

The health and economic benefits of breastfeeding

Overview

- 3.1 Over the last few decades, a growing number of scientific studies have shed light on the extensive health benefits of breastfeeding for both babies and mothers. These benefits are diverse, relating to the physiological, nutritional and cognitive aspects of infant development as well as maternal well-being.
- 3.2 The first part of this chapter examines the health benefits of breastfeeding for babies and mothers. These health benefits are immediate and also persist until later in life. The chapter will also focus on the unique properties of human breast milk and the valuable role of milk banks. Breastfeeding is also examined from an economic perspective, with an analysis of the short and long-term impacts on Australia's health system.
- 3.3 Breast milk is also an environmentally friendly product. Many consumables are needed for the packaging of infant formula and the production of bottles and teats. This requires significant resources and poses the problem of waste disposal for some of these items. Although breastfeeding is environment friendly it is often overlooked in environmental programs.

Health benefits for the baby

- 3.4 There is solid evidence for the protective effects of breastfeeding against three classes of infectious disease in babies: gastrointestinal illnesses, respiratory tract infections, and otitis media (middle ear infections).
- 3.5 Studies suggest that the longer a baby is breastfed, the greater the protective effect against infections (known as a 'dose-response' effect). Exclusive breastfeeding appears to confer a greater protective effect against gastrointestinal and respiratory illnesses, while partial or minimal breastfeeding is not as protective.¹ Even an extra two months of breastfeeding can make a difference. A recent study showed that babies exclusively breastfed for four to six months only were four times more likely to suffer from pneumonia and twice as likely to suffer recurrent ear infections than those breastfed for six months or longer.²
- 3.6 A landmark study in breastfeeding research was the Promotion of Breastfeeding Intervention Trial (PROBIT) in the Republic of Belarus, which examined more than 17,000 mother and baby pairs. The findings showed that exclusive breastfeeding in the first year of life decreased the risk of gastrointestinal tract infections by 40 per cent.³
- 3.7 Babies who are not breastfed have a significantly increased risk of developing middle ear infections.⁴ Breastfeeding also protects against recurrent otitis media, which can eventually result in hearing loss in children. Again, the shorter the duration of breastfeeding, the greater the risks of contracting these infections. It is worth noting that the rates of recurrent otitis media are also ten times worse in Indigenous children than in the general population (see chapter 7).

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- 1 Raisler J et al, 'Breastfeeding and infant illness: a dose-response relationship?', *American Journal of Public Health* (1999), vol 89, no 1, pp 25-30.
- 2 Chantry C et al, 'Full breastfeeding duration and associated decrease in respiratory tract infection in US children', *Pediatrics* (2006), vol 117, no 2, pp 425-432; NSW Centre for Public Health Nutrition, sub 178, p 6; Australian Breastfeeding Association, sub 306, p 14.
- 3 Kramer M et al, 'Promotion of breastfeeding intervention trial (PROBIT) - a randomised trial in the Republic of Belarus', *Journal of the American Medical Association* (2001), vol 285, no 4, pp 413-420.
- 4 Heinig M and Dewey K, 'Health advantages of breastfeeding for infants: a critical review', *Nutrition Research Reviews* (1996), vol 9, p 97; Duffy L et al, 'Exclusive breastfeeding protects against bacterial colonisation and day care exposure to otitis media', *Pediatrics* (1997), vol 100, no 4, p e7; Australian Breastfeeding Association, sub 306, p 10.

- 3.8 The incidence of asthma and allergies may also be reduced by breastfeeding for longer. Dr Wendy Oddy and colleagues from the Telethon Institute for Child Health Research conducted the Western Australian Pregnancy Cohort Study, which followed 2187 children to six years of age. They found that a significant reduction in the risk of childhood asthma at the age of six years occurs if exclusive breastfeeding is continued for at least four months after birth. While the exact reasons are still unknown, protection against allergies may be because breastfed babies are less exposed to foreign dietary antigens (e.g. from cow's milk). The special properties of breast milk may also promote a more effective immune system.⁵ The extent to which breastfeeding can protect against asthma and allergies is still to be determined, with a recent Australian study at the Children's Hospital at Westmead, finding that longer duration of breastfeeding did not prevent the onset of these conditions by the age of five years.⁶
- 3.9 Some studies suggest that breastfeeding could also have a positive effect on a child's neurodevelopment. However, the links between breastfeeding and increased cognitive ability and intelligence are subject to debate. It is difficult to attribute greater intelligence to breastfeeding alone, when environmental factors could also have an influence.⁷ For example, a recent study examined the effect of breastfeeding on the IQ of preschool children. Results showed that neither the mode of feeding (breastfed or formula fed) nor the duration of breastfeeding were related to the IQ of children at four years of age when the quality of the home environment and socio-economic status of families were taken into account.⁸
- 3.10 Breastfeeding may help to prevent a number of other conditions including some childhood leukaemias, urinary tract infections, inflammatory bowel disease, coeliac disease and sudden infant death
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5 Oddy W, Telethon Institute for Child Health Research, sub 216, pp 19-25; Oddy W et al, 'Association between breastfeeding and asthma in 6 year old children: findings of a prospective birth cohort study', *British Medical Journal* (1999), vol 319, pp 815-819.

6 Mhrshahi S et al, 'The association between infant feeding practices and subsequent atopy among children with a family history of asthma', *Clinical and Experimental Allergy* (2007), vol 37, no 5, pp 671-679.

7 Allen J and Hector D, 'Benefits of Breastfeeding', *NSW Public Health Bulletin* (2005), vol 16, p 43; Der G et al, 'Effect of breastfeeding on intelligence in children: prospective study, sibling pairs analysis, and meta-analysis', *British Medical Journal* (2006), vol 333, pp 945-948; Jain A et al, 'How good is the evidence linking breastfeeding and intelligence?', *Pediatrics* (2002), vol 109, pp 1044-1053; Mortensen E et al, 'The association between duration of breastfeeding and adult intelligence', *Journal of the American Medical Association* (2002), vol 287, no 18, pp 2365-2371; Allen J, sub 316.

8 Zhou S, Makrides M and Gibson R, sub 270, p 1.

syndrome (SIDS). There is also evidence of possible associations between breastfeeding and lower rates of dental occlusion⁹, bacteraemia, meningitis and type 1 diabetes.¹⁰ Further research is required to determine the significance of these associations.

- 3.11 The fact that breastfeeding provides important health benefits for both mothers and babies is demonstrated in the consistency of results from a growing body of breastfeeding research. However, most breastfeeding studies are observational as it is considered unethical to conduct controlled infant feeding experiments. Therefore, it is important to note that there are limitations to breastfeeding research methods.¹¹

Obesity, early nutrition and chronic disease risk

- 3.12 There is growing interest amongst public health researchers in exploring the links between early nutrition and chronic disease risk in childhood and into adulthood.¹² Given that obesity has become a serious health problem in Australia, the association between breastfeeding and weight gain is of particular interest to the committee.
- 3.13 Strong evidence is accumulating to show that children are less likely to be overweight or obese if they have been breastfed as babies.¹³ Babies who are breastfed for at least three months have a lower rate of obesity during childhood, with the protective effect increasing if

9 Brown L, sub 121, pp 1-2.

10 Allen J and Hector D, 'Benefits of Breastfeeding', *NSW Public Health Bulletin* (2005), vol 16, p 44; Heinig M and Dewey K, 'Health advantages of breastfeeding for infants', pp 89-110; National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 6.

11 Smith J, Harvey P, Australian Centre for Economic Research on Health, sub 319, p 11; Allen J and Hector D, 'Benefits of Breastfeeding', *NSW Public Health Bulletin* (2005), vol 16, p 42.

12 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 5.

13 Oddy W, Telethon Institute for Child Health Research, sub 216, pp 5-15; Harder T et al, 'Duration of breastfeeding and risk of overweight', *American Journal of Epidemiology* (2005), vol 162, no 5, pp 397-403; Grummer-Strawn L and Mei Z, 'Does breastfeeding protect against pediatric overweight? Analysis of longitudinal data from the Centers for Disease Control and Prevention Pediatric Nutrition Surveillance System', *Pediatrics* (2004), vol 113, no 2, pp e81-86.

breastfeeding continues until six months. This protective effect may also extend into adulthood.¹⁴

- 3.14 Professor Colin Binns of the School of Public Health at Curtin University has emphasised the importance of the association between breastfeeding and obesity. He argues that evidence of this single health impact is more than sufficient justification to implement a major public health promotion campaign for breastfeeding.¹⁵
- 3.15 There are several ways in which breastfeeding may lower the risk obesity. One hypothesis is that breastfed babies grow at a slower rate. Putting on weight too quickly may reduce the likelihood of growing into a leaner body shape.¹⁶ The Perth Infant Feeding Study Mark II found a positive association between weight gain at one year of age and early and regular consumption of formula.¹⁷
- 3.16 Satiety, or the feeling of fullness, could be another key to explaining the breastfeeding and obesity relationship. Breastfeeding babies know when they have consumed enough. The practice of encouraging formula-fed babies to finish all of the milk in a bottle could make them less responsive to natural hunger cues and feelings of fullness as they move onto solids later in life.¹⁸ Conversely, breastfeeding may help to program and regulate appetite at an early age.¹⁹
- 3.17 Evidence also suggests that breastfeeding protects against a range of chronic illnesses which can develop in adulthood, including type 2 diabetes, heart disease, atherosclerosis, and high blood pressure.²⁰
- 3.18 Breastfeeding can provide optimal nutrition from birth, and confers health advantages that persist until later in life. As seen later in the chapter, these long-term health benefits can also have more pronounced effects at the population level, with broader implications for economically sustainable health care.

14 Binns C, transcript, 26 March 2007, pp 14-15.

15 Binns C, sub 86, pp 2-3.

16 Binns C, sub 86, p 3.

17 Oddy W, Telethon Institute for Child Health Research, sub 216, p 12.

18 Hector D, NSW Centre for Public Health Nutrition, transcript, 4 June 2007, p 43.

19 Binns C, sub 86, p 3.

20 Allen J and Hector D, 'Benefits of Breastfeeding', *NSW Public Health Bulletin* (2005), vol 16, pp 43-44; Oddy W, Telethon Institute for Child Health Research, sub 216, pp 5-6.

Health benefits for the mother

- 3.19 Convincing evidence exists for breastfeeding's positive impact on maternal health. It is beneficial in promoting the mother's recovery from childbirth; ensuring the delayed return of menstruation and fertility; and significantly reducing the risk of pre-menopausal breast cancer. Breastfeeding promotes a more rapid return of the uterus to its pre-pregnant state. It stimulates the release of the hormone oxytocin, stimulating uterine contractions and minimising the risk of haemorrhage.²¹
- 3.20 Breastfeeding also contributes to a longer period of infertility after birth, leading to increased spacing between pregnancies. However, the extent of both the maternal recovery process and suppressed fertility also depends on the duration, intensity and frequency of breastfeeding.²²
- 3.21 The protective effect of breastfeeding against pre-menopausal breast cancer has been shown in a number of studies. Protection against post-menopausal breast cancer is also probable.²³ A recent review of 47 studies throughout 30 countries indicated that for every 12 months of breastfeeding, the risk of breast cancer decreases by 4.3 per cent.²⁴
- 3.22 A number of other possible health benefits for mothers include:
- accelerated weight loss and return to a pre-pregnancy body weight;²⁵
 - reduced risk of ovarian and endometrial cancers;²⁶

21 Heinig M and Dewey K, 'Health effects of breastfeeding for mothers: a critical review', *Nutrition Research Reviews* (1997), vol 10, pp 35-56; NHMRC, *Dietary Guidelines*, p 5; Hensby J, sub 269, pp 15-16.

22 Allen J and Hector D, 'Benefits of Breastfeeding', *NSW Public Health Bulletin* (2005), vol 16, p 43; Heinig M and Dewey K, 'Health effects of breastfeeding for mothers', *NSW Public Health Bulletin* (2005), vol 16, pp 41-42.

23 Bernier M et al, 'Breastfeeding and risk of breast cancer: a meta-analysis of published studies', *Human Reproduction Update* (2000), vol 6, no 4, pp 374-386; Lipworth L et al, 'History of breastfeeding in relation to breast cancer risk: a review of the epidemiologic literature', *Journal of the National Cancer Institute* (2000), vol 19, no 4, pp 302-312; Heinig M and Dewey K, 'Health effects of breastfeeding for mothers', p 43.

24 Beral V, 'Breastfeeding: collaborative reanalysis of individual data for 47 epidemiological studies in 30 countries, including 50,302 women with breast cancer and 96,973 women without the disease', *The Lancet* (2002), vol 360, pp 187-195; Dyson T, sub 32, pp1-2.

25 Heinig M and Dewey K, 'Health effects of breastfeeding for mothers', pp 38-41.

26 Tung K et al, 'Reproductive factors and epithelial ovarian cancer risk by histologic type: a multiethnic case-control study', *American Journal of Epidemiology* (2003), vol 158, no 7, pp

- improved bone mineralisation, leading to decreased risk of osteoporosis;²⁷
 - protection against rheumatoid arthritis;²⁸ and
 - protection against type 2 diabetes.²⁹
- 3.23 Given that Australian women are having babies later in life, when they are at a higher risk for obstetric complications, the promotion of the health benefits of breastfeeding for mothers is all the more crucial as public health strategy.³⁰

Emotional benefits to the mother and baby

- 3.24 The emotional closeness generated by breastfeeding benefits both the mother and the baby. It is a pleasurable and positive skin-to-skin interaction. The hormones oxytocin and prolactin are stimulated, reducing maternal stress and fostering emotional bonding.³¹
- 3.25 Some studies have shown that breastfeeding can prevent or limit the duration of post-natal depression in mothers.³² Others have suggested a link between breastfeeding and child and adolescent mental health. For example, Dr Oddy has found an association between breastfeeding for six months or longer and a reduction in mental health problems throughout childhood and adolescence. However, evidence in this field is still limited, given the environmental factors that need to be taken into account.³³

629-638; Newcomb P and Trentham-Dietz A, 'Breastfeeding practices in relation to endometrial cancer risk, USA', *Cancer Causes and Control* (2000), vol 11, no 7, pp 663-667.

27 Polatti F et al, 'Bone mineral changes during and after lactation', *Obstetrics and Gynaecology* (1999), vol 94, no 1, pp 52-56.

28 Karlson E et al, 'Do breastfeeding and other reproductive factors influence future risk of rheumatoid arthritis?', *Arthritis and Rheumatism* (2004), vol 50, pp 3458-3467.

29 Steube A et al, 'Duration of lactation and incidence of type 2 diabetes', *Journal of the American Medical Association* (2005), vol 294, pp 2601-2610.

30 College of Lactation Consultants Victoria Inc, sub 158, p 2.

31 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 7; Australian College of Midwives, Baby Friendly Health Initiative, sub 185, p 3.

32 Mezzacappa E, 'Breastfeeding and maternal stress response and health', *Nutrition Reviews* (2004), vol 62, pp 261-268; Hoyle Z, Post and Antenatal Depression Association, transcript, 7 June 2007, pp 58-64.

33 Oddy W, Telethon Institute for Child Health Research, sub 216, pp 16-18.

The unique properties of breast milk

3.26 Breast milk is a complex living substance and a food that is nutritionally complete for babies until six months of age.³⁴ No formula product can exactly replicate breast milk.³⁵ It is a 'bioactive fluid' with changing physical properties and concentrations of nutrients. It is also extremely important in providing protection against infection:

Human milk represents a most valuable weapon for enhancing the immature immunologic system of the neonate and for strengthening its host defence mechanisms against infective or other foreign agents.³⁶

3.27 Colostrum, the secretion produced in the first few days after birth, is nutrient-rich, and contains essential proteins, vitamins, enzymes, growth factors, antibodies and non-pathogenic bacteria to protect against illness.³⁷ This first secretion gradually changes into mature milk during the first one to two weeks after birth. For example, there are lower concentrations of fat in colostrum than in mature milk but higher concentrations of protein and minerals.³⁸

3.28 Breast milk is dynamic and interactive. Its composition varies between individuals, depending on diet and stages of lactation. Breast milk's complex biochemistry means that it changes from morning to night and even over the course of a feed. The milk first ingested by a baby during a feed has a lower fat content, which steadily increases until the feeling of 'satiety' is reached.³⁹

3.29 The concept of breast milk as a food should be better emphasised. Dr Debra Hector from the New South Wales Centre for Public Health Nutrition noted that there had been 'somewhat of a separation between breastfeeding and the introduction of solid foods into the diet.'⁴⁰ People may not perceive breast milk as a food, considering

34 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), pp 4-5.

35 Stockwell D, Food Standards Australia New Zealand, transcript, 13 June 2007, p 11.

36 Oddy W, 'Breastfeeding protects against illness and infection in infants and children: a review of the evidence', *Breastfeeding Review* (2001), vol 9, no 2, p 15.

37 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 4.

38 Wagner C, 'Human milk and lactation', eMedicine, 2006, viewed on 30 July 2007 at <http://www.emedicine.com/ped/topic2594.htm>.

39 Wagner C, 'Human milk and lactation', eMedicine, 2006, viewed on 30 July 2007 at <http://www.emedicine.com/ped/topic2594.htm>.

40 Hector D, NSW Centre for Public Health and Nutrition, transcript, 4 June 2007, p 43.

that nutrition begins with solids. This can lead to a diminished understanding of the crucial importance of breast milk in establishing good nutrition from birth.

Promoting the health benefits of breastfeeding

- 3.30 Given the extensive health benefits for both babies and mothers that can be attributed to breastfeeding, the committee believes there should be greater public promotion of the benefits of breastfeeding. This was recommended in a number of submissions to the inquiry.⁴¹
- 3.31 There were strong views expressed about the way in which public health messages around breastfeeding ought to be framed. Some argued that the slogan 'breast is best' is misleading, and can be interpreted as meaning that breastfeeding is a lofty ideal, but unattainable for many mothers in reality. Instead, it would be better to promote breastfeeding as the normal and natural way to feed babies.⁴² Others suggested that a public health campaign on breastfeeding would be more effective if the risks of formula-feeding were more heavily emphasised.⁴³ However, focusing on the risks of infant formula may have the effect of alienating those mothers whose sincere efforts to breastfeed have not been supported strongly enough by the community and health profession.
- 3.32 The committee believes that a positive campaign promoting breastfeeding as normal would be the most effective way to present the breastfeeding message. Any public health campaign must also be supported by wider practical action and structural changes in the community and health profession to help breastfeeding mothers.
- 3.33 The committee supports breastfeeding for as long as the mother and child are comfortable to continue, but agrees with experts such as Professor Binns, who noted that more benefit would be gained from

41 Werner C, sub 6, pp 2-3; Jeffery L, sub 34, p 3; Wighton M, sub 41, p 2; Pollock R, sub 60, p 1; Trinder M, sub 128, p 1; Tattam A, sub 199, pp 2-3; Australian Nursing Federation, sub 271, p 3; Pharmacy Guild of Australia, sub 331, p 2; Bowen M, sub 337, p 8.

42 Dixon G, sub 30, p 2; Binns C, sub 86, p 2; O'Dowd Y, sub 33, p 2; David Q, sub 37, p 1; Rothenbury A, sub 87, p 2; Hay L, sub 153, p 5; Day S, sub 157, p 2; Marazakis M, sub 202, p 1; Australian Breastfeeding Association (Queensland Branch), sub 207, p 3; Stephenson C, sub 278, p 1.

43 Walsh A, sub 20, p 1; Ward K, sub 56, p 2; Christoff A, sub 72, p 2; Dawson P, sub 98, p 2; Mathewson S, sub 111, p 2; Hinkley T, sub 115, p 1; Buckley M, sub 160, p 1; Eldridge S, sub 214, p 3; Fuller R, sub 228, p 2.

promoting exclusive breastfeeding for the first six months of a baby's life, than to promote prolonged breastfeeding beyond 12 months of age.⁴⁴ It should be noted that the health benefits of breastfeeding are at a maximum in the earliest months of life.⁴⁵

'The gift of human milk'

- 3.34 A human milk bank is a service that collects, screens, processes and distributes donated human milk, primarily for babies who cannot be breastfed.⁴⁶ Given that breast milk provides the best protection against infection and promotes proper growth and nutrition for healthy full-term babies, it is particularly important that sick and premature babies also have access to breast milk, especially when their own mother cannot provide it (for example, due to low milk supply, HIV infection, breast cancer treatment, or when the baby is on life support).
- 3.35 The WHO's Global Strategy for Infant and Young Child Feeding lists a number of feeding options for those few health situations where infants cannot, or should not, be breastfed. The alternatives are: expressed milk from the baby's mother, breast milk from a wet nurse or a human milk bank, or a breast milk substitute.⁴⁷ The WHO has long affirmed the value of milk banks in its policies on infant feeding.⁴⁸ In 1980, the World Health Assembly endorsed a joint WHO/UNICEF resolution which stated: 'Where it is not possible for the biological mother to breastfeed, the first alternative, if available, should be the use of human milk from other sources. Human milk banks should be made available in appropriate situations.'⁴⁹
- 3.36 Milk banking originated in Europe in the early twentieth century as technological and hygienic advances allowed human milk to be refrigerated and stored. Prior to this, it was common practice for

44 Binns C, sub 86, p 3.

45 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 14.

46 Lording R, sub 186, p 7.

47 WHO Global strategy for infant and young child feeding, 2002, viewed on 30 July 2007 at http://www.who.int/nutrition/publications/gf_infant_feeding_text_eng.pdf, p 10.

48 Arnold L, 'Global health policies that support the use of banked donor human milk: a human rights issue', *International Breastfeeding Journal* (2006), vol 1, no 26, pp 5-6.

49 WHO/UNICEF Joint Resolution, 1980, quoted in Wight N, 'Donor Human Milk for Preterm Infants', *Journal of Perinatology* (2001), vol 21, p 251.

babies whose mothers could not breastfeed to receive milk from another lactating mother or a 'wet nurse'. The number of milk banks grew across the developed world throughout the century, although many milk banks closed their doors during the 1980s due to fears surrounding HIV/AIDS transmission. However, as research demonstrated the safety of pasteurisation techniques in eliminating HIV and other viruses, milk banks experienced a resurgence as a safe source of donor milk.⁵⁰

- 3.37 Milk banks provide an important alternative source of human milk. Because of human breast milk's unique immunologic properties, access to this milk is often critical to the survival of sick and premature babies with under-developed immune systems. Donated breast milk has also been used successfully to treat babies with intolerance to formula, severe allergies, immune deficiencies and congenital abnormalities. It also helps babies recover from surgery.⁵¹
- 3.38 One of the most serious health risks faced by premature babies is neonatal necrotising enterocolitis (NEC), a gastrointestinal infection which effectively causes a death of the bowel area.⁵² Mortality rates from NEC in neonatal intensive care units can be as high as 40 per cent. Premature babies fed exclusively with breast milk, which promotes the maturation of the gut, have a reduced chance of succumbing to NEC. In a study of 900 premature babies, NEC was six to ten times more common in those who received only formula, than in those fed breast milk alone.⁵³
- 3.39 Today human milk banks operate across North and South America, Europe and Asia.⁵⁴ Brazil is renowned for its large network of milk banks. In 1999-2000, more than 150 milk banks processed over 218,000 litres of milk that was given to 300,000 premature and low birth weight babies, saving the Brazilian Government an estimated \$620 million that year.⁵⁵

50 Human Milk Banking Association of North America, 'The History of Milk Banking', 2003, viewed on 30 July 2007 at <http://www.hmbana.org/index.php?mode=history>.

51 Lording R, 'A review of human milk banking and public health policy in Australia', *Breastfeeding Review* (2006), vol 14, no 3, p 22; Wight, p 251.

52 Moorhead A, Royal Women's Hospital, Melbourne, transcript, 7 June 2007, p 31.

53 Lucas A and Cole TJ, 'Breast milk and neonatal necrotising enterocolitis', *The Lancet*, (1990), vol 336, pp 1519-1523.

54 Lording R, 'A review of human milk banking', p 23.

55 Arnold L, p 7 (note, adjusted to AUD).

When my mother had her babies in the mid to late 1960s, she was asked by midwives to wet-nurse other babies on the maternity ward. Indeed, across the world, wet-nursing and the giving of human milk to mothers and babies in need is a regular practice, accepted as a gift between women. With fear of AIDS and legal implications, this culture of sharing has been taken away from women and we are the poorer for it. To set up a network of milk banks across the country would reintroduce the opportunity for giving the gift of human milk.⁵⁶

Milk banks in Australia

- 3.40 Australia currently has only two donor milk banking facilities, although the Royal Women's Hospital in Melbourne noted its capacity (and that of other hospitals) to freeze a mother's expressed milk for her own baby's consumption.⁵⁷ In 2006, Australia opened its first milk bank in more than two decades at the King Edward Memorial Hospital in Perth, which caters for premature babies.⁵⁸ The 'PREM Bank' in Perth is sponsored by the Rotary Clubs of Thornlie and Belmont, the Perron Charitable Trust and Telethon and is the result of a collaboration between North Metropolitan Health Service, The University of Western Australia and the Women and Infants Research Foundation.
- 3.41 The Mothers Milk Bank, operating at the John Flynn Medical Centre on the Gold Coast, is Australia's only other milk bank. The committee visited this site in the course of the inquiry. The Mothers Milk Bank presently operates as a pilot program with limited funding and support from volunteers. There are about 500 registered donors, with around 280 currently donating milk. After instruction in sterile techniques, these women express once a day and freeze the milk which is collected by a volunteer every week. The milk is then screened, pasteurised, re-tested, and delivered to babies and mothers in need. On a weekly basis the Mothers Milk Bank pasteurises nine litres of milk.⁵⁹
- 3.42 The committee heard from parents whose babies had thrived on donations from the Mothers Milk Bank. Twins born prematurely were

56 Eldridge S, sub 214, p 9.

57 Moorhead A, Royal Women's Hospital, Melbourne, transcript, 7 June 2007, p 31.

58 Lording R, 'A review of human milk banking', p 23.

59 Jones J and Ryan M, Mothers Milk Bank, transcript, 18 April 2007, p 8.

fed with their mother's expressed breast milk and supplemented with donor milk for two months.⁶⁰ Another mother, whose son had severe allergic reactions to formula, struggled with her own low milk supply. With donor milk, her son's nutritional and health needs are being met.⁶¹

Box 3.1 Mothers Milk Bank Pty Ltd

Mothers Milk Bank Pty Ltd is a private not-for-profit company formed by Midwife and Nurse Manager, Marea Ryan, of the John Flynn Private Hospital on the Gold Coast.

This vital health service, the first of its kind on the East Coast, provides pasteurised donor mother's milk to infants where human milk is not available, ensuring optimal physical and neurological development for these infants. In conjunction with a similar initiative established in Perth, the Mothers Milk Bank (MMB) is committed to seeing a network of donor milk banks operational around Australia within ten years. MMB shares a common vision with our Perth colleagues - 'Human Milk for Human Babies' - every baby needs to have the best food source available. Initially MMB will offer pasteurised milk on demand to premature and sick infants. In the long-term, MMB aims to provide an avenue whereby human milk is available for all babies up to the age of at least six months. This will lay the foundation of the future health of Australian children.

Source: Mothers Milk Bank, sub 217.

Barriers to milk banking

3.43 Roslyn Lording, a health promotion practitioner and hospital social worker, is the author of a 2006 review of human milk banking in Australia. She has analysed some of the barriers to milk banking in the Australian context. There is anecdotal evidence that there would be 'initial reluctance'⁶² towards milk banking amongst health professionals, including neonatologists, who may be unconvinced about the value of donor milk over formula.⁶³ The costs and logistics of establishing milk banks may also be a disincentive, especially when formula is more readily accessible.⁶⁴

60 Community statements, transcript, 18 April 2007, pp 46-47.

61 Community statements, transcript, 18 April 2007, pp 49-50; McMaster D, transcript, 18 April 2007, p 41.

62 McMaster D, transcript, 18 April 2007, p 42.

63 Lording R, 'A review of human milk banking', pp 25-26.

64 Lording R, 'A review of human milk banking', pp 25-26; Schmidt P, Gold Coast Hospital, transcript, 18 April 2007, p 36.

- 3.44 Concerns about the safety of milk banking and infection control have also been raised.⁶⁵ However, evidence from Australia and around the world shows that modern pasteurisation techniques are effective in preventing the transmission of infection and maintaining the quality of the milk.⁶⁶
- 3.45 Another minor issue relates to the classification of breast milk as a body tissue in some jurisdictions and as a food in others. There are calls for milk to be classified consistently as a food across Australia. The matter is currently under review in Queensland.⁶⁷
- 3.46 NSW Health notes that given the increasing community interest in human milk banks, a review should be undertaken prior to any wider establishment in Australia. Comprehensive evidence assessing the benefits of donor human milk for premature babies and the possible risks of disease transfer has not yet been compiled in Australia. Therefore, a review should address these issues and also look at a national regulatory and quality framework within which a network of milk banks in Australia could operate. The framework would need to address a number of minimum standards, including donor recruitment and selection, storage and handling of milk, testing and pasteurisation of milk, and incident reporting.⁶⁸
- 3.47 Keeping these issues in mind, the committee believes that government support for milk banks would constitute an important public health investment.⁶⁹ With sufficient funding, strict safety measures and greater awareness of the benefits of breast milk amongst health professionals and the public, the barriers to milk banking can be overcome.

65 Lording R, 'A review of human milk banking', p 26; Schmidt P, Gold Coast Hospital, transcript, 18 April 2007, pp 35-36.

66 Lording R, 'A review of human milk banking', p 26; Ryan M, Mothers Milk Bank, transcript, 18 April 2007, p 5.

67 Ryan M, Mothers Milk Bank, transcript, 18 April 2007, p 3.

⁶⁸ NSW Health, sub 479, p 35.

69 Eldridge M, sub 25, p 2; Cheers A, sub 29, p 6; Dixon G, sub 30, p 2; Long H, sub 80, p1; Moore E, sub 102, p 2; Beyer L, sub 105, p 1; MacDonald H, sub 106, p 1; Clements F, sub 122, p 5; Dickson E, sub 162, p 2; Public Health Association of Australia, sub 181, p 10; Australian College of Midwives, Baby Friendly Health Initiative, sub 185, p 13; Lording R, sub 186, pp 7-8; Eldridge S, sub 214, p 8; Australian Breastfeeding Association, New South Wales Branch, sub 276, p 13; Australian Breastfeeding Association, sub 306, p 28; Women's Electoral Lobby, sub 310, p 5; New South Wales Baby Friendly Health Initiative, sub 339, p 15; de Vries L, sub 359, p 2; Campbell A, sub 361, p 2; Martin P, sub 373, p 1; Cuff S, sub 382, p 1; Brittain H, Logan Hospital, transcript, 18 April 2007, p 31.

The future of milk banks in Australia

- 3.48 It is clear to the committee that a national network of publicly funded milk banks would give Australian babies a healthier start to life, reduce health care costs and provide real support for mothers who are unable to provide their baby with breast milk. Gwen Moody from the Australian Lactation Consultants Association described to the committee an example of a woman who is unable to breastfeed.

I have got a woman with breast cancer at the moment who is seven or eight months pregnant. She was starting chemotherapy on Friday, so in the week before, because the baby is potentially going to be born early, we got her expressing colostrum crazily so we would at least set the baby's gut up because she had breastfed her two previous children. She has got inflammatory breast cancer, which is fairly advanced.⁷⁰

- 3.49 Professor Peter Hartmann of the King Edward Memorial Hospital milk bank estimated that if a premature baby in their unit is given breast milk instead of formula, the recovery period is shortened by two weeks with cost savings of \$18,200.⁷¹ In Queensland, there were 4,300 premature babies in one year who did not receive any breast milk and were therefore at greater risk for complications, infections and longer hospital stays.⁷²

- 3.50 Interest in being a milk donor is steadily growing.⁷³ Milk banks could also offer solutions to those mothers, such as the woman below, who despair at having to dispose of their own excess milk, knowing that it would be invaluable to other mothers and babies.

It was a real tragedy, I had at least 12 bottles of milk (240ml each) in my refrigerator, and I was forced to dispose of it all down the sink when I got home, all this liquid gold. It broke my heart to do so, especially when I think of any preemie baby that could have really benefited from having breast milk, as opposed to formula.⁷⁴

70 Moody G, Australian Lactation Consultants Association, transcript, 4 June 2007, p 34.

71 Australian Breastfeeding Association, New South Wales Branch, sub 276, p 13.

72 Ryan M, Mothers Milk Bank, transcript, 18 April 2007, pp 2-3.

73 Ryan M, Mothers Milk Bank, transcript, 18 April 2007, p 9; Jeffery L, sub 34, p 5; Greenlees N, sub 324, pp 1-2; Robins J, sub 50, p 1; Virgo H, sub 155, p 1; Fellows M, sub 304, p 2; Nielsen L, sub 355, p 2; community statements, transcript, 18 April 2007, p 47; community statements, transcript, 18 April 2007, p 49.

74 Smith A, sub 110, p 2;

- 3.51 Mothers and babies in remote communities would also benefit from a system which provided the infrastructure to transport breast milk as required. With a proper courier service, the Mothers Milk Bank could have delivered milk daily to a mother in a remote area of Queensland whose milk supply was low and who had no access to formula.⁷⁵
- 3.52 A commitment to a national system of milk banks in Australia should not only be a stand-alone policy, but complement a range of other measures to support breastfeeding and value of breast milk⁷⁶ (see chapter 4). In Brazil, donor milk banking goes hand in hand with efforts to promote breastfeeding as the cultural norm.⁷⁷ This mutually reinforcing approach would help to secure the health of Australia's next generation for years to come.

Recommendation 8

- 3.53 **That the Department of Health and Ageing fund a feasibility study for a network of milk banks in Australia including the development of a national regulatory and quality framework within which a network of milk banks in Australia could operate. The feasibility study should include funding pilot programs at the Mothers Milk Bank at the John Flynn Private Hospital, Gold Coast and the King Edward Memorial Hospital milk bank in Perth.**

The economic benefits of breastfeeding

- 3.54 One of the committee's main interests in undertaking this inquiry was to investigate the short and long-term impacts on the health of Australians if breastfeeding rates were increased. The effect of breastfeeding on the sustainability of the health system was also examined.
- 3.55 There are strong economic arguments in favour of increasing breastfeeding rates in Australia. As already shown in this chapter, breastfeeding and breast milk provide well-established health benefits, including greater protection against some chronic diseases, for both mothers and babies. These advantages should also be viewed

75 Ryan M, Mothers Milk Bank, transcript, 18 April 2007, p 7.

76 Lording R, sub 186, p 8.

77 Arnold L, 'Global health policies', p 7.

from an economic perspective, given that fewer cases of illness and hospitalisations at the population level translate into significant cost savings for the health care system.

Economists have rarely considered economic aspects of breastfeeding, focusing their attention on the market economy. In recent years the importance of the unpaid economy including the care work of mothers has become more visible. It has also become evident that the policy needs to take account of the unpaid household economy to avoid unintended impacts on the work that families do in raising children – Australia’s ‘human capital.’

Breastfeeding is a good example of women’s reproductive work that is neither visible nor properly valued by existing economic statistics. Because it is neither visible nor valued, and because it competes in the market on unequal terms, breastfeeding remained unprotected from pressure of social and economic change and from ‘unfair’ market competition.⁷⁸

- 3.56 Dr Julie Smith, a research fellow at the Australian Centre for Economic Research on Health, has conducted a number of studies into the economic impacts of breastfeeding in Australia. The committee has drawn extensively on her work and the evidence she presented in the following discussion of the economic aspects of breastfeeding.⁷⁹

The economic value of breast milk and breastfeeding

- 3.57 A number of inquiry participants argued that the economic value of breast milk should be recognised as a proportion of Australia’s gross domestic product (GDP). Dr Smith estimates that around 33 million litres of human milk per year is produced in Australia at present breastfeeding rates.⁸⁰ Using the milk bank prices in Europe, she estimates that the value of breast milk produced by Australian women is around \$2 billion per year. The annual retail value of formula is considerably less at around \$135 million.⁸¹ Breast milk’s estimated value is equivalent to around 0.5 per cent of GDP, or six per cent of national food consumption. The impact of breastfeeding on the

78 Smith J, Australian Centre for Economic Research on Health, sub 313, p 2.

79 Smith J, Australian Centre for Economic Research on Health, sub 313; Smith J, Harvey P, Australian Centre for Economic Research on Health, sub 319.

80 Smith J, transcript, 26 March 2007, p 18.

81 Smith J, Australian Centre for Economic Research on Health, sub 313, p 4.

economy would be even greater if exclusive breastfeeding to six months was widely practised:

If all Australian mothers were to breastfeed as the World Health Organization recommended, there would be an increase in economic output in the form of milk of around \$3 billion.⁸²

- 3.58 Another concern raised by some inquiry participants was that the time invested in breastfeeding by mothers is not given economic value in Australia. Dr Smith examined this 'economic time cost' in the nationwide Time Use Survey of New Mothers, which showed that mothers who breastfeed to recommended levels spend around 16 to 17 hours per week on this activity for the first three to six months. The emotional component to breastfeeding should also be seen as a significant human capital investment. These mothers spend an additional six to eleven hours per week in 'emotional care', which contributes positively to the child's mental and emotional health. While the baby undoubtedly benefits from these breastfeeding interactions, such time-intensive unpaid care on the part of the mother is not recognised in economic terms.⁸³

Cost savings to the health system

- 3.59 Breastfeeding protects against a range of diseases and therefore has the potential to alleviate costs to the health care system in both the short and long-term. The Australian Medical Association notes that the potential benefits of increasing the breastfeeding rate would be extremely cost-effective, ensuring improved health outcomes and the sustainability of health care in Australia.⁸⁴ The NHMRC states in the Dietary Guidelines that:

The total value of breastfeeding to the community makes it one of the most cost-effective primary prevention measures available and well worth the support of the entire community.⁸⁵

82 Smith J, transcript, 26 March 2007, p 26

83 Smith J, Australian Centre for Economic Research on Health, sub 313, p 9; Smith J, transcript, 26 March 2007, pp 22-23.

84 Australian Medical Association, sub 358, p 2.

85 National Health & Medical Research Council, *Dietary Guidelines for Children and Adolescents in Australia* (2003), p 14.

Short-term impacts – economic costs of premature weaning

- 3.60 According to a 2002 study conducted by Dr Smith and colleagues at the Canberra Hospital, there are significant hospital costs associated with early weaning. It was found that less than 10 per cent of babies in the ACT were exclusively breastfed until the recommended six months of age. Early weaning was estimated to add around \$1 to \$2 million to annual hospitalisation costs for gastrointestinal illness, respiratory and ear infections, eczema and neonatal necrotising enterocolitis (NEC). Using these figures, savings across the Australian hospital system could be \$60 to \$120 million for these illnesses alone.⁸⁶
- 3.61 A preliminary economic analysis of breastfeeding in Australia in 1997 found that a minimum of \$11.75 million could be saved if the prevalence of exclusive breastfeeding at just three months was increased from 60 per cent to 80 per cent. This analysis only took into account four illnesses – gastroenteritis, NEC, eczema and type 1 diabetes. The author noted that further cost savings could be achieved if other illnesses and reduced maternal absenteeism were also taken into account.⁸⁷
- 3.62 International studies have also shed light on the extent of savings to health systems. For example, an Italian study showed that for babies exclusively breastfed at three months, there were lower health care costs during the first year of life because of fewer hospital admission and ambulatory care episodes.⁸⁸ A US study found that for every 1,000 babies never breastfed (compared to 1,000 babies exclusively breastfed), there were more than 2,000 extra visits to the doctor, 212 extra days of hospitalisation and 609 extra prescriptions in the first year of life.⁸⁹
- 3.63 A number of submissions also highlighted the Commonwealth Government's recent funding commitment of \$25 million for a rotavirus vaccine. There are around 20,000 hospital admissions every year for this common gastrointestinal infection in children under five years old. It is suggested that an investment of the same extent

86 Smith J et al, 'Hospital system costs of artificial infant feeding: estimates for the Australian Capital Territory', *Australian and New Zealand Journal of Public Health* (2002), vol 26, no 6, pp 543-551.

87 Drane D, 'Breastfeeding and formula feeding: a preliminary economic analysis', *Breastfeeding Review* (1997), vol 5, no 1, pp 7-15.

88 Cattaneo A et al, 'Infant feeding and the cost of health care', *Acta Paediatrica* (2006), vol 95, no 5, pp 540-546.

89 Ball T and Wright A, 'Health care costs of formula-feeding in the first year of life', *Pediatrics* (1999), vol 103, no 4, pp 870-876.

towards breastfeeding promotion could further reduce the burden on the health system caused not only by rotavirus, but a range of common early childhood infections.⁹⁰

- 3.64 These findings strengthen the case for lifting Australia's breastfeeding rates, given the immediate health benefits and the reduced day-to-day strain on the health care system.

Long-term impacts – reducing the burden of chronic disease

- 3.65 As demonstrated earlier in this chapter, breastfeeding can protect against the development of a number of chronic conditions later in life, including obesity, diabetes and cardiovascular disease. Although this is a relatively new field of inquiry, international research suggests there are significant health system savings to be gained from improving breastfeeding rates. For example:

- a 2002 study of more than 500,000 babies born in England and Wales estimated that 33,100 asthma cases and 13,639 cases of obesity were directly attributable to a lack of breastfeeding⁹¹; and
- another UK study suggested that breastfeeding's protective effect against high blood pressure could prevent 3,000 coronary heart disease events and 2,000 strokes annually in those under 75 years of age.⁹²

- 3.66 Dr Smith and Dr Peta Harvey are currently investigating the links between breastfeeding and the costs of chronic disease treatment in Australia. Their preliminary findings suggest that between 11 and 28 per cent of the chronic disease burden in Australia could be attributed to a lack of breastfeeding during infancy.⁹³

- 3.67 Another factor to consider is the ongoing special education costs arising from poor health. For example, as discussed earlier, breastfeeding offers significant protection against middle ear infections. Recurrent infections can lead to language and learning difficulties in early childhood, with a need for speech therapy and

90 Clements F, sub 122, p 4; Davis A, sub 237, pp 1-2; Gribble K, School of Nursing, University of Western Sydney, sub 251, p 2; Davis A, sub 367, p 1.

91 Akobeng A and Heller R, 'Assessing the population impact of low rates of breastfeeding on asthma, coeliac disease and obesity: the use of a new statistical method', *Archives of Disease in Childhood* (2007), vol 92, pp 483-485.

92 Martin R et al, 'Breastfeeding in infancy and blood pressure in later life: systematic review and meta-analysis', *American Journal of Epidemiology* (2005), vol 161, no 1, pp 15-26.

93 Smith J, Harvey P, Australian Centre for Economic Research on Health, sub 319, p 2.

remedial education programs.⁹⁴ The broader impact of chronic disease on economic productivity should also be investigated.

- 3.68 It is clear that the relatively small effects from improving breastfeeding rates among individuals can have a potentially large impact on population health:

Breastfeeding is a one off 'intervention' that continues to reduce chronic disease risk throughout the life cycle. Unlike other interventions, such as exercise programs, or dietary changes, it does not have to be continued throughout the life cycle in order to maintain this protection, and so has no ongoing costs. This point means that it is likely to be very cost effective as a disease prevention measure. There are few other preventative health interventions which have proven permanent effects in reducing risk factors for chronic disease in such a variety of settings.⁹⁵

- 3.69 Thus, the committee sees merit in gathering further evidence on the economic impacts of breastfeeding. This would strengthen the case for government action and investment to improve breastfeeding rates in Australia.

Recommendation 9

- 3.70 **That the Department of Health and Ageing commission a study into the economic benefits of breastfeeding.**

94 Australian Breastfeeding Association, sub 306, p 10.

95 Smith J, Harvey P, Australian Centre for Economic Research on Health, sub 319, p 7.

