeriosis*	-	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	1	-	4	5	
Salmonellosis*	30	31	27	14	24	14	13	5	41	22	6	5	1	6	1	2	1	-	245	473	
Shigellosis*	2	1	-	-	-	-	1	1	3	4	1	1	1	-	-	-	-	-	14	22	
Typhoid and paratyphoid†	3	-	-	-	1	1	-	-	2	1	-	-	-	-	-	-	-	-	8	12	
Verotoxin producing <i>E. coli</i> *	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Miscellaneous																					
Creutzfeldt-Jakob disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Meningococcal conjunctivitis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

* lab-confirmed cases only † includes cases with unknown postcode ** HIV and AIDS data are reported separately in the Public Health Bulletin quarterly
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NSW PUBLIC HEALTH BULLETIN

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A *Bulletin* article should be about 1500 words, not including tables and figures. News, comments and other reports should be 500–600 words. All articles should include a short introductory abstract that reflects the structure of the paper. References should be set out in Vancouver style (see www.nlm.nih.gov/bsd/uniform_requirements.html). Send submitted manuscripts on paper and in electronic form, either on disc (preferably Word for Windows) or by email. The paper copy must be accompanied by a letter signed by all the authors. Full instructions for authors are available on request from the editorial office.

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NSW HEALTH

A CD TO SUPPORT BREASTFEEDING AND THE PUBLIC'S HEALTH

A CD has been produced to accompany this issue of the *NSW Public Health Bulletin* and this is attached below. The CD collates seven reports that are central references for this issue. In order to provide a complete reference resource for practitioners, this issue of the *Bulletin* is also reproduced on the CD.

CONTENTS

The CD contains the following documents in order of presentation:

- Copyright permission statement
- *NSW Public Health Bulletin*, 16: 3–4
- *Overview of recent interventions to promote and support breastfeeding*
- *Report on breastfeeding in NSW*
- *International code of marketing of breast-milk substitutes*
- *Implementing the global strategy for infant and young child feeding*
- *Nutrient adequacy of exclusive breastfeeding for the term infant during the first six months of life*
- *Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps*
- *Dietary guidelines for children and adolescents in Australia – incorporating the infant feeding guidelines for health workers*

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