School of Public Health

Determinants of the Initiation and Duration of Breast-feeding

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Abstract

The primary objectives of this study were to determine the initiation and prevalence, up to six months post-partum, of breast-feeding amongst Perth women and to identify factors that influence the initiation and duration of breast-feeding. A self-administered baseline questionnaire was completed by 556 mothers prior to discharge. Those mothers who were breast-feeding at the time of completing the baseline questionnaire were followed-up by telephone interview at 2, 6, 10, 14, 18 and 24 weeks postpartum, or until they ceased to breast-feed.

In total, 88.1% of mothers commenced breast-feeding whilst in hospital. On discharge from hospital 83.8% of women were breast-feeding either fully (77.7%) or partially (6.1%) but by six months this figure had decreased to 49.9% of mothers breast-feeding.

Multivariate logistic regression analysis was used to determine which factors were associated with the initiation of breast-feeding. There was a strong association between the father's reported preference for breast-feeding and the initiation of breast-feeding (OR=10.18). The Cox's proportional hazards model was used to estimate the effect of independent variables on the duration of breast-feeding. The factor most strongly associated with breast-feeding duration was intended duration. Women who intended to breast-feed for less than four months were more likely to stop breast-feeding at any time compared with women who intended to breast-feed for at least four months (RR=5.01).

The results of this study suggest that breast-feeding initiation and duration rates in Perth have remained relatively stable over the last decade. However, breast-feeding duration continues to fall well short of the target of 80% of infants being either partially or fully breast-fed at six months. Recommendations are made for interventions which actively promote increased breast-feeding duration. In particular, emphasis should be placed on those strategies which will influence intended duration; influence the attitudes and beliefs of the mother's support network, particularly partners; and promote breast-feeding as the social norm.

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Table of Contents

List of tables

List of figures

1 Introduction

1.1 Significance of the study

Breast-feeding is recognised as being one of the 'most natural and best forms of preventive medicine' (Yeung et al. 1981) and is promoted internationally as the preferred method of feeding for infants up to the age of 4 to 6 months (WHO 1985; NHMRC 1989; Hendricks and Badruddin 1992). Breast milk offers several properties and functions that can be neither provided nor mimicked by infant formula. In particular:

- breast milk is a dynamic fluid that changes in composition throughout the day and over the course of lactation, providing for the infant the specific nutrients needed at each age (Forsyth 1992; Lawrence 1994);
- breast milk contains a variety of components with immunological properties (Forsyth 1992; Hanson 1993; Newman 1995) which are thought to offer unique protection against a number of infections common in infancy (Victora et al. 1987; Howie et al. 1990; Beaudry et al. 1995). Furthermore, breast-feeding reduces or eliminates exposure to food and waterborne pathogens common with early weaning practices in developing countries (Van Derslice et al. 1994);
- infants are very seldom allergic to their mother's milk (Lawrence 1994). In addition, while breast-feeding may not prevent allergic diseases, as commonly proposed (Kramer 1988), food allergies appear to be less frequent in infants who are exclusively breast-fed, and breast-feeding delays the development of atopic dermatitis, particularly in allergic families (Halken et al. 1992; Saarinen and Kajosaari 1995).

According to Cunningham et al. (1991), until recently there has been a general belief that the benefits of breast-feeding are limited to the prevention of acute infectious diseases during infancy, and there are no lasting benefits. However, new data are emerging which suggest that breast-feeding confers

other short- and long-term health advantages and may reduce the frequency of certain chronic diseases later in life. There is evidence to suggest that breast-feeding is protective against type 1 diabetes mellitus (Gerstein 1994), Sudden Infant Death Syndrome (SIDS) (Ford et al. 1993), inflammatory bowel disease (Calkins and Mendeloff 1986), coeliac disease (Kelly et al. 1989), multiple sclerosis (Piscane et al. 1994), pyloric stenosis (Piscane et al. 1996) and some childhood cancers (Davis et al. 1988).

In addition, breast-feeding may offer several advantages for the breast-feeding mother and may exert a protective effect against breast cancer (Thomas and Noonan 1993; Katsouyanni et al. 1996), ovarian cancer (Siskind et al. 1997) and hip fracture in old age (Cumming and Klineberg 1993). Also, there is evidence that breast-feeding leads to significantly faster loss of body weight and reduction in hip circumference than does formula feeding (Kramer et al. 1993).

Finally, but no less importantly, breast-feeding exerts a natural contraceptive effect (Thapa et al. 1988; Howie 1993; Hanson et al. 1994) and is economically cheaper than bottle-feeding (Melville 1991). Two benefits which are of particular importance to families and governments in developing countries.

Although the benefits of breast-feeding are well documented (Akre 1989; Cunningham et al. 1991; Forsyth 1992) and generally well accepted among health professionals and the general public alike, breast-feeding is not universal, especially among Western populations. While lactation is a natural physiological process, breast-feeding does not come naturally to mothers but must be learned. As a result of the medicalisation of child birth and child-rearing practices which occurred in Western culture in the first half of this century, women seldom trust themselves or other women to know how breast-feeding works (Mulford 1995).

A rapid decline in breast-feeding was experienced in most Western countries during the 1950s and 1960s. Breast-feeding rates bottomed-out in the 1970s and increased through the 1980s, peaking in the mid- to late- 1980s. However, since this time there is evidence that the prevalence of breast-feeding has declined in the USA (Ryan et al. 1991) and the UK (Emery et al. 1990), especially among socio-economically disadvantaged groups. Similar declines in breast-feeding initiation and duration have not been reported for recent Australian studies (Redman et al. 1992; Landers et al. 1995).

1.2 Justification of the study

Breast-feeding was the subject of much research interest in the 1970s and 1980s. Firstly, researchers were anxious to identify and document reasons for the decline in breast-feeding which occurred in most Western countries until the late-1970s. After this time attention was directed at identifying reasons for the subsequent increase in breast-feeding that occurred through the mid- to late-1980s. Much of the research at this time was focused on identifying the determinants of breast-feeding initiation and duration. However, many studies conducted prior to the mid-1980s were methodologically flawed.

Some difficulties identified in previous studies include:

a) lack of consistent definitions of breast-feeding (Labbok and Krasovec 1990; Armstrong 1991);
b) insufficient sample size (Winikoff 1981) and selection bias (Simopoulos and Grave 1984);
c) reliance on maternal recall of infant feeding events (Winikoff 1981) and
d) use of unvariate statistical analysis which does not control for confounding factors or identify interactions between factors (Persson 1985).

Continued research into the epidemiology and behavioural aspects of breast-feeding is warranted as breast-feeding rates in Australia are lower than the recommended targets (Nutbeam et al. 1993). In addition, while it does not appear, at this stage, that Australian breast-feeding rates are declining

(Redman et al. 1992; Landers et al. 1995), as reported in the USA (Ryan et al. 1991) and UK (Emery et al. 1990), the need to continue to promote and support breast-feeding, and to monitor infant feeding practices, is clear if such an occurrence is to be prevented in the future.

Limited research on Australian breast-feeding rates has been conducted over the last decade. This study aims to fill this gap in epidemiological data and utilises multivariate analytical techniques, not previously used in most research conducted to date in Australia, thereby overcoming a major limitation of earlier research in this area.

1.3 Objectives of the study

1. To document the initiation and prevalence of breast-feeding up to six months post-partum amongst Perth mothers.
2. To identify factors which encourage mothers to commence and maintain breast-feeding.
3. To identify factors which discourage mothers from commencing and maintaining breast-feeding.
4. To identify and describe women's breast-feeding experiences
5. To document social attitudes towards breast-feeding.
6. To make recommendations for the development of health promotion programs based on the findings of this study.

1.4 Benefits of the study

This study will identify barriers to the initiation of breast-feeding and successful breast-feeding. It will also identify those women most at risk of not breast-feeding or ceasing breast-feeding before the recommended period of 4-6 months. This information, along with information gained from focus group discussions with high risk women, will help to identify strategies to promote and support breast-feeding. As a result, it is hoped that this information will be used by the Government and other interested groups in the design of

successful breast-feeding interventions which will, in turn, result in the achievement of the National Goals and Targets of 90% of mothers breast-feeding on discharge from hospital and 80% of women at least partially breast-feeding at six months postpartum (Nutbeam et al. 1993).

1.5 Limitations of the study

The study population was recruited from two public hospitals in the Perth metropolitan region which drew their patients from primarily low-income areas. The choice of hospitals was deliberate as low-income women are often under-represented in population-based studies of breast-feeding rates. In addition, it is this population group which is most at risk of public health problems. Therefore, while the study sample is representative of the population from which it was drawn it is not necessarily representative of the whole of Perth or Western Australia, or indeed Australia.

It is possible that the design of the study, which involved frequent monthly contact over a six month period, may have favourably influenced the pattern of feeding amongst study participants. While no control group was included in this study, the results of a recent Danish study, which involved similar frequent contact with a much greater subject burden, suggest that breast-feeding patterns were unlikely to have been influenced by the study design. Michaelsen et al. (1994) in a study which required monthly contact involving test weighing, blood tests and food records, included a control group in their study to investigate whether frequent contact would influence the pattern of feeding, including the duration of feeding. They found that there was no significant difference in the demographic characteristics of the control and study groups, nor the total duration of breast-feeding.

A possible selection bias may have been introduced as a result of the multivariate analysis procedures. In all statistical packages, only cases with complete data sets can be entered into a multivariate model. As a result only

354 cases of a possible 466 breast-feeding mothers (76%) were analysed using the Cox regression model. Similarly, only 437 of the total sample of 556 mothers (79%) were analysed using the multivariate logistic regression model. It was not possible to check whether these cases were missing at random or whether the missing data was in some way connected to an explanatory factor or the independent variable. For example, a woman whose partner was unemployed may not have wished to reveal this information. Similarly, a relatively large number of women chose not to reveal details about their family income.

1.6 Definitions

Incidence of breast-feeding is the proportion of sampled babies who were breast-fed initially (White et al. 1992).

Prevalence of breast-feeding refers to the proportion of all sampled babies still being wholly or partially breast-fed at specified ages (White et al. 1992).

Breast-fed initially refers to all babies whose mothers put them to the breast at all, even if this was on one occasion only (White et al. 1992).

Duration of breast-feeding is the length of time for which breast-feeding continued at all, regardless of when bottles or foods other than breast milk were introduced (White et al. 1992).

Full breast-feeding includes *exclusive* and *almost exclusive breast-feeding* and indicates that breast milk was the only source of milk given to the infant regardless of supplementation with other fluids such as water and orange juice (Labbok and Krasovec 1990; Perez-Escamilla et al. 1992).

Exclusively breast-fed indicates that the infant received only breast-milk, no water, other drinks or food (Labbok and Krasovec 1990).

Almost exclusively breast-fed indicates that the infant may have received small amounts of culturally valued supplements - water, water-based drinks, fruit juice, ritualistic fluids (Labbok and Krasovec 1990).

Partial breast-feeding is taken to mean that breast milk was used in combination with infant formula (Perez-Escamilla et al. 1992).

Any breast-feeding indicates that the infant was either fully or partially breast-fed (Perez-Escamilla et al. 1992).

Still breast-fed refers to all babies whose mothers were breast-feeding at all at a specified age, even if they were also bottle fed or receiving other food (White et al. 1992).

Demand feeding - the unrestricted pattern of breast-feeding characterised by *ad libitum* day and night feedings, facilitated by close contact between mother and infant.

Rooming-in - the practice of having the infant remain with the mother on a 24 hour basis.

Supplementary feeding - the replacement of an entire feed with infant formula (Coreil and Murphy 1988).

Complementary feeding - feeding of infant formula immediately after a breast-feed to complete a meal (Coreil and Murphy 1988).

Doula - someone (frequently the mother of the new mother) who supports the new mother and helps her with household duties, allowing her time to relax, establish her milk supply and become adjusted to her infant's needs (Barron et al. 1988).

1.7 Abbreviations

CI	Confidence interval
IMS	Insufficient Milk Syndrome
LBW	Low birth weight (< 2500g)
NHMRC	National Health and Medical Research Council
NMAA	Nursing Mothers Association of Australia
NZ	New Zealand
OR	Odds ratio
RR	Relative risk
SCN	Special Care Nursery
SES	Socio-economic status
SIDS	Sudden Infant Death Syndrome
sIgA	Secretory immunoglobulin A
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
USA	United States of America
VLBW	Very low birth weight (< 1500g)
WHO	World Health Organization

2 Literature review

2.1 Benefits of breast-feeding

The benefits of breast-feeding over formula feeding are well recognised and documented. Internationally, breast-feeding is promoted as the preferred method of feeding for infants up to the age of 4 to 6 months (WHO 1985; NHMRC 1989). As the primary purpose of this thesis is to identify determinants of breast-feeding the benefits of breast-feeding will only be reviewed briefly.

2.1.1 Nutritional properties of breast milk

Breast milk is a dynamic fluid that changes in composition throughout the day and over the course of lactation, providing for the infant the specific nutrients needed at each age (Lawrence 1994). The unique nutritional characteristics of breast milk are too many to discuss in this thesis but the major characteristics are summarised in Table 2.1.

Table 2.1: Nutritional characteristics of breast milk

Component	Characteristics
Protein	↓ content than other animals, results in a lower renal solute load and less strain on the immature kidney[1] Whey:casein ratio 60:40, CM 80:20, most formula adapted to 60:40[2]. Casein in BM is softer and less compact than CM and formula curd, reduces gastric emptying time and facilitates digestion[1].

BM= Breast milk; CM = Cow's milk
Source [1] Akre, 1989; [2] Lawrence, 1994; [3] Koletzko et al., 1992; [4] Wagner et al., 1996

Protein cont.	Whey proteins of BM are mainly α-lactalbumin. β-lactalbumin is the chief component of CM and is highly allergenic[1]. ↓ Levels of phenylalanine and tyrosine. Newborns have a limited ability to metabolise these due to low levels of necessary enzymes[2]. Taurine present in BM but not CM, added to formulas. Believed to play a major role in membrane stability and may be important in retinal development [2]. Carnitine in BM is more bioavailable than CM or formulas. Breast-fed infants have higher carnitine levels[2].
Carbohydrate	1° CHO is lactose, which facilitates Ca and Fe absorption and promotes intestinal colonisation with *Lactobacillus bifidus*[1,2]. Lactose is well tolerated by breast-fed infants, whereas formula fed infants often become intolerant to lactose[2].
Fat	Most variable of milk constituents[3,4]. Circadian fluctuations in concentration as well as variations within feeds. Increased fat content in hindmilk believed to act as a satiety regulator[1]. ↑ Concentration of long-chain polyunsaturated fatty acids, in particular arachidonic acid (AA) and docosahexaenoic acids (DHA) which are important in brain development and myelinisation[3]. Studies suggest that the availability of DHA is related to the development of visual function and that of AA to body growth[4]. ↑ Content of the PUFAs arachidonic and linoleic acids which are required for prostaglandin synthesis. Prostaglandins affect a variety of physiological functions which contribute to host defence mechanisms[1]. Presence of a non-specific enzyme (not present in CM) to digest the fat[1].

BM= Breast milk; CM = Cow's milk
Source [1] Akre, 1989; [2] Lawrence, 1994; [3] Koletzko et al., 1992; [4] Wagner et al., 1996

Fat cont.	Rich in cholesterol, the importance of which is not fully understood[1,2]. However, animals given high levels of cholesterol early in life were better able to cope with cholesterol and maintain a lower cholesterol level[2].
Electrolytes and minerals	↓ Minerals concentrations e.g. ↓ sodium, better suited to the infant's metabolic capabilities[1]. ↑ Bioavailability of Fe[1,2]. ↓ Ca levels but much higher bioavailability[1,2]. ↑ Levels of copper, cobalt and selenium compared with CM[1].

BM= Breast milk; CM = Cow's milk
Source [1] Akre, 1989; [2] Lawrence, 1994; [3] Koletzko et al., 1992; [4] Wagner et al., 1996

Human milk is a unique species-specific nutritive fluid (Wagner et al. 1996) and infant formula manufacturers endeavour to adapt their product to mimic breast milk as closely as possible. However, it is now recognised that the ability of infant formulas to provide adequate levels of nutrients cannot be predicted from their compositional analysis alone, and that growth by itself is not a sufficiently sensitive indicator of all possible outcomes due to deficiency or excess (Akre 1989).

2.1.2 Immunological properties of breast milk

It has been known for a long time that infants who are breast-fed contract fewer infections than those who are given formula. Until recently, it was presumed that breast-fed infants fared better simply because milk supplied directly from the breast is free from bacteria (Newman 1995). However, breast milk contains a variety of substances which actively complement the developing abilities of the infant, by aiding digestion and providing host defence (Lawrence 1994). It not only provides unique protection against infections (Howie et al. 1990; Beaudry et al. 1995) but it also stimulates the development of the infant's own immune system (Akre 1989).

Human milk contains immunoglobulin secretory IgA (sIgA) which is present in substantial amounts throughout the first year (Lawrence 1994; Newman 1995). The sIgA antibodies found in breast milk protect against a wide spectrum of bacterial, viral, parasitic, fungal and food antigens, including *Escherichia coli* O and K, *Shigella* and *Salmonella* antigens (Forsyth 1992; Hanson 1993). In effect the neonate is passively immunised by its mother's milk (Wagner et al. 1996). In addition, the antibodies delivered to the infant through the mother's milk ignore useful bacteria normally found in the gut. This normal gut flora serves to crowd out the growth of harmful organisms, thus providing another avenue of resistance (Newman 1995).

As well as these antibodies, breast milk contains a number of components which exert an anti-microbial activity. Lactoferrin is a milk-specific iron binding glycoprotein which plays an essential role in iron absorption in the intestine. It exerts bacteriostatic property by competing for and binding iron which is a growth factor for most aerobic gram negative bacteria (Forsyth 1992; Hanson 1993). It is especially effective at inhibiting the proliferation of organisms causing serious illness in infants, including *Staphylococcus aureus*. Lactoferrin also disrupts the process by which bacteria digest carbohydrates, further limiting their growth (Newman 1995). Lysozyme is another non-specific protective factor which attacks the cell walls of gram positive bacteria (Forsyth 1992; Hanson 1993). Human milk also exhibits anti-inflammatory properties (Akre 1989; Hanson 1993; Newman 1995). Thus breast-feeding both directly protects against infection and prevents or decreases some of the symptoms (Hanson 1993).

Breast-feeding, especially early exclusive breast-feeding, can efficiently decrease disease and death in infants. Mortality in infants is highest during the first few months of life and one of the major causes of death during this time is diarrhoea (Hanson et al. 1994). Victora et al. (1987) reported that in

the first two months of life the risk of dying from diarrhoea is 23.5 times higher among non-breast-fed compared to exclusively breast-fed infants.

While the immunological benefits of breast milk are most obvious in developing countries, where risk of exposure to infection and subsequent infant mortality rates are high, they are no less real among relatively affluent populations (Akre 1989; Cunningham et al. 1991). Howie et al. (1990) in a Scottish study showed that after adjusting for confounding variables, infants who were breast-fed for 13 weeks or more had significantly less gastro-intestinal illness than those that were bottle-fed from birth. By contrast infants that were breast-fed for less than 13 weeks had rates of gastro-intestinal illness similar to those observed in bottle-fed infants. They concluded from their data that breast-feeding during the first 13 weeks of life confers protection against gastro-intestinal illness that persists beyond the period of the breast-feeding itself. Beaudry et al (1995) reported a similar protective effect of breast-feeding against gastro-intestinal illness amongst Canadian infants. Both Howie et al. (1990) and Beaudry et al. (1995) demonstrated a protective effect of breast-feeding against respiratory illness.

2.1.3 Other health benefits of breast-feeding

Until recently it was generally considered that the benefits of breast-feeding were evident only amongst children in less technically developed countries and that these benefits were limited to the prevention of diarrhoea and acute infections during infancy, and there are no lasting benefits (Cunningham and Segree 1990). However, recent research suggests that the benefits of breast-feeding are both more long-lasting and far reaching.

It is popularly believed that breast-feeding offers protection against allergic disorders. However, the scientific evidence is conflicting. Kramer (1988) reviewed 22 studies of atopic eczema published between 1983 and 1986 and applied strict biologic and methodologic standards in an attempt to resolve the controversy surrounding the prophylactic benefit of breast-feeding. He

concluded that the inconsistent findings, even amongst the better designed studies, prevented any firm inferences and urged that future studies should improve both the biologic and methodologic aspects of their design and analysis. More recently, Saarinen and Kajosaari (1995) in a 17 year prospective follow-up study demonstrated that breast-feeding exerted a prophylactic effect against atopic disease - including atopic eczema, food allergy and respiratory allergy - throughout childhood and adolescence. Similarly, Halken et al. (1992) demonstrated that a dietary program which included breast-feeding for at least six months appeared to reduce the prevalence of atopic symptoms amongst high-risk infants for the first 18 months of life.

There is considerable evidence to suggest that breast-feeding may exert a protective effect against the development of type 1 diabetes mellitus. Gerstein (1994) analysed 60 citations pertaining to the relationship between cow's milk and diabetes. He showed that in case-control studies, patients with type 1 diabetes were more likely to have been breast-fed for less than three months (overall OR 1.43; $CI_{95\%}$ 1.15-1.77) and to have been exposed to cow's milk before four months (overall OR 1.63; $CI_{95\%}$ 1.22-2.17). Furthermore, he argued that these calculated ORs would actually underestimate the magnitude of the effect as only two studies determined ORs for exclusive breast-feeding. In addition, control subjects were usually drawn from the general population, most of whom would not be genetically susceptible to type I diabetes and unlikely to develop diabetes even if they were exposed to cow's milk.

Further epidemiologic studies have demonstrated a link between formula feeding and increased risk of SIDS (Ford et al. 1993), inflammatory bowel disease (Calkins and Mendeloff 1986), coeliac disease (Kelly et al. 1989), multiple sclerosis (Piscane et al. 1994), pyloric stenosis (Piscane et al. 1996) and some childhood cancers (Davis et al. 1988). Several independent investigations have indicated that breast-fed infants may gain developmental

and intellectual advantages over formula-fed infants (Morrow-Tlucak et al. 1988; Lucas et al. 1992; Rogan and Gladen 1993).

There are also benefits for maternal health with lactation exerting some protective effect against premenopausal breast (Thomas and Noonan 1993; Katsouyanni et al. 1996) and ovarian cancer (Siskind et al. 1997) and hip fracture in old age (Cumming and Klineberg 1993). Also, there is evidence that breast-feeding leads to significantly faster loss of body weight and reduction in hip circumference than does formula feeding (Kramer et al. 1993).

2.1.4 Growth of breast-fed infants

The growth patterns of breast-fed infants differ from those of bottle-fed infants (Hitchock and Coy 1989; Dewey et al. 1993; Oski 1993). Hitchcock and Coy (1989) in a pooled study of Western Australian and Tasmania infants demonstrated that infants who were artificially-fed or breast-fed for fewer than three months gained significantly more weight between their birth and 12 months of age than did those infants who were breast-fed to six months of age or to 12 months of age. Hitchcock and Coy compared the growth of infants from their 1984 study with the results of a survey conducted in 1933 when the practice of breast-feeding predominated and another survey conducted in 1963-1965 when infants mostly were fed artificially with cow's milk-based formulas. Comparison of the three surveys revealed that a very small difference occurred in the weight increments of the infants in the 1933 and 1984 surveys in the first three months. However, a very large difference in their weight gains occurred in the first six months in the infants in the 1933 and 1984 surveys compared with those in the 1964 survey, and particularly in the first three months.

Dewey et al. (1995) conducted a pooled analysis of infant growth data from seven USA, Canadian and European growth studies. They compared infant growth patterns with the WHO/CDC reference data but questioned the

validity of the reference data for assessing growth of breast-fed infants because: 1) very few infants were breast-fed for more than three months; 2) measurements were too infrequent for adequate characterisation of the pattern of growth; and 3) the reference group was not a representative sample.

Dewey et al. (1995) demonstrated that infants breast-fed for at least 12 months grew more rapidly for the first 2 months and less rapidly (particularly in weight) from 3 to 12 months when compared with the WHO/CDC reference data. Hitchcock and Coy (1989) concluded from the results of their Australian studies that artificially-fed infants are relatively overfed compared with those who are breast-fed. However, Dewey et al. suggest that the opposite interpretation is often made and that the deceleration of growth experienced by breast-fed infants may be inappropriately interpreted as growth faltering, even if the infant is healthy and thriving. They contend that as a consequence mothers may be counselled that their breast milk production is inadequate and that complementary foods should be added, thus undermining the confidence of the mother.

2.1.5 Contraceptive effect of breast-feeding

It is well documented that breast-feeding exerts a natural contraceptive effect (Howie 1993) and for millions of couples in the world wanting no more children, it is said to be the only method presently available (Hanson 1993). Hormonal mechanisms are initiated by the stimulus of sucking on the nipple during breast-feeding which prevent ovulation and conception (Thapa et al. 1988; Howie 1993). Rosa in 1973 (cited in Hanson, 1994) estimated that at the time breast-feeding in developing countries prevented more pregnancies than all forms of artificial contraception put together.

Through its contraceptive effect, exclusive and prolonged breast-feeding increases the interval between births, which effectively reduces infant mortality. A short interval between births carries an increased risk of death for the siblings (Thapa et al. 1988). A birth interval of less than 18 months carries

a risk of dying which is three times greater than that of an interval of more than 42 months (Carlaw, cited Hanson 1993).

2.1.6 Economic benefits of breast-feeding

Breast-feeding has economic benefits both at the household and national level. At the household level it costs significantly more to buy the formula and paraphernalia (bottles and teats etc.) required to bottle-feed than it does to purchase the extra food required by a breast-feeding woman to meet the additional nutritional demands of lactation. This is particularly important in developing countries where the cost of bottle-feeding can account for a significant proportion of the household income. Melville (1991) calculated the monthly costs of artificially feeding a three month old infant in Jamaica in 1991. The figure of $US 43.30 amounted to 90% of the monthly salary of a minimum wage earner and 25% of a higher income earner, such as a teacher. When compared with a basic food basket, artificial feeding on a monthly food basis cost as much as feeding a family of five.

On a macro-economic level developing countries are paying millions of dollars to purchase infant formula to replace a natural resource, breast milk, which is virtually free. Declining breast-feeding in a country represents a loss of a specialised food, which has to be replaced usually with imported infant cow's milk-based formula, with a loss of foreign currency (Jelliffe 1976). Even in affluent countries the economic costs of bottle-feeding are high. Internal research conducted by Kaiser Permanente, a major health maintenance organisation in the USA, calculated the savings of breast-feeding a baby for the first six months of life. Infants who were breast-fed for a minimum of six months experienced $US 1,435.00 less health care claims than formula fed infants (Kaiser Permanente, 1997. http://www.greatstar.com.lois.bfh.html).

2.2 Breast-feeding trends

Infant feeding practices remained relatively unchanged for centuries until the industrial revolution in Europe (Fildes 1991). Prior to this period, almost all children were breast-fed, either by their mother or a wet nurse. Artificial feeding was uncommon, generally considered to be unsafe, and was confined to those instances when prematurity or birth defects made suckling impossible (Fildes 1986). In those cases when artificial feeding was attempted, the outcome was usually fatal due to the prevailing conditions of poor hygiene and limited access to nutritious substitutes for breast milk (Vahlquist 1975; Brodie 1991). The industrial revolution had its origins in England in the mid-18th century and by the end of the first world war, the majority of people living in Europe, North America and Australia were living in an industrialised society. According to Fildes (1991) "the immense changes that occurred during this transition had a significant influence on infant feeding practices".

A number of events related to industrialisation conspired to bring about a reduction in the number of women who initiated breast-feeding and the duration of breast-feeding. There was a large population shift from rural communities to towns and cities. In place of cottage-based industries, both men and women worked for long hours away from home. As a result, differences in infant feeding practices in rural and urban areas began to emerge. In rural communities, women continued to breast-feed as their mothers had done, and for a similar duration. However, in the manufacturing towns and cities, women were more likely to supplement their breast milk with other foods early on, or to hand-feed (Fildes 1986; Fildes 1991).

Hitchcock (1989; 1989) reviewed 200 years of infant feeding practices in Australia - from colonisation in 1788 up to 1988. Up until the first few decades of the 20th century, most Australian mothers expected to breast-feed, and the literature of the day encouraged that expectation, and promoted breast-feeding as a duty. According to Hitchcock (1989) it is not possible to

pinpoint when Australia began to mimic other industrialised countries and the popularity and practice of breast-feeding declined. She cites Victorian figures which indicate that a significant downward trend had already occurred by the early 1940s. In 1944-45, only 66% of infants aged three months were breast-fed and 54% aged six months. This declining trend in the incidence of breast-feeding and in the duration of breast-feeding continued in Victoria, and in other states, throughout the 1950s and 1960s.

2.2.1 The decline and resurgence in breast-feeding in industrialised countries

The rapid decline in breast-feeding that occurred in industrialised countries during the 1950s and 1960s prompted a number of studies to investigate breast-feeding rates both in Australia and other Western countries. While many of the studies are flawed because of problems in their design and methodology, the results nevertheless, provide a picture of breast-feeding trends since the 1960s.

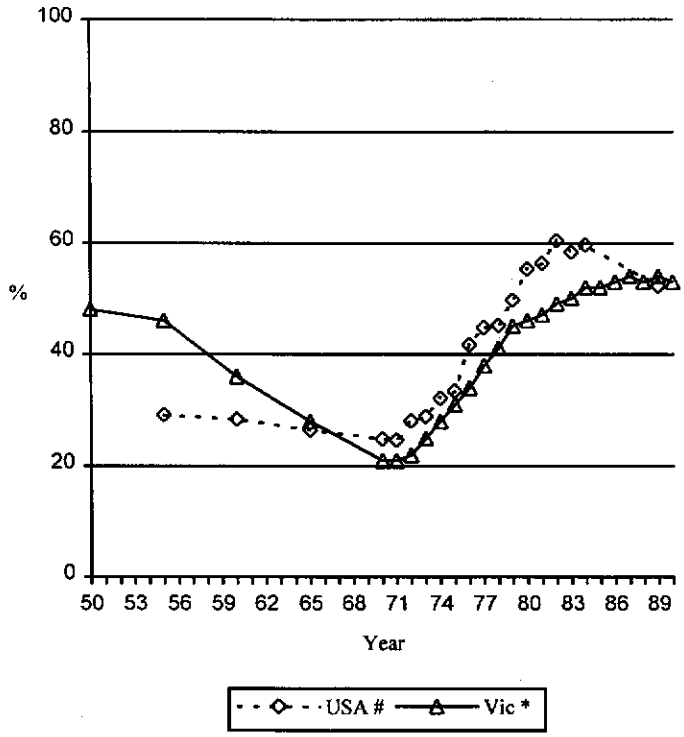
The decline, and subsequent resurgence, in breast-feeding that occurred in Western countries during the second half of this century is best illustrated with data collected in the USA by Ross Laboratories (Martinez and Nalezienski 1979; Martinez et al. 1981 ; Martinez and Krieger 1985; Ryan et al. 1991) The Ross Laboratories Mothers' Survey has been conducted annually since 1955 and is a large, national, mail survey designed to determine patterns of infant feeding to six months of age. Each quarter, questionnaires are mailed to a large representative sample of mothers when their infants are six months old. The sample is drawn from a list of births that represents 70% to 82% of all new mothers in the USA. Over time the response rate has varied between 46 and 60%.

These studies have a number of limitations, in particular less than 50% of newborns are represented and a disproportionate number of those not represented are children of poorly educated and disadvantaged mothers

(Hendershot 1984; Fomon 1987). These limitations could result in the national breast-feeding estimates being artificially inflated due to the over-representation of well educated women, a group known to have the highest breast-feeding rates. However, despite these limitations, the data correlate well with other national data (Forman et al. 1985; Ryan et al. 1991) and provide a unique and useful picture of breast-feeding trends over time.

The results of the studies show that from 1955 there was a progressive decline in breast-feeding, followed by a resurgence in its incidence through 1982 (Figure 2.1) (Martinez and Krieger 1985). In the USA from 1971 through 1978, breast-feeding initiation virtually doubled from 24.7% to 46.6%. At the same time duration increased and at five to six months, the incidence of breast-feeding almost quadrupled from 5.5% in 1971 to 20.5% in 1978 (Martinez and Nalezienski 1979). From 1982 through 1984 these increases continued but at a markedly reduced level (Martinez and Krieger 1985). McNally (1985) reported a similar trend for Canada, where breast-feeding initiation increased from 38% in 1963 to 75% in 1982 and the number of infants being breast-fed at six months of age increased from 7% to 31% over the same time period.

Figure 2.1: Trends in the percentage of women breast-feeding - USA and Victoria 1950-1990



Initiated breast-feeding * Breast-feeding at 3 months

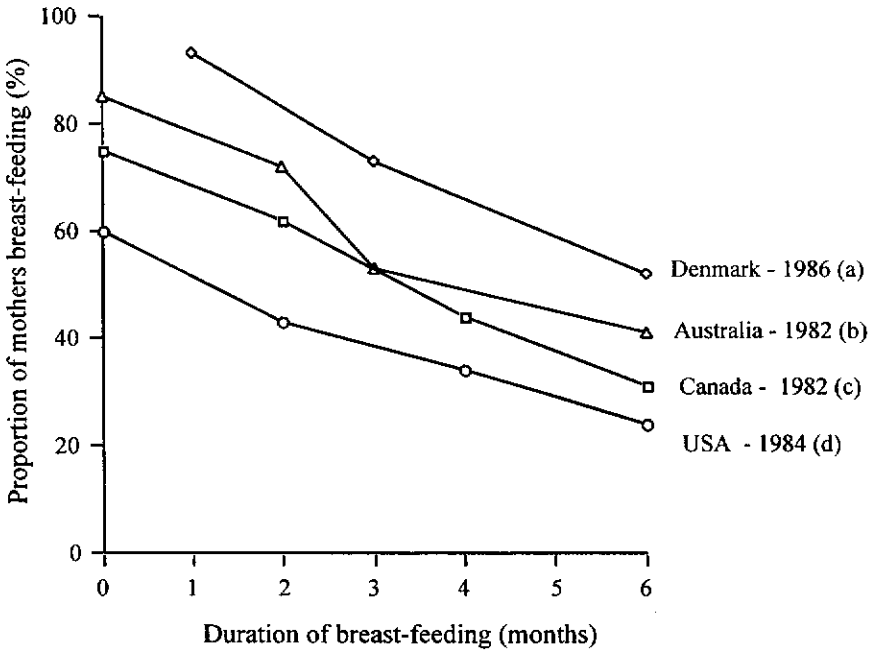
Source: Martinez and Nalesienski 1979; Martinex and Krieger 1985; Victorian Department of Community Services and Health

Data collected annually by the Victoria Department of Community Services and Health reveal a similar pattern in breast-feeding over this period (Figure 2.1). The proportion of infants breast at three months fell from 48% in 1950 to a low of 21% in 1970. Thereafter breast-feeding rates at three months increased steadily until plateauing at around 54% in 1987. These trends were mirrored in other Australian States. In 1984-85, a joint survey of breast-feeding practices in Western Australia and Tasmania was conducted by Hitchcock and Coy (1988). They compared their results with the results of state surveys conducted in the 1970s and early 1980s. In 1969, 59% of Tasmanian mothers were breast-feeding on hospital discharge, and in 1972 fewer than 52% of Perth mothers were doing so. These figures were much lower than the corresponding rates of 72% in Tasmania and 82% in Western Australia reported for 1979-80. By 1984-85 these rates had further increased to 81% in Tasmania and 86% in Western Australia.

In 1982, at the request of the World Heath Organisation (WHO), data from a variety of sources were collected and used by the then Commonwealth Department of Health to provide a picture of breast-feeding in Australia. Results of the survey indicated that just over 85% of mothers were breast-feeding at discharge from hospital. This figure is a national average and in two states - Western Australia and Northern Territory - the incidence was considerably higher, being between 95% and 97% respectively. Across the nation between 54% and 55 % of all mothers were nursing their infants at three months of age, with 40-42 % of mothers still breast-feeding at 6 months (Palmer 1985).

At this time, breast-feeding rates in Australia were appreciably higher than North American and UK rates, but not quite as high as those of Scandinavian countries (Figure 2.2). In the USA, a national survey in 1984 found that 61% of women were breast-feeding at discharge from hospital (Martinez and Krieger 1985), compared with 67% of a group of English women in 1980 (Gregg 1989). In Canada in 1982, 75% of mothers initiated breast-feeding, which is higher than for the USA but not as high as Australian rates (McNally et al. 1985). Australian breast-feeding rates at three months, averaging 54%, (Palmer 1985) were also higher than the corresponding rates for the USA of 37% at three to four months in 1984 (Martinez and Krieger 1985) and 44% in Canada in 1982 (McNally et al. 1985). Breast-feeding rates in Australia at six months were 41% in 1982, compared with 28% in the USA in 1984 and 31% in Canada in 1982.

Figure 2.2: Comparison of breast-feeding rates amongst selected Western countries in the mid- to late 1980s.



[a] Vestermark (1991) [b] Palmer (1985) [c] McNally (1985)

[d] Martinez (1985)

A recent study in Scotland revealed alarmingly low breast-feeding initiation figures with only 35.6% of infants being breast-fed at seven days of age. The prevalence was highest in Shetland (59.1%) but was less than 8% in some postcode districts of cities (Ferguson et al. 1994). Low initiation rates have also been reported by Lowry and Lillis (1993) for the West of Ireland where only 36% of mothers initiated breast-feeding in hospital. By discharge, 6% of mothers had changed to bottle feeding and at five months fewer than 10% of women were still breast-feeding.

In Scandinavian countries initiation of breast-feeding is virtually universal. Nevertheless, while mean duration is higher than for other Western countries, only 50% of infants continue to be breast-fed at six months of age (Weile et al. 1990; Vestermark et al. 1991; Michaelsen et al. 1994).

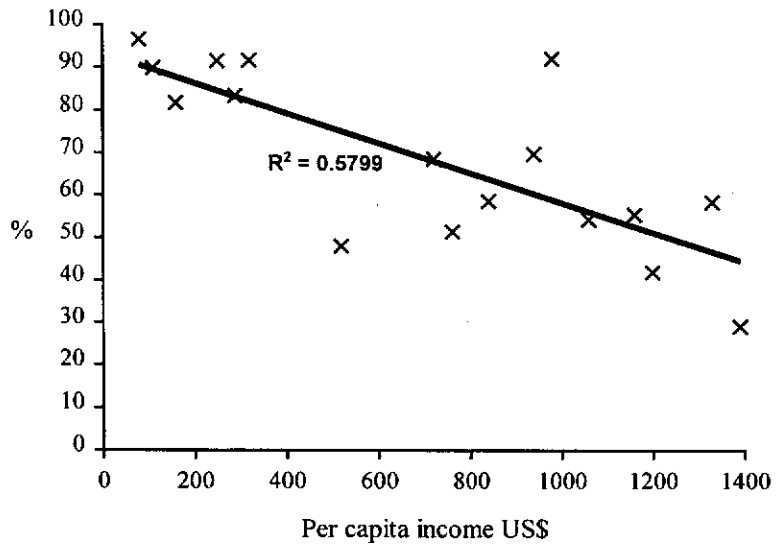
Outside of Scandinavia some of the highest breast-feeding rates have been reported for New Zealand. Ford et al. (1995) reported that 90.7% of women in Canterbury breast-fed on discharge from hospital and at 6 months 70% of mothers were still giving some breast milk to their infants. Essex et al. (1995) in a large national survey found that at birth 93.8% of infants were exclusively breast-fed, with 56% continuing to be at least partially breast-fed at 6 months.

2.2.2 Trends in developing countries

The incidence and duration of breast-feeding are generally higher amongst developing countries. However, in the 1970s, at the same time that breast-feeding rates were increasing in industrialised countries, they began to decline in a number of less developed countries. The decline in breast-feeding corresponded with periods of increased modernisation. In Puerto Rico the proportion of children who had ever been breast-fed dropped from 59% before 1960 (mean duration = 7.8 months) to 25% for infants born from 1970 to 1974 (mean duration = 4.9) (Becerra and Smith 1990). Declines in the initiation and/or the duration of breast-feeding were also noted for Jamaica (Cunningham and Segree 1990), the Philippines (Williamson 1990), the United Arab Emirates (Shahraban et al. 1991) and Botswana (Omondi et al. 1990).

Popkin et al. (1982) reported the proportion of infants breast-fed at six months and the per capita income ($US) for 17 low-income countries during the mid- to late-1970s. When these figures are plotted against each other an inverse association between breast-feeding duration and per capita income is apparent (Figure 2.3). This finding illustrates the negative impact that modernisation exerts on breast-feeding in developing countries.

Figure 2.3: Percentage of women breast-feeding at six months in 17 low-income countries by per capita income



Source: Popkin et al. 1982

This finding is consistent with a more recent report by Perez-Escamilla (1994) who investigated the impact of urbanisation on breast-feeding duration in Africa and the Latin American and Caribbean Region. He demonstrated an inverse relationship between degree of urbanisation and breast-feeding duration. A 10% increase in urbanisation was associated with a 3.4 month decrease in breast-feeding duration in the Latin America and the Caribbean region and 1.4 month decrease in Africa.

While there is evidence to suggest a decline in breast-feeding in some developing countries, for most of Asia and Africa, breast-feeding remains virtually universal during at least the first six months. Earlier weaning is common in Latin America where, overall, just over 51% of infants are breast-fed at six months (Popkin et al. 1982; Perez-Escamilla 1994). In those countries which experienced a decline, the decrease in breast-feeding incidence and duration was most apparent among urban, better-educated and higher income groups (Jain and Bongaarts 1981; Cunningham and Segree 1990; Williamson 1990). It was the older, rural women with little or no schooling who were more likely to initiate breast-feeding and nurse their

infants for longer (Jain and Bongaarts 1981; Omondi et al. 1990; Oheneba-Sakyi and Takyi 1991; Shahraban et al. 1991).

2..2.3 Recent trends

After peaking in the mid-1980s, it would appear that breast-feeding rates are declining in some industrialised countries. In the USA, during the period 1984 to 1989, the breast-feeding initiation rate declined approximately 13% (from 59.7% to 52.2%), and there was a 24% decline in the rate of breast-feeding at six months of age (from 23.8% to 18.1%). The decline in breast-feeding was seen across all groups studied but was greater in some groups than in others. Older, white women with some tertiary education were most likely to initiate breast-feeding, while younger, low-income, black women with no more than high school education were less likely to initiate breast-feeding or to be nursing when their children were 6 months of age (Ryan et al. 1991). An earlier English study reported a similar rapid and progressive decline in intention to breast-feed and in the number of mothers fully breast-feeding at one month. The trend was most apparent among those women whose education did not extend beyond the age of 18, and among Asian mothers (Emery et al. 1990).

A national study conducted in Great Britain in 1990 (White et al. 1992) indicated that there was no significant change in the incidence of breast-feeding in Great Britain since 1980. However, the authors did note that there were differences in the demographic characteristics of women surveyed in 1990 and 1985, with more of them coming from subgroups with a higher rate of breast-feeding, older mothers and the better educated. There had been a slight fall in the incidence of breast-feeding amongst women who had left school before the age of 18 and mother of first babies who were under the age of thirty when they gave birth.

Analysis of breast-feeding data from the 1989-90 National Health Survey suggests a similar decline in the initiation and duration rates for

Australia(Glover and Woollacott 1992). In this survey 77% of women with at least one child under the age of five reported having ever breast-fed. There were marked regional differences in the percentage of women who reported not breast-feeding at least one child, ranging from a high of 27.1% in NSW to 15.6% in Western Australia.

While these results are lower than those reported in the 1983 National Breast-feeding Survey (Palmer 1985) a number of recent regional surveys suggest that breast-feeding has remained constant over the last decade or so. A study of 191 primiparous women in Newcastle in NSW, revealed that 87% of mothers were breast-feeding on discharge from hospital. Four months later, 49% of mothers were exclusively breast-feeding their infants and a further 12% were using a combination of breast and bottle-feeding (Redman et al. 1992). A study conducted in Western Australia to investigate the association of breast-feeding with SIDS reported 96% of primiparous and 92% of multiparous women initiation breast-feeding (Callaghan 1994). At three months, 65% of primiparous and 62% of multiparous women were still breast-feeding. A more recent study of infants in Toowoomba, Queensland (Landers et al. 1995) demonstrated that on hospital discharge 88% of women were breast-feeding, at three months 51% of infants were breast-fed and at six months 40% of infants continued to be breast-fed.

The disparity between the results of the National Health Survey and these regional surveys may be explained by a number of short comings in the questions used in the National Health Survey which raise some doubts as to the reliability of the results (Lund-Adams and Heywood 1994). The results reported represent the number of women who had breast-fed at least one child under the age of five years and not necessarily the number of infants aged five years and under who had been breast-fed. The definition of breast-feeding was unclear so that the number of children who had been fully breast-fed and partially breast-fed could not be calculated. Women who had more than one child aged five years or under had their breast-feeding counted more

than once. Lund Adams and Haywood (1994) contend that if this group had a particular breast-feeding pattern that the calculated proportions could be distorted.

2.2.4 Reasons for changes

The marked decline in breast-feeding experienced in the 1950s and 1960s has been attributed to a variety of contributing factors. There is consensus in the literature that much of the blame should be placed on the shoulders of health professionals - doctors, nurses, midwives and auxiliaries - who according to Vahlquist (1975) were "passive spectators of the development, or at times even active promoters of early introduction of artificial feeding". Smibert (1978) suggested that this was not surprising given that, at the time, most obstetricians were males and the majority of nurses in obstetric hospitals not yet married, neither having first hand knowledge of breast-feeding. Thus limiting the opportunities for mothers to learn in hospital the art of breast-feeding which was traditionally handed down from mother to daughter or from older sister to younger sister.

Millard (1990, p.218) contends that the move away from home births experienced in the early part of this century "eroded the position of midwives and lay women as advisors to new mothers, while the hospital has become the home of early motherhood, emphasising reliance on medical professionals for breast-feeding advice". While the paediatric literature recommended breast-feeding throughout the 20th century, these general recommendations were undermined by hospital regimens, that seemed to be misinformed and were arranged to fit artificial feeding (Millard 1990). Regimens such as scheduled feeding originated in the routines of hospital nurseries, where work is organised on schedules and efficiency in use of time is emphasised (Mulford 1995). Millard (1990) argues that regimens such as these probably tended to lead to insufficient breast milk and increased infant hunger and crying, causing a general sense of inadequacy among mothers and indirectly promoting bottle-feeding, despite biomedical and maternal goals to the contrary.

The heavy commercial promotion of formula feeding probably also contributed to the discouragement of breast-feeding (Hirschman and Butler 1981). With the advent of artificial feeding technology, infant feeding began to be viewed as a science (Mulford 1995). The introduction of National Dried Milk undoubtedly contributed greatly to the decline in breast-feeding after its appearance in the UK in the mid-1940s (Forsyth 1992). According to Jelliffe (1976) "infant feeding came to be considered almost as an engineering exercise, with the child refuelled with mathematically calculated amounts of known nutrients delivered mechanically from a feeding bottle".

Thus the attitudes and actions of health professionals, coupled with the tendency of women everywhere to doubt the adequacy of their breast milk (Savage 1990), resulted in a continual decline in breast-feeding until the downward trend appeared to bottom out some time in the late 1960s, early 1970s. At which time, breast-feeding rates began to increase and continued increasing into the 1980s. This incline in breast-feeding rates has been primarily attributed to emerging knowledge at the time of the unique nutritional and immunological benefits of breast milk. However, without the efforts of support groups, such as the Nursing Mothers Association in Australia and the La Leche League in North America, in promoting the benefits of breast-feeding and providing practical support for those women who wished to do so, it is unlikely that the reversal of the decline in breast-feeding observed in the 1980s would have been as marked or as rapid (Hartmann et al. 1982; Smibert 1988).

Since this time the promotion and support of breast-feeding has become the focus of many international governments and non-government organisations. In particular two WHO initiatives, the WHO International Code of Marketing of Breast Milk Substitutes and the WHO Baby Friendly Hospital Initiative, have been instrumental in promoting breast-feeding in Western and rapidly

industrialising countries and in preventing the erosion of breast-feeding practices in traditional societies.

2.3 Factors associated with the initiation and duration of breast-feeding.

The literature suggests that successful breast-feeding is dependent on multiple factors relating to the mother, infant and to the supportive environment. These factors be categorised as non-modifiable and modifiable (Gray-Donald et al. 1985). Non-modifiable factors include ethnic background, years of education, age, income and parity. Potentially modifiable factors include support by partner, family and friends, the health care system, the work place environment, antenatal instruction and lactation education. For the purpose of this review factors associated with breast-feeding have been broadly categorised as demographic and socio-economic, psychosocial and cultural, biomedical and health-service related.

2..3.1 Demographic factors

A variety of demographic factors, such as age, education, social class, income, working status and ethnicity, have been associated with the initiation and duration of breast-feeding.

Age

Age has consistently been associated with both breast-feeding initiation and duration in Australia (Rutishauser and Carlin 1992) and in other Western countries (Ford and Labbok 1990; Michaelsen et al. 1994; Nolan and Goel 1995; Quarles et al. 1995; Piper and Parks 1996). In general, even after controlling for other potentially confounding variables, older mothers (> 25 years) are more likely to choose to breast-feed (Samuels et al. 1985; Birenbaum et al. 1989; Ford and Labbok 1990; Ford et al. 1994; Nolan and Goel 1995) and to breast-feed for longer periods (Samuels et al. 1985; Ford and Labbok 1990; Rutishauser and Carlin 1992; Michaelsen et al. 1994;

Nolan and Goel 1995; Quarles et al. 1995; Piper and Parks 1996), than younger mothers. Although, Hunkeler et al. (1994) in a recent study of Swiss mothers found that younger mothers (20-25 yrs) were significantly more likely to breast-feed than older mothers (> 26 yrs) and MacGowan et al. in a US study (1991) found no association between the initiation of breast-feeding and maternal age.

It has been suggested that the rapid resurgence in breast-feeding rates observed in the late-1970s and early-1980s can be explained in part by a rise in maternal age at first birth. However, Starbird (1991) *compared the determinants of breast-feeding initiation of firstborn children in two periods, 1960-69 and 1970-79, and found that increased maternal age at first birth accounted for less than one percentage point of the increase in breast-feeding initiation which occurred over the period studied.*

Education

Many studies of Western women have identified a consistent and strong association between educational level attained and the incidence and duration of breast-feeding. In general, in studies using multivariate analysis, the higher the education level attained by the mother, the more likely they are to choose to breast-feed (Birenbaum et al. 1989; Ford and Labbok 1990; Bee et al. 1991; MacGowan et al. 1991; Salt et al. 1994; Nolan and Goel 1995) and the longer the duration of breast-feeding (Ford and Labbok 1990; Michaelsen et al. 1994; Salt et al. 1994; Lawson and Tulloch 1995; Nolan and Goel 1995; Quarles et al. 1995). However, some investigators have found no association between level of maternal education and either initiation of breast-feeding (Ford et al. 1994) or duration of breast-feeding (Ford et al. 1994; Piper and Parks 1996) after controlling for potentially confounding factors.

Most studies investigating the association of education and breast-feeding rates have reported a positive linear association. However, several investigators (Hirschman and Butler 1981; Rassin et al. 1984; Ever-Hadani et

al. 1994) in studies conducted in the mid- to late-1970s reported a curvi-linear association. They found that more women with little education (< 8 yrs) breast-fed than did mothers with some high school education, although the proportion was not as high as that of women with at least some college education. When plotted, these findings produced a truncated U-shaped or J-shaped curve. Ever-Hadani et al. (1994) suggest that this might be attributed to the "tendency for less educated women to cling to traditional practices on one hand, and the predilection of more educated women to adopt modern Western trends encouraging breast-feeding on the other hand". This curvilinear association has not been noted in studies conducted since breast-feeding rates peaked in Western countries in the mid-1980s.

Marital status

Marital status has frequently been identified as being an important discriminator for the initiation of breast-feeding, both in studies using unvariate (Rassin et al. 1984; Grossman et al. 1990; Buxton et al. 1991; Fitzpatrick et al. 1994) and multivariate (Samuels et al. 1985; Bee et al. 1991; MacGowan et al. 1991; Nolan and Goel 1995) analysis. In all of these studies married women were significantly more likely to have initiated breast-feeding than single women. Nolan and Goel (1995) in a Canadian study found after controlling for confounding factors such as maternal age, level of education, ethnic background and employment status, that single women were only half as likely to initiate breast-feeding as married women (OR=0.57 $CI_{95\%}$ 0.40-0.81).

A negative association between being single and breast-feeding duration has less commonly been noted, either with univariate (Holt and Wolkind 1983; Ford et al. 1994) or multivariate (Samuels et al. 1985; Ford and Labbok 1990) analysis. Several studies using multivariate analysis (Ford et al. 1994; Nolan and Goel 1995; Piper and Parks 1996) have reported no association between marital status and breast-feeding duration. Which suggests that once single

women have initiated breast-feeding they continue to breast-feed for as long as married women.

Numerous studies have reported that a father supportive of breast-feeding plays an important role in the mother's decision to breast-feed (Freed et al. 1992; Giugliani et al. 1994; Littman et al. 1994). MacGowan et al. (1991) suggest that this may partially account for the difference observed between married and unmarried women.

Ethnicity

In the US, major differences in the incidence of breast-feeding are apparent amongst various ethnic groups. After controlling for potentially confounding factors such as maternal age and level of education lower rates of breast-feeding have been found consistently among black and hispanic women when compared with white women (Samuels et al. 1985; Ford and Labbok 1990; Grossman et al. 1990; Ryan et al. 1991). Ryan et al. (1991) in a national US survey conducted in 1989 reported that 58.5% of Anglo-American mothers initiated breast-feeding compared with 48.3% of Mexican American and 23.0% of Black American mothers. Similarly, only 6.4% of Black American mothers were breast-feeding at six months compared with 13.9% of Mexican American and 21.0% of Anglo-American mothers. A more recent study of Southeast Asian immigrants to the USA, reported a breast-feeding initiation rate of only 12.3% (Tuttle and Dewey 1994). Conversely, MacGowan et al. (1991) and Piper and Parks (Piper and Parks 1996) found no significant difference in breast-feeding initiation between white and non-white women after adjusting for other demographic variables such as age and level of maternal education.

Early Australian studies using univariate analysis failed to find a consistent association between ethnicity and breast-feeding rates. Boulton and Flavel (1978), in a South Australian study, found that the ethnic status of mothers, defined as Caucasian Australian, Southern European, or Aborigine, was not

associated with significantly different rates of breast-feeding initiation. However, in a subsequent South Australian study, Boulton and Coote (1979) observed that mothers of Southern European birth breast-fed for shorter duration than mothers from English speaking or other countries.

More recent studies of Southeast Asian migrant women indicate that breast-feeding rates among Vietnamese mothers are lower in Australia than in Vietnam. For instance, in a study conducted in Sydney in the late 1970s, only 40% of recent Vietnamese migrant mothers initiated breast-feeding (Mathews and Manderson 1980), compared with traditional Vietnamese practices, where 80-90% of all women breast-feed for at least the first year of the child's life (Swenson et al. 1993).

There is some evidence to suggest that the breast-feeding rates of migrant and Aboriginal mothers reflect the prevailing social norm. For instance, Reynolds et al. (1988) in a study of Southeast Asian mothers conducted in 1980-81, reported that the incidence of breast-feeding, its duration, and the age at which solids were introduced by immigrant mothers reflected local practices. They observed a breast-feeding initiation rate of 81% amongst Vietnamese mothers, which compared favourably with the state wide figure of 82% reported by Hitchcock et al. (1982). At three months 56% of Vietnamese women were still breast-feeding, compared with 64% of women from the general population. This finding is supported by a later study by Rossiter et al. (1993) who reported a breast-feeding initiation rate of 75% amongst Indochinese women, the majority who had lived in Australia for more than two years. They suggested that the longer Indochinese women reside in Australia, the more likely they are to choose to breast-feed.

Phillips and Dibley (1983) in a study of Perth Aboriginal mothers reported an initiation rate of 82%. This was the same as the rate reported by Hitchcock et al. (1982) in a state wide study of Western Australian infants conducted at roughly the same time. However, urban Aboriginal women did fail to sustain

breast-feeding for as long as the mothers from the general population. By three months postpartum 50% of Aboriginal mothers had stopped breast-feeding compared with 64% of women in the general population who contibued to breast-feed. However, this finding is probably a reflection of socio-economic status, rather than ethnicity. When the sample in the study by Hitchcock et al. was stratified according to socio-economic status, urban Aboriginal women breast-fed for approximately the same length of time as non-Aboriginal women in the lowest of four social classes. This finding is supported by Cox (1981) who found no difference in breast-feeding rates between Aboriginal and low-socio-economic-status Anglo-Australian women. He concluded that ultimately class, not race, was a more important predictor of breast-feeding rates.

In Western Australia, differences in breast-feeding rates have been demonstrated among Aboriginal groups from various locations. Gracey et al. (1983) reported that groups in remote areas tended to continue the traditional pattern of breast-feeding for as long as possible, with 96% of infants still being breast-fed at 12 months. The prevalence of breast-feeding at all ages decreased with increasing urbanisation. Gracey et al. associated this decline with the loss of traditional culture and increasing affluence.

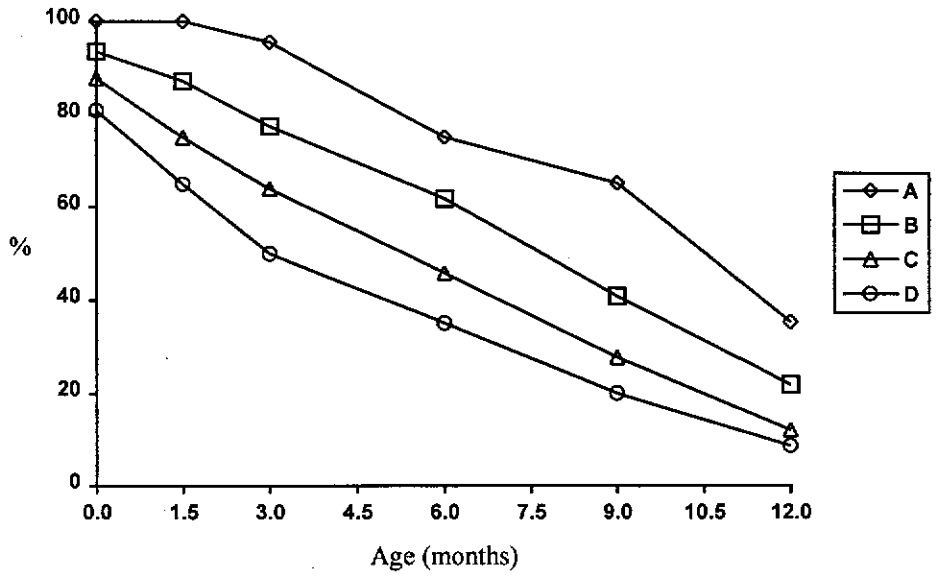
Reasons given for low breast-feeding rates amongst ethnic and immigrant groups include the transition from extended to nuclear families, transition from a rural to an urban environment, an increased interest in Western lifestyles, a need to work or look for work and the availability of infant formula (James et al. 1994).

Social class

Many investigators have documented the relationship between social class and breast-feeding success. In Australia, breast-feeding initiation and duration rates are positively associated with social class (Eaton-Evans et al. 1985; Hitchcock and Coy 1988) and this trend is clearly illustrated in Figure 2.4.

Similar findings have been reported for other Western countries including England (Coles et al. 1978), New Zealand (Msuya et al. 1990), Denmark (Vestermark et al. 1991), Sweden (Persson and Samuelson 1984), Finland (Stahlberg 1985), Switzerland (Hunkeler et al. 1994), Canada (Yeung et al. 1981) and the USA (Ryan et al. 1991).

Figure 2.4: Prevalence of breast-feeding* in relation to social rank #



*Includes full and partial breast-feeding
Based on the Congalton Scale of Occupation Status where A = highest and D = lowest social rank.
Source: Hitchcock and Coy, 1988

A variety of factors may contribute to this trend. It is likely that the factors that result in either failure to initiate, or discontinuation of, breast-feeding in all women, are similar for women in lower socio-economic classes. However, it seems likely that these factors are more pronounced in women in lower-socio-economic classes. There may also be other important factors unique to women of low socio-economic status. Holt and Wolkind (1983) noted that many working class women experienced feelings of disquiet and unease at the thought of breast-feeding. Similarly, Libbus (1992) reported that low-income women were less comfortable with breast-feeding in public than women from a middle-class background. However, Jones (1986) found no association between social class and degree of embarrassment at breast-feeding.

It would appear that the influence of social class on breast-feeding is different for 'modernising' and developing countries. In those countries that have experienced rapid urbanisation and modernisation, breast-feeding is declining, and it is the urban, educated women of higher social class who are leading this shift away from breast-feeding (Cunningham and Segree 1990; Williamson 1990).

Return to employment

Return to employment is often cited as a major reason for the decision to bottle-feed or early cessation of breast-feeding (Simopoulos and Grave 1984; Feinstein et al. 1986). It has been suggested that one of the reasons contributing to the decline in breast-feeding experienced in the 1960s and 1970s was the increasing participation of women in the workforce (Hirschman and Butler 1981). However, the results of studies which investigate the association between employment and breast-feeding rates are inconsistent.

Martinez et al. (1981), in a large, cross-sectional, USA national survey conducted in 1980, interviewed 7 200 new mothers of 8-, 10- and 12-month old infants and found that mothers who were not employed outside the home at the time of the survey were more likely to have initiated breast-feeding than mothers who were employed full-time at the time of the survey. Similarly, breast-feeding of infants at 6 months was highest amongst mothers who were not employed at the time of the survey.

By 1984, the incidence of breast-feeding was higher among employed women than among unemployed women. However, for infants at 5 and 6 months of age, the proportion of unemployed women breast-feeding was higher (Martinez and Krieger 1985). This disparity at six months between mothers not employed and those employed increased from an odds ratio of 1.65 in 1984 to 2.43 in 1989 (Ryan et al. 1991). Conversely, Stahlberg (1985), in a

Finnish study, reported that mothers employed outside of the home had breast-fed their children for a longer time than mothers staying at home.

A recent study by Littman et al. (1994) designed to evaluate specifically the effect of working outside the home, demonstrated that intention to return to work post-partum was not associated with intention to breast-feed. In this study 67.9% of working mothers, compared with 67.2% of those who did not plan to work postpartum, planned to at least partially breast-feed. Similarly Carlson Geilen et al. (1991) in a US study reported that after adjusting for maternal demographic characteristics, there was no association between planning to be employed within the first six months postpartum and initiation of breast-feeding.

The results of a large national study of mothers in England, Wales, Scotland and Northern Ireland (White et al. 1992) indicated that early return to work (6 - 10 weeks postpartum) was not associated with either the initiation or duration of breast-feeding. There was virtually no difference in the duration of breast-feeding between mothers who did not work at all during the first nine months and those who had worked throughout this period.

Conversely, a number of recent studies indicate that mothers who actually return to work early and for more than 20 hours a week wean earlier on average, than other women (Weile et al. 1990; Cronenwett et al. 1992; Piper and Parks 1996). While Carlson Geilen et al. (1991) found no association between intended return to work and initiation of breast-feeding, actually being employed was significantly associated with the early cessation of breast-feeding. Piper and Parks (1996) analysed data from the US 1988 National Maternal-Infant Health Survey and found that women who delayed their return to work until at least six months post-partum were more likely to breast-feed past six months compared to women who returned to work before this time.

It is possible that employment has become a stronger influence in the past decade as the number of women with children either remaining in, or re-entering the workforce increases (Castles 1993). More recent studies in Denmark and the USA provide evidence that return to work has a negative impact on the duration of breast-feeding.(Weile et al. 1990; Cronenwett et al. 1992).

2.3.2 Biomedical.

Parity

The reported association between parity and breast-feeding initiation and duration is inconsistent. Several studies have found no difference between multiparous and primiparous women (Sjolin et al. 1977; Starling et al. 1979; Loughlin et al. 1985; Bee et al. 1991), while others have found that primiparous women are more likely to initiate breast-feeding (Martinez et al. 1981; Forman et al. 1985; McNally et al. 1985; Ford and Labbok 1990). However, multiparous breast-feeders appear to continue for longer (Martinez et al. 1981; McNally et al. 1985) and a major USA national survey reported that breast-feeding duration increased with parity by one-half month per child (Ford and Labbok 1990).

Parity may contribute to increased duration, since a woman's confidence in maternal tasks increases with subsequent pregnancies (Coreil and Murphy 1988). Conversely, the size of her family may adversely affect a woman's decision to continue breast-feeding if she feels under pressure with breast-feeding and is having problems. The demands of caring for her family in addition to problems being experienced with breast-feeding may be sufficient for her to lose determination.

The effect of parity may be confounded by maternal age and ethnic background. For instance, Samuels et al. (1985) found that older, black multiparous women, and younger, white primiparous women, breast-fed for longer than other groups of women. However, when controlled for maternal

age or previous breast-feeding, Feinstein et al. (1986) found no association between parity and breast-feeding duration.

Obstetric performance

A woman's childbirth experience is likely to influence her persistence with breast-feeding. Entwisle et al. (1982) propose that a positive childbirth experience may have favourable effects on early feeding attempts, whereas a negative experience might cause women to become discouraged easily.

> *"'A good birth experience could contribute to the physical stamina a mother needs to undertake breast-feeding. A woman who has undergone a difficult birth may change her mind about breast-feeding or may allow night feedings to be given by hospital personnel so that she can get more rest."'* (p250)

In keeping with this theory, Procianoy et al. (1984) and Samuels et al. (1985) found that women having caesarean births were less likely to breast-feed and to breast-feed for shorter periods than women delivered vaginally. Boulton and Flavel (1978) investigated factors influencing the onset of breast-feeding among South Australian women, and found also that mothers who had undergone either an elective or emergency caesarean, were less likely to initiate breast-feeding than mothers delivering spontaneously.

Likewise, Tamminen et al. (1983) and Mansbach (1991) found that caesarean delivered women were less likely to begin breast-feeding than mothers delivered vaginally. Although, once breast-feeding had begun, type of delivery had no impact on the duration of breast-feeding. Janke (1988) also failed to find an association between method of delivery and breast-feeding duration.

Conversely, Grossman et al. (1990) demonstrated no association between method of delivery and initiation but found more than twice as many vaginally delivered women breast-feeding at eight weeks as compared to

those who had delivered by Caesarean section ($p<.002$). Even more unexpectantly, Grossman et al. (1989) in an earlier retrospective review of records of 2 124 high-risk women delivered from 1976-1985, found that breast-feeding was associated with Caesarean section and bottle feeding with vaginal delivery ($p<.03$).

Caesarean sections appear to interfere with establishment of breast-feeding at the hospital as immediate postpartum breast-feeding and prolonged early contact between the mother delivered by Caesarean section and her baby is more difficult and possibly less likely than if she had been delivered vaginally (Procianoy et al. 1984; Grossman et al. 1989; Mansbach et al. 1991).

Several researchers have investigated the effect of different maternal labour anaesthesia on breast-feeding onset and duration. Wylie and Verber (1994) found that women who had a Cesearan under epidural anaesthesia were twice as likely to be breast-feeding at discharge, compared with women who had delivered under general anesthesia. Lie and Juul (1988) reported a similar finding and, although the difference in breast-feeding initiation rates was not statistically significant, there were significant differences in duration at three and six months.

Righard and Alade (1990) studied the effect of narcotic analgesics and reported that of the 40 infants born to mothers who received pethidine during labour, eight sucked correctly, seven sucked incorrectly and 25 were too drowsy to suck at the breast two hours after birth. Mathews (1989) also investigated the effect of the narcotic analgesic alphaprodine and found that even small doses of this drug, when administered one to three hours prior to delivery, could delay effective feeding by several hours and in some cases days. However, as she did not follow mothers once discharged from hospital, there is no way of knowing what effect this drug had in the long-term on breast-feeding success.

Infant health problems

Infant health problems can have an impact on the initiation and establishment of breast-feeding. Firstly, health problems diagnosed at birth may prevent the early initiation of breast-feeding, often delaying it for 24 hours or more. Secondly, management of health problems may necessitate the separation of the infant from the mother, often for prolonged periods in the case of major health problems. Persson (1985) reported that infants admitted to a paediatric ward during the neonatal period (but not later on in infancy) were breast-fed for a shorter time than other infant. In most cases infants were admitted for adaptation problems and other minor illnesses that did not preclude breast-feeding. However, separation of mother and child at this vulnerable stage had a negative effect on the continuation of breast-feeding.

Similarly, Elander and Lindberg (1984) reported that short-term mother-infant separation as a result of acute, mild illness was associated with decreased duration of breast-feeding, even when infants continue to be breast-fed during the separated period. They observed that only 32% of infants separated from their mother for 1-6 days during the first week of life were being breast-fed at 3 months of age, compared with 72% of infants in the non-separated group. Infant transfer to the special care nursery was a strong predictor of early termination in a Canadian (Ellis and Hewat 1984) and an Australian study (Fahy and Holschier 1988). In the Australian study, only 15% of mothers who were successfully breast-feeding at six weeks had their babies sent to the nursery compared with 63% of those who had failed at six weeks.

Hunkeler et al. (1994) studied a group of 536 newborns admitted to a Swiss neonatal centre. Mothers of infants remained hospitalised in separate private clinics or public hospitals for a duration of usually five to seven days. Initiation of breast-feeding was slightly lower (75%) in the study population than for the general Swiss population (88%). Although, these difference had

disappeared by the second month and the duration of breast-feeding in neonatally ill babies paralleled that in the general Swiss population up to the fourth month, after which time insufficient data on Swiss babies were available. While the initiation rate was lower than the general Swiss population, the rate was higher than that expected by the authors, considering that the babies had been ill and separated from their mothers. They attributed this mainly to encouragement of the nurses in the neonatal unit and of the midwives on the obstetric wards.

Separation of the mother and child due to illness not only implies physical problems which may limit the infant's ability to feed but also restricts the mother's access to her baby for feeding. Early and frequent close contact with the infant is an essential ingredient for the establishment of successful breast-feeding (De Carvalho et al. 1983; Hewat and Ellis 1986; Buxton et al. 1991).

Infant sex

Several studies have found an association between infant gender and breast-feeding rates, although the results are inconsistent. Rao and Kanade (1992) in an Indian study reported that male infants were significantly more likely to be breast-fed and to be breast-fed for longer than females. They also suggested that females were discriminated against and that they were not getting enough weaning food, as evidenced by a higher proportion of female malnourished children.

Conversely, Pande et al. (1997) in a Scandinavian study and Perez-Escamilla et al. (1995) in a study of Latin American women reported that having a male infant was inversely associated with exclusive breast-feeding success even after controlling for birth weight. Perez-Escamilla et al. (1995) offered the possibility that mothers and/or health workers perceive that male infants have higher nutritional needs and should therefore receive non-breast milk fluids and foods earlier than female infants.

Grummer-Strawn (1996) examined breast-feeding data from the late 1980s for 15 developing countries in Africa, Asia and Latin America and found no association between breast-feeding and infant sex. Similarly, Jones (1986) in a study of British women found no association between duration and infant sex.

Breast milk insufficiency

Women everywhere doubt the adequacy of their breastmilk both in terms of quality and quantity. Inadequate milk supply or breast milk insufficiency is the most commonly cited reasons for the early termination of breast-feeding (Loughlin et al. 1985; Feinstein et al. 1986; Hill 1991; Birenbaum et al. 1993; Henly et al. 1995). This may or may not reflect the true reason for cessation of breast-feeding in individual women, as it has been suggested that 'insufficient milk' is given by some mothers as a socially acceptable reason to stop breast-feeding, when a woman decides she no longer wishes to do so (Hitchcock and Coy 1988).

Breast milk insufficiency is in most cases self-diagnosed on the basis of changes in infant behaviour, for example increased fussiness or crying between feeds (Loughlin et al. 1985; Hill 1992; Segura-Millan et al. 1994). Many women interpret this change in behaviour as an indication that they are not satisfying the nutritional needs of their infant. However, such an interpretation is subjective and varies from mother to mother. For instance Hewat and Ellis (1986) reported that those women who breast-fed for shorter periods (<2 months) were likely to interpret infant crying as hunger due to insufficient milk or to interpret a sleepy infant as disinterested in breast-feeding. These same behaviours meant different things to mothers who breast-fed longer (>6 months) - crying meant the infant wanted attention, and sleepiness meant the infant required more sleep.

True milk insufficiency is relatively uncommon with fewer than five per cent of nursing mothers being physiologically incapable of producing sufficient

milk due to inadequate glandular lactation tissue (Loughlin et al. 1985). Henly et al. (1995) reported a relationship between anemia and insufficient milk in 630 first time mothers. Anaemic mothers (haemoglobin < 10 g/dl) reported a higher level of symptomatology associated with insufficient milk and were more frequently classified as having insufficient milk syndrome. The data suggest that anaemia is associated with the development of insufficient milk. Mothers with the syndrome reported a shorter period of full breast-feeding and weaned at an earlier age. However, there was no evidence of a direct impact of anaemia on breast-feeding duration.

While an association between anaemia and maternal report of insufficient milk was apparent, the question remains as to whether these women were behaviourally unable versus physically unable to breast-feed. Henly et al. (1995) postulated two possible scenarios. One behaviourally oriented explanation for the association between anaemia and insufficient milk may be that the fatigue commonly associated with anaemia interferes with a woman's intention to breast-feed; she simply may be too tired to respond to infant feeding cues and requests that the infant be bottle fed by someone else. This would subsequently disrupt the demand-supply relationship between infant and mother that is essential to maintaining an adequate milk supply. Alternatively, there may be some direct physical effect of low haemoglobin or fatigue on milk production.

Smoking

Several studies using univariate analysis have associated smoking with decreased onset and duration of breast-feeding (Yeung et al. 1981; Loughlin et al. 1985). Although this association between smoking and breast-feeding rates may be spurious and merely reflect social status or level of education. For instance, while Stahlberg (1985) found a negative association between the smoking habits of the parents and the duration of breast-feeding, the smoking habits and the socio-economic status and occupation of the parents

were strongly inter-correlated, which possibly explained the association of smoking to breast-feeding in this study.

However, more recent studies using multivariate analysis which controlled for potentially confounding factors such as maternal age, level of education and social class, have shown that smoking is negatively associated with both the initiation (Birenbaum et al. 1989; Ford and Labbok 1990; Ford et al. 1994; Nolan and Goel 1995) and duration (Ford and Labbok 1990; Rutishauser and Carlin 1992; Ford et al. 1994; Nolan and Goel 1995; Piper and Parks 1996; Clements et al. 1997; Horta et al. 1997) of breast-feeding. Horta et al. (1997) in a Brazilian study, after adjustment for confounding, reported that children whose mothers smoked were 1.34 ($CI_{95\%}$ 1.00-1.80) times more likely to not have been breast-fed at 6 months. Furthermore, a clear and significant dose-response pattern was present for the daily number of cigarettes smoked by the mother. Compared with non smokers, mothers smoking 10-19 cigarettes presented an odds ratio of 1.61 ($CI_{95\%}$ 1.00 - 2.61 for breast-feeding for less than 6 months, while the odds ratio for mothers smoking 20 or more cigarettes daily was 1.94 ($CI_{95\%}$ 1.10-3.39). A similar dose response pattern has been noted by other investigators (Ford et al. 1994; Clements et al. 1997).

These results suggest that smoking exerts a physiological effect which detrimentally influences both the establishment and duration of breast-feeding (Widstrom et al. 1991). A probable mechanism proposed by Jannson et al. (1992) is that smoking increases dopamine secretion in the hypothalamus leading to a reduction in prolactin levels, the hormone integral to the stimulation of milk production.

2.3.3 Health-service related factors

Place of delivery

Several researchers investigating breast-feeding trends in 'traditional' societies and modernising countries have identified an association between

place of delivery and feeding method. Becerra and Smith (1990) studied breast-feeding trends in Puerto Rico for the period 1946 through 1982. They found that before 1975, infants delivered at home or in public hospitals were more likely to be breast-fed than were infants delivered at private hospitals. However, this trend was reversed after 1975. During this period a similar association was seen between maternal education and breast-feeding. The authors suggested that as institution of delivery was associated with maternal education and socio-economic status in Puerto Rico, that the effect of place of delivery was probably a proxy for these demographic factors.

Stewart et al. (1991) found also that delivery in a private hospital had a negative effect on breast-feeding among Filipino women. The probability of actually breast-feeding was reduced by an average of 6.2 percentage points for urban mothers and 2.5 percentage points for rural mothers when their infant was delivered in a private facility. They suggested that the finding may have resulted from the "confluence of an array of unmeasured knowledge, attitudes and practices of practitioners in these facilities; alternatively it may relate to the structure of the hospitals or to the socio-economic status of the women using them" (p. 195). However, because the model they used controlled for a variety of demographic factors, they contended that the finding could not be attributed easily to self-selection bias related to the sample who chose private facilities. They identified private hospitals as an important focus for breast-feeding promotion activities.

Cunningham and Segree (1990) investigated differences in hospital practices between rural and urban hospitals in Jamaica, and found that with the exception of antenatal education, hospital practices that encourage breast-feeding were found more often at the rural hospital where there were fewer resources. At the urban hospital, the division of labour between delivery and postpartum nursing staff contributed to delays in the initiation of breast-feeding. Similarly, in this hospital the differing roles of antenatal clinic and maternity staff led to a lack of continuity in education of mothers. They also

found that the availability of formula for use at the discretion of nursing staff contributed to much higher rates of supplemental feedings at the urban compared with the rural hospital.

Similarly, Hofvander and Petros-Barvazian (1978) suggested that hospital routines and the value systems reflected in those routines may influence feeding practices. In a study of Guatemalan women they found that only 6% of all mothers delivered at hospital started breast-feeding within 12 hours of delivery, while 30% of women who delivered at home had established breast-feeding within the first 12 hours. Approximately 20% of the mothers delivered at hospital were provided with free milk samples.

A search of the literature failed to reveal any studies in Western countries where an association between place of delivery and feeding method was either investigated or identified. Although, the influence of various hospital practices on the onset and duration of breast-feeding have been frequently studied.

Early discharge from hospital

When early discharge programs were first introduced in the UK some thirty years ago, anxiety regarding the impact on breast-feeding initiation and duration rates was expressed in an editorial in the British Medical Journal (Editorial 1964). The assumption being that those women not having access to the on-hand support and advice of hospital nursing staff would be less successful in establishing breast-feeding. However, studies to date have failed to demonstrate any negative effect of early discharge on breast-feeding duration.

Waldenström et al. (1987) in a randomly controlled study demonstrated that early hospital discharge had no significant negative effect on either breast-feeding initiation or duration. In fact, more of the multiparous women who participated in the early discharge program were breast-feeding at 6 months

compared with multiparous women who had remained in hospital for an average of 6 days. Similarly, Emery et al. (1990) found that while the intention to breast-feed was similar for both full and short stay mothers, the achievement of long stay mothers was consistently lower than that of short stay mothers. These findings support the theory that hospital routines have a negative effect on breast-feeding duration.

Rooming-in

Practices such as rooming-in have been positively associated with breast-feeding initiation. Samuels (1985) found that women who chose to breast-feed and roomed-in were more likely to still be breast-feeding at 4 months postpartum when compared with mothers who breast-fed but placed their infants in the nursery. A number of groups have reported a similar and significant positive relationship between the amount of time the mother spent with her infant in the maternity ward and breast-feeding success (Starling et al. 1979; Lindenberg et al. 1990; Buxton et al. 1991). Lawson and Tulloch (1995) reported that after controlling for a variety of potentially confounding demographic variables, breast-feeding duration was related to the extent of mother-infant contact in the 72 hours after birth. Conversely, Loughlin et al. (1985) found no association between breast-feeding duration beyond 2 months postpartum and rooming-in.

While these findings suggest a favourable association between the initiation of breast-feeding and rooming-in, it is not possible in most cases to determine the direction of the relationship. For instance, Samuels (1985) found that among the women who chose to room-in, 80% chose to breast-feed, whereas only 58% of those women who placed their infants in the nursery chose to breast-feed. Given that most women choose how they intend to feed their baby well before they are admitted to hospital (Coreil and Murphy 1988; Lawson and Tulloch 1995) it is unlikely that the practice of rooming-in has a direct effect on breast-feeding initiation. Rather, the association is probably

indicative of attitude; mothers who choose to breast-feed are also those who are likely to room-in.

Only a few reported studies in which mothers were either randomly assigned to a rooming-in group (RI) or a non-rooming-in (NRI) group immediately after delivery were found (Procianoy et al. 1983; Perez-Escamilla et al. 1992). Procianoy (1983) in one such study found that while the majority of mothers had made their feeding decision prior to study group assignment, those mothers that had roomed-in with their infants had a higher interest in nursing than those whose infants were cared for in a separate nursery, as was standard hospital practice at the time. While all mothers were discharged feeding their infants, 57% of the NRI group compared to 27% of the RI group had decided to stop nursing their infants soon after discharge. They proposed that as the two groups had comparable cultural and economic backgrounds that the difference in opinion between the two groups about continuation of nursing was influenced by emotional factors developed during the rooming-in experience.

Perez-Escamilla et al. (1992) conducted a well designed, quasi-experimental, randomly assigned study which controlled for a variety of potentially confounding variables such as method of delivery, infant health, parity and access to breast-feeding guidance. They found that rooming-in was positively associated with lactation performance only among primiparous mothers, and then only in the short term. They proposed that this short term impact of rooming-in on lactation success was due to an earlier initiation of breast-feeding and/or a much higher nursing frequency during the hospital stay when compared with the non-rooming-in system.

Another favourable spin-off associated with rooming-in, and the resultant enhanced mother-infant bonding, was observed in Thailand in the late 1980s. When the practice of rooming-in was introduced into a large regional hospital, the rate of deserted children decreased significantly over a 5-year

period from 3.6 infants per 1000 live births to 0.1 children per 1000 live births (Buranasin 1991).

Early mother-infant contact

Studies conducted in the early-1980s suggested that mothers who failed to breast-feed within the first two hours of birth were more likely to wean their babies early (Whichelow and King 1979; Wright and Walker 1983; Ferris et al. 1987). Buxton et al. (1991) more recently reported a negative association between delayed establishment of breast-feeding and breast-feeding success. They found that 77% of women who quit breast-feeding by day seven reported not breast-feeding in the delivery or recovery room, compared with 50% of women who breast-fed past seven days (X^2 = 15.48, df=2, p < .001). The negative effect of delayed contact on breast-feeding success remained when between-group differences in maternal age and level of education were controlled for. Lawson and Tulloch (1995) also reported that breast-feeding duration was related to the timing of the first breast-feed.

Lindenberg et al. (1990) found that early postpartum mother-infant contact combined with breast-feeding promotion was positively associated with the initiation of breast-feeding. However, the effects of these practices were not sustained over the long-term and, in contrast to these other studies, did not prolong breast-feeding or prevent early infant weaning.

Bernard-Bonnin (1989) conducted a meta-analysis of four controlled trials studying the influence of hospital practices on breast-feeding duration and concluded that early mother-infant contact positively influenced breast-feeding duration. However, Perez-Escamilla et al. (1994) conducted a more rigorous review of 14 studies on the effect of early contact on lactation success and concluded that the impact of early contact was unclear. While it may be beneficial among primiparae, it was not possible to attribute breast-feeding rates directly to early contact as several studies also included breast-

feeding guidance by health personnel or the presence of the father during early contact.

Similarly, Kearney et al. (1990), after reviewing 10 studies, concluded that there was little evidence to support the belief that delayed first feeding is an independent cause of breast-feeding failure. They argued that delayed breast-feeding was most likely to occur in those hospitals that were generally unsupportive of breast-feeding, and it was probably this lack of support which contributed to breast-feeding failure. They showed that breast-feeding support in the hospital environment and maternal commitment could over-ride the negative impact of delivery methods and delayed first breast-feeding.

Breast-feeding on demand

Studies have shown that frequent and unrestricted breast-feeding decreases peak serum bilirubin, and increases early milk production and infant weight during the first week of life (De Carvalho et al. 1983; Yamauchi and Yamanouchi 1990). In addition, Yamauchi and Yamanouchi (1990) demonstrated that the frequency of breast-feeding during the first 24 hours of life correlated significantly with frequency of meconium passage.

One advantage of rooming-in is that it allows for frequent and unrestricted suckling in the early days of life, which in turn has been shown to eliminate some neonatal feeding problems often associated with breast-fed neonates, such as weight loss, slow weight gain and elevated serum bilirubin levels (De Carvalho et al. 1983; Yamauchi and Yamanouchi 1990).

There is evidence to suggest that women who do not feed frequently during the establishment phase of breast-feeding often wean early (Hewat and Ellis 1986). Furthermore, breast-feeding on demand has been shown to reduce breast engorgement and to decrease nipple pain and breast soreness (Freed et al. 1991; Bear and Tiggs 1993; Moulden 1994).

Supplementary/Complementary feeds

It is difficult to clearly determine the effect of introduction of infant formula as few studies have differentiated between supplementation and complementation. Coreil and Murphy (1988) defined *supplementation* as the replacement of an entire feed with formula and *complementation* as giving formula immediately after a breast-feeding to complete a meal. Supplementation implies a reduction in the frequency of suckling and has been shown to result in decreased milk production. Thus, food or drinks that are thought of as supplements to breastmilk actually may supplant breastmilk. However, it is unclear what effect complementation of breast-feeding has on milk production as frequency of suckling remains unchanged.

The early introduction of formula supplements, as a routine hospital practice, has been negatively associated with duration of breast-feeding (Starling et al. 1979; Samuels et al. 1985; Kurinij and Shiono 1991; Michaelsen et al. 1994). Similarly, the introduction of formula by the mother early in the postpartum period (<2 weeks) has been associated with the early termination of breast-feeding (Loughlin et al. 1985). Feinstein et al. (1986) found that supplementing breast-feeding with more than one bottle of formula per day (measured at 1 month postpartum) was associated with shorter breast-feeding duration. Although, this effect was minimised by frequent nursing (seven or more time per day), despite formula supplementation.

These findings suggest that the early introduction of formula negatively influences the likelihood of successful breast-feeding. However, it may be that the women whose infants were given supplementary feeds were predisposed to lactation problems or had infants who were intrinsically more difficult to feed (Starling et al. 1979). Loughlin et al. (1985) found that infants who were rated in hospital by nursery staff as crying excessively, having a demanding personality or having trouble with feeding were significantly more likely to be exclusively formula-fed by two months, compared with infants who were rated as not having problems in these areas.

However, a study by Coreil and Murphy (1988) does not support the suggestion that formula supplementation may be a marker for lower maternal commitment or lactation difficulties, rather than an independent cause of early breast-feeding termination. Their results indicated that even when commitment and reported difficulties were statistically controlled for, supplementation before six weeks had a negative effect on breast-feeding duration measured at one year.

Similarly, Blomquist et al. (1994) studied the effect of early supplementation on duration and controlled for potentially confounding factors including low birth weight, gestational age, admission to the neonatal ward and neonatal weight loss $\geq$ 10%. They found that the use of supplementary formula or donor's milk during the early neonatal period significantly increased the risk of a short duration of breast-feeding (OR=3.9 $CI_{95\%}$ 2.1 - 7.2). The authors tentatively suggested that the association between early supplementation and short duration was causal and not spurious. However, they were quick to point out that maternal confidence and willingness to continue breast-feeding was not assessed. They noted that mothers with diabetes or gestational diabetes (where the supplements were given on 'medical' indications) did not show any shorter duration of breast-feeding. They postulated that supplementation of a newborn on strict 'medical' grounds does not disturb the maternal-child confidence as it does when supplements are given because of 'insufficient amounts' of milk or fussiness.

Staff Practices/ Breast-feeding guidance

Giugliani et al. (1994) found, after adjusting for potential demographic confounders, that breast-feeding guidance provided from doctors, nurses and/or dietitians had no association with feeding method. This finding has been reported by others (Dix 1991; Fitzpatrick et al. 1994) and is not surprising given that most women decide on their preferred method of infant

feeding well before they come into contact with most health care providers, that is before conception or early pregnancy.

Cronenwett and Reinhardt (1987) reviewed a number of descriptive, correlational and quasi-experimental studies to determine the effect of professional support on the breast-feeding decision. Their findings suggest that health care providers are rarely perceived as sources of influence on the feeding decision or as sources of help or support with breast-feeding. This contrasts with the perceptions of health care providers who tend to see themselves as the most important source of influence on mothers' decisions about breast-feeding and view as secondary importance the influence of friends, husbands and relatives.

The advice and support that health care providers give to mothers during the immediate post-natal period may have an impact on breast-feeding duration. However, in most intervention studies which have shown such an effect, the support was often given by one of the principal investigators who may have been committed to giving outstanding care that might not represent the norm (Cronenwett and Reinhardt 1987). Ellis and Hewat (1984) failed to show a positive relationship between breast-feeding duration and support from nursing staff, when they compared women who were randomly assigned to either a low or high nursing intervention group.

There is some evidence to suggest that breast-feeding information given as part of antenatal classes may positively influence duration of breast-feeding. For instance, Ford et al (1994) reported that attendance at antenatal classes was positively associated with the likelihood of exclusive breast-feeding on discharge and with longer duration of breast-feeding. Similarly, Piper and Parks (1996) reported that mothers who had participated in childbirth education classes were more likely to breast-feed for longer than six months when compared with non-attenders (OR=1.46 $CI_{95\%}$=1.140-1.897).

2.3.4 Psychosocial and cultural factors

Social Support

Breast-feeding is not instinctive and according to Brack (1975 p. 557)

> *"is a social behaviour and as such must be learned, like any other social behaviour in supportive integrated systems. Even after it has been learned, a woman needs to be in a socially supportive situation if she is to be successful."*

Social support can be divided into three categories:

1. emotional support (providing affection, love, empathy or acceptance);
2. tangible or instrumental support (task-oriented behaviours that directly assist the person); and
3. informational support (providing guidance, advice, facts and knowledge) (Hughes 1984; Matich and Sims 1992)

Traditionally, all three aspects of social support were provided by a *doula.* This person (frequently the mother of the new mother) supports the new mother and helps her with household duties, allowing her time to relax, establish her milk supply and become adjusted to her infant's needs (Barron et al. 1988). Several studies have found that the presence of a *doula* in the first few weeks postpartum increases the duration of breast-feeding. Barron et al (1988) in a study of low income women found that when a doula was present during the first two weeks postpartum, the average duration of breast-feeding was 23.4 weeks, compared with 12.3 weeks when a doula was not present ($p<.05$).

Support from the partner, family and friends has been implicated as an important factor that influences the choice and duration of breast-feeding (Eastham et al. 1976; Cronenwett and Reinhardt 1987; Grossman et al. 1990). The degree to which each of these groups influences a woman's decision to breast-feed varies according to the mother's age, social class and cultural or ethnic background (Matich and Sims 1992). Bryant (1982) in a US study

found that Anglo-American women tended to identify their husband as being their major source of support regarding infant feeding decisions and less often turned to their mother. On the other hand, women of Latin American origin were more likely to consult their mother on infant feeding matters, although husbands were responsible for most other family decisions. Anglo-American women considered their female friends to be important sources of information on infant feeding, while Latin American women considered friends to be poor sources of infant feeding advice.

A partner's attitude toward breast-feeding plays an important role in a woman's decision to breast-feed and wean (Littman et al. 1994). Fathers participate in and influence the choice of infant feeding method, and influence duration by acting as key supports or deterrents to breast-feeding by the mother (Jordon and Wall 1993). When the extended family is absent, as in the case of migrant mothers, women may rely heavily on husbands to support their breast-feeding decision and to help with household responsibilities (James et al. 1994). However, Hewat and Ellis (1986) suggest that psychological rather than physical support from partners may be more important for encouraging breast-feeding.

Prenatal breast-feeding intentions

A strong and consistent association has been found between intended duration of breast-feeding and actual duration (Loughlin et al. 1985; Grossman et al. 1990; Cronenwett et al. 1992; Lawson and Tulloch 1995; Perez-Escamilla et al. 1995). Quarles et al. (1995) reported that, after controlling for potentially confounding demographic factors such as maternal age, level of education, race, parity and socioeconmic status, intended duration was the strongest predictor of the actual duration of breast-feeding.

A number of studies have shown that breast-feeding duration is also strongly associated with when the decision to breast-feed is made. In general, the earlier the decision to breast-feed is made, the longer the duration (Goodine

and Fried 1984; Jones et al. 1986; Coreil and Murphy 1988; Buxton et al. 1991; O'Campo et al. 1992; Lawson and Tulloch 1995). Jones et al. (1986) suggest that an early decision might indicate a stronger desire and determination to breast-feed and hence distinguish mothers more able to overcome difficulties and to continue breast-feeding.

Previous breast-feeding experience/ success

Grossman et al. (1990) found that actual breast-feeding duration was not associated with previous successes but was correlated with previous attempts at nursing ($p<.05$). Conversely, Ferris et al. (1987) found that whether a mother had breast-fed or not was not associated with breast-feeding at 10 weeks. What did matter was the average length of time of the previous breast-feeding experience. A multipara who had difficulty nursing a previous child was likely to have the same problem again, while women who had successfully nursed previously continued to nurse exclusively.

Several studies have demonstrated that whether a woman was herself breast-fed as child was a strong predictor of duration, although the reasons for this were not clear (Entwisle et al. 1982; Jones et al. 1986). It is possible mothers have passed onto daughters a strong resolve to breast-feed, despite the problems or, alternatively that they provide more support, encouragement and even instruction (Jones et al. 1986). Entwisle et al. (1982) appear to support the first argument. They reported that whether or not the woman's mother helped in her first two weeks at home after return from hospital was unrelated to breast-feeding success. They proposed the most likely explanation to be that positive attitudes toward breast-feeding came about through socialisation during childhood. This socialisation prompted women to select breast-feeding and helped the women to be successful by perhaps increasing their expectations of success.

Comfort with breast-feeding in public.

Embarrassment or distaste with breast-feeding was a reason given by 33% of Canadian women (Mathews et al. 1995) and 31% of Irish women (Fitzpatrick et al. 1994) who chose not to breast-feed. Barron et al. (1988) in a study of low-income women, found that willingness to breast-feed in front of others (particularly a male other than their partner) appeared to contribute to the increased duration of breast-feeding. This association was also reported by Jones (1986). Furthermore, the degree of embarrassment that a woman experienced breast-feeding in front of others interfered with the level of enjoyment of breast-feeding and the degree of satisfaction felt. Although, embarrassment did not necessarily prevent mothers experiencing satisfaction and enjoyment.

Breast-feeding confidence/ enjoyment/ satisfaction

Ferris et al. (1987) found that women who were more confident of their ability to breast-feed at 2 weeks were more likely to still be breast-feeding at 10 weeks. Similarly, Buxton (1991) reported that a lack of confidence in ability to breast-feed was a significant predictor of failure to breast-feed for more than seven days. However, Lawson and Tulloch (1995) in a study of first time mothers found that, while confidence in ability to overcome problems was significantly related to planned duration of breast-feeding, confidence was not itself a predictor of actual duration. They highlighted the importance of considering primiparas as a separate population and contend that confidence and commitment have a different meaning for this group than when responses are based on a mother's own experiences of infant feeding.

A significant association between the degree of enjoyment experienced and the duration of breast-feeding was also reported (Jones 1986). The more enjoyable mothers found it the longer they breast-fed. Jones demonstrated an association between level of satisfaction and breast-feeding duration. Jones reported also, that satisfaction was closely related to mother's previous

experience, with those having previously breast-fed successfully being more satisfied with their most recent experience.

2.4 Limitations of previous studies

While there have been numerous studies of breast-feeding in the last two decades, many have suffered one or more methodological problems which have obscured the meaning and comparability of these studies (Winikoff 1981).

2.4.1 Definitions

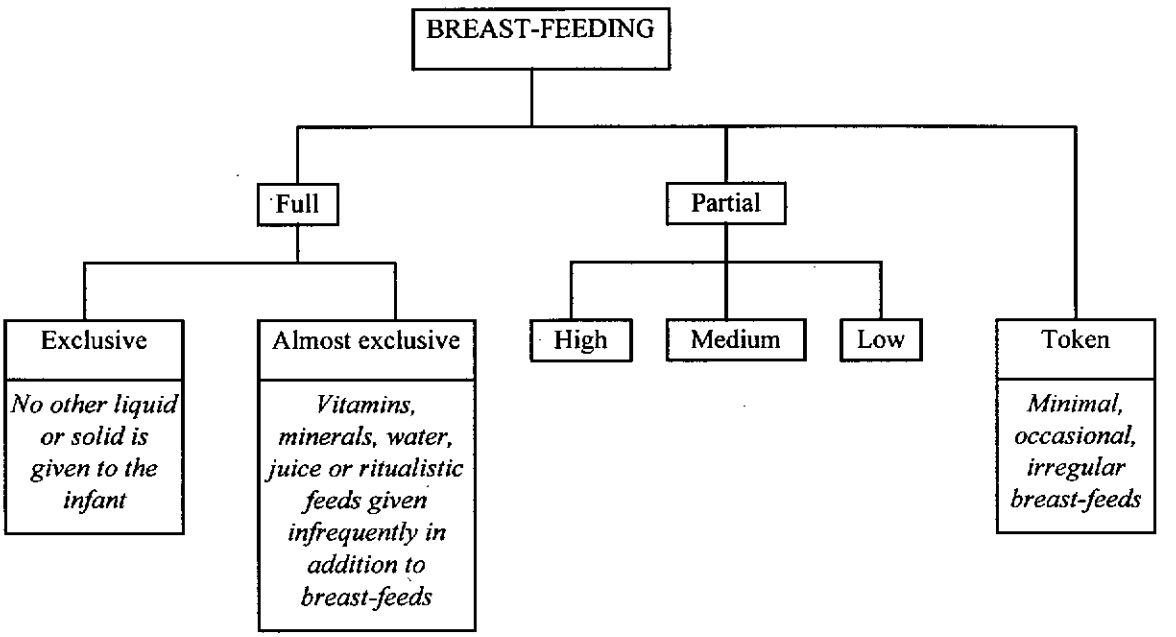
Most studies have failed to use consistent definitions which adequately distinguish between full and partial breast-feeding. This lack of precision and consistency in the definition of breast-feeding has led to misinterpretation of data and problems with comparability between studies (Labbok and Krasovec 1990). A common error is to record only duration of any breast-feeding, without regard to its intensity or exclusivity (Armstrong 1991). As research in developing countries has shown that even, minimal supplements have an effect on morbidity, nutritional status and mortality in infants, a clear distinction between full and partial breast-feeding must be made in any study investigating the association of breast-feeding and infant health. Even among the partial breast-feeders it is appropriate to further subdivide this category to account for the possible dose-response differences in health, nutrition and fertility impacts on women and infants (Labbok and Krasovec 1990).

In 1988, representatives of the US Agency for International Development, the Swedish International Development Agency, the World Health Organisation and the United Nations Children's Fund formed an *ad hoc* group called the Interagency Group for Action on Breast-feeding (IGAB). They agreed that consistent and standard definitions for breast-feeding were needed

"not only to ensure accurate conclusions by policy makers, but also to increase comparability of data collected from several countries or regions, to improve communication between programs and to increase usefulness of research presentation" (Labbok and Krasovec 1990 p. 226).

The development of a schema and framework to define breast-feeding was prompted by these concerns and is illustrated in Figure 2.5.

Figure 2.5:Schema for breast-feeding definition



Source:Labbok and Krasovec (1990: p227)

Full breast-feeding is subdivided into *exclusive* and *almost exclusive*. The *exclusively breast-fed* infant gets only breast milk, no water, other drinks or food. The *almost exclusively breast-fed* infant may receive small amounts of culturally valued supplements - water, water-based drinks, fruit juice, ritualistic fluids. Many studies have included non-nutritive supplements in their definition of breast-feeding, however as even the addition of water alone increases the risk of diarrhoea (Van Derslice et al. 1994), it is necessary to make the distinction between exclusive and almost exclusive breast-feeding. While the two terms may be combined under the term *full breast-feeding*

during later stages of data analysis, to combine them from the beginning may obscure potentially important relationships (Labbok and Krasovec 1990).

Partial breast-feeding includes three levels of substantial breast-feeding: *high, medium* and *low.* Suggested boundaries for the three categories of *partial* may be determined, for example, by the proportion of breast-feeds, relative quantity of breast milk consumed, or by the percent of energy provided by breast-feeding.

Token breast-feeding is characterised as minimal, occasional and irregular. It is applied at those times when the breast is used primarily for infant or child comfort and not for major nutritive purposes. This is the pattern common in a child's self-weaning period (Armstrong 1991). In the past, token breast-feeding has been counted along with all others as *breast-feeding* and has contributed to the misunderstanding and misinterpretation of breast-feeding data.

Most studies on breast-feeding reported in the public health literature are designed to either

1. monitor breast-feeding trends and/or evaluate the effectiveness of breast-feeding promotion programs, or
2. investigate the health effects of breast-feeding versus other modes of infant feeding. (Winikoff 1981)

Monitoring and surveillance studies should at the very least differentiate between *full* and *partial breast-feeding*, while studies investigating the impact of breast-feeding on infant and maternal health outcomes should distinguish between *exclusive* and *almost exclusive breast-feeding* as well as the different levels of *partial breast-feeding.* In order to distinguish between the various levels of breast-feeding, questionnaires must include reference to frequency, duration and exclusivity.

2.4.2 Differentiation between breast-feeding initiation and duration

Despite the multitude of studies which have investigated factors which influence onset and duration of breast-feeding in different settings, few studies have emphasised their uniqueness as conceptually different events (Mansbach et al. 1991). Studies may deal only with the initiation of breast-feeding, or even intention to breast-feed, while others look at determinants of duration. However, the factors that influence the decision to breast-feed are not necessarily the same as those which impact on duration. For instance, the professional care and advice received in hospital may affect the continuation of breast-feeding but, given that most women make their choice of feeding method prior to falling pregnant, is unlikely to have any great effect on the onset of breast-feeding. Mansbach (1991) suggests that the distinction between onset and duration of breast-feeding may allow for greater conceptual clarity and better prediction possibilities. Therefore, studies need to compare the mechanisms affecting the two events and identify, and differentiate between, variables predictive of initiation of breast-feeding and variables predictive of duration of breast-feeding.

Rutishauser and Carlin (1992) highlight the problems associated with attempting to make direct comparisons between studies. First, the number and kind of variables included differ from study to study. This makes it difficult, if not impossible, to evaluate the relative importance of individual factors as possible promoters or determinants of breast-feeding. Second many studies conducted prior to the mid-1980s simply reported univariate effects with relatively few adjusting for the effects of covariates by means of multivariate methods of analysis.

2.4.3 Sample size and selection.

Samples are often two small to allow analysis of specific subgroups such as ethnic groups or by socio-economic status. Having highlighted the importance of distinguishing between the different types of breast-feeding, it

should be noted that the problem of small sample size is compounded if breast-feeding is divided into too many categories, as the analytic groups become so small that statistically significant differences between them are often not found (Winikoff 1981).

When comparing breast-feeding rates between populations, or trends within the same population over time, it is important to standardise for any demographic differences between the populations studied which may account for the differences seen. Hendershot provides the following example to illustrate the confounding effect of group differences.

> *"If it were found, for instance, that group A is less likely than group B to breast-feed, and over time group A has come to comprise a larger part of the total population, that change in population composition alone would tend to produce a decline in the overall level of breast-feeding, with no change in the propensity to breast-feed in either of the two groups"* (Hendershot; 1984: 597).

Most studies depend on volunteers for subjects, often resulting in a study population that differs from the general population. This bias may affect any generalisations drawn from the findings (Simopoulos and Grave 1984). Most often women with fewer years of education and from minority groups are under-represented in population-based studies, and the results of these studies may not accurately reflect the breast-feeding incidence amongst members of socio-economically disadvantaged groups (Martinez and Nalezienski 1979; Goodine and Fried 1984; Rassin et al. 1984; O'Campo et al. 1992). Grossman et al. (1989) suggest that underprivileged women may be less likely to respond to a mail-in questionnaire and may be less likely to be located by mail or phone for inclusion in the survey in the first place. As such, weightings for education and other demographic factors need to be applied to correct for any discrepancies between the sample population and the general population.

2.4.4 Problems of reporting

Most studies investigating the initiation and duration of breast-feeding have been cross-sectional, retrospective surveys. Studies of this type offer the advantages of a shortened study period and the relative ease and efficiency of obtaining the data. However, the accuracy of the data is limited if respondents are recalling events and not reporting current status. Recall of events may give a false impression of accuracy as a result of the twin problems of recall bias and 'heaping' of data (Winikoff 1981).

Retrospective recall of infant feeding events can lead to the 'heaping' of data. This is particularly evident in reports from developing countries which display marked 'heaping' at six, 12 and 18 months (Jain and Bongaarts 1981). This 'heaping' may be genuine, and simply reflect cultural norms or preferences about appropriate weaning times. However, such 'heaping' is less obvious when survival curves are computed from data collected from cross-sectional studies in which women report current status (Trussell et al. 1992).

Decisions on the frequency of observation and the interval period between observations may have important effects on the quality and quantity of data collected. If interviews require recall of events over a considerable period in the past (for instance, several months between interviews, or one retrospective interview covering the entire feeding history of an infant), data are subject to recall biases. Mothers may tend to recall certain events and forget others (Winikoff 1981). This is specially an issue in studies investigating the reasons for changes in feeding patterns, for example termination of breast-feeding. Too long a recall interval may result in the mother not being able to accurately recall the specific events that led to termination.

Feeding practices change frequently during the first few months after birth. An infant may be breast-fed, mixed fed and artificially fed, all within the

space of a month or two. In addition, weaning itself is a gradual process: babies rarely switch abruptly from one feeding mode to another. Selection of the precise time period or age to administer questionnaires to, or interview, women often poses a problem (Winikoff 1981). For studies monitoring trends in breast-feeding or evaluating breast-feeding promotion programs, it is essential to have precise data on the length of breast-feeding and the specific 'landmarks' pertinent to weaning. Construction of an accurate life table of breast-feeding and weaning events will help identify points at which greater-than-expected numbers of mothers either stop nursing or start supplementary feeds (Winikoff 1981).

2.4.5 Accuracy of maternal recall of breast-feeding initiation and duration

It would appear that most mothers can accurately recall whether they initiated breast-feeding, even after long periods of time. In one Australian study, Tienboon et al. (1994) compared mother's recall with recorded data after an interval of 14-15 years. Recall of the initial method of feeding was in agreement with that recorded for 85% of the mothers. Overall, the sensitivity of asking mothers, whether or not they had breast-fed was 82% and the specificity 93%, suggesting that maternal recall of initial method of breast-feeding is a valid way to determine retrospectively breast-feeding initiation rates. However, recall was not a valid measure of the initial method of feeding for mothers who had breast-fed their infants for less than one month, since only 65% of mothers recalled breast-feeding their infants after this interval of time. Furthermore, analysis of the data according to birth order showed better agreement for first- and second- born children (86%) than for later born children (76%). Therefore *post hoc* studies may underestimate breast-feeding initiation rates for higher birth order infants and for infants breast-fed for less than one month.

In a recent study of Bedouin Arab women, data from interviews conducted 12 and 18 months postpartum were compared to the standard data collected at 6

months postpartum (Launer et al. 1992). The results of this study suggest that data on infant feeding collected retrospectively by maternal recall of events that took place less than 18 months ago are accurate and can be used with confidence in epidemiologic studies. Although, the authors did note that maternal recall of duration of breast-feeding increased with length of recall.

Eaton-Evans and Dugdale (1986) in a study of Australian women, reported that after an average interval of three years 79% of women could correctly recall duration of breast-feeding to within one month, and 95% to within two months, of that recorded. The level of education and parity of mother had no significant effect on the accuracy of the mother's recall. Huttly et al. (1990) reported that after an interval of four years 70% of a group of Brazilian women were able to correctly recall duration to within a 3-month period. Misclassification was evident in all subgroups - which covered a wide range of income and education levels.

Longer recall intervals may produce less reliable data on breast-feeding duration. Teinboon et al. (1994) found that after an interval of 14-15 years, only one-third (37%) of mothers could recall duration of breast-feeding to within one month, and 59% to within two months, of the recorded duration. Both of these proportions are much lower than reported by Eaton-Evans and Dugdale (1986) in their earlier Australian study, illustrating the effect of the greater recall interval of 14 years compared to three years.

Depending on community norms and socially approved infant feeding practices, mothers might be likely to recall more or less breast-feeding than actually occurred. Eaton-Evans and Dugdale (1986) found approximately equal numbers of mothers who over-estimated and under-estimated the duration of breast-feeding. However, most studies have identified a tendency for mothers to report a longer duration than a shorter duration (Huttly et al. 1990; Launer et al. 1992; Tienboon et al. 1994). Huttly et al. (1990) in a study of Brazilian women, observed more respondents reporting a longer duration

than a shorter duration, suggesting that mothers felt they should breast-feed longer (even if they actually did not). The fact that this tendency was more pronounced in the richer, better educated women supported their theory. Tienboon et al. (1994) found that mothers tended to over-estimate the duration of breast-feeding in the direction of recent trends in infant feeding.

Mothers who breast-fed for longer periods (> 6 months) were also more likely to over-estimate duration (Eaton-Evans and Dugdale 1986; Huttly et al. 1990). Conversely, in the study by Tienboon et al. (1994) mothers who breast-fed for less than one month were less likely to recall ever breast-feeding, perhaps holding the view that breast-feeding had not continued sufficiently long for it to be important enough to mention.

2.4.6 Questionnaires

Most studies investigating breast-feeding rates and practices rely on questionnaires, which is probably the most economical way to collect this data. However, there are a number of inherent limitations in this methodology, such as non-return of questionnaires and incomplete or inaccurate responses to questions (Rutishauser and Carlin 1992). Butz (cited in Simopoulos and Grave, 1984) has criticised the use of unstructured questionnaires on breast-feeding. He points out that many women only mention hospital delivery practices, formula advertising or work if a structured questionnaire lists these items. Furthermore, questionnaires require a certain degree of literacy, motivation and co-operation of mothers to complete and may explain why women with fewer years of education are under-represented in studies utilising self-administered questionnaires.

2.4.7 Statistical analysis of data

Studies which attempt to correlate the incidence and duration of breast-feeding with possible determinants in society, such as the family, the mother, or the infant, often fail to consider that the problem is multivariate in nature

(Persson 1985). Analyses have often been terminated after searches for univariate associations and the application of statistical significance tests. In most studies of breast-feeding habits, conducted in the late 1970s to late 1980s, a series of univariate analyses were undertaken, whereby neither estimations of the relative importance of different determinants nor identification of interactions was possible.

However, many reported associations between various socio-demographic factors and breast-feeding rates that are apparent with univariate analysis may be spurious. For example, there is a strong and consistent association between maternal age and duration of breast-feeding. However, maternal age is also associated with social class and education, as women from higher social classes are likely to be better educated and be older when they start a family (Bacon and Wylie 1976; Bee et al. 1991). Similarly, when controlled for maternal age, parity does not appear to be associated with breast-feeding duration (Feinstein et al. 1986).

Persson (1985) suggests that a more comprehensive approach to the study of breast-feeding determinants necessitates multivariate analysis of the data, which allows for simultaneous interpretation of associations and interactions between variables. With the advent of powerful statistical programs for personal computers (Norusis 1993) it is now possible to conduct the sophisticated multivariate analysis of data needed to estimate the importance of different determinants while controlling for covariates and confounders.

Thus the major deficiencies of previous studies could be improved by:

1. A longitudinal study with frequent observations of short interval (e.g., months). This would avoid many of the limitations associated with retrospective data, particularly when measuring breast-feeding duration and identifying reasons for termination;
2. Adequate sampling - the sample size should be appropriate to provide reliable data for designated population subgroups.

3. Attention to standard definitions of breast-feeding and complementary feeding;
4. Identifying and differentiating between variables predictive of initiation of breast-feeding and variables predictive of duration of breast-feeding;
5. Using structured questionnaires/interviews, designed specifically for women with low literacy skills;
6. Using multivariate methods of analysis which control for covariates and confounders;

3 Methodology and Sample Characteristics

3.1 Overview

A longitudinal study of 556 Perth women was conducted over the period September 1992 to April 1993. Women delivering at two metropolitan hospitals in Perth were visited in the three days following birth and invited to participate. Those mothers agreeing to participate completed a self-administered baseline questionnaire while in hospital to determine breast-feeding initiation rates. Mothers who were breast-feeding at the time of completing the questionnaire were followed-up by telephone interview at 2, 6, 10, 14, 18 and 24 weeks postpartum, or until they ceased to breast-feed.

3.2 Development of survey instruments

Prior to developing the survey instruments, six focus groups were conducted with mothers of infants under 12 months of age, who were either still breast-feeding, or had breast-fed, their infant. One goal of these focus groups was to discuss various issues related to the women's breast-feeding experiences in order to identify the terminology they used when discussing the topic and their responses to key questions that were then included as options in the survey instruments. A detailed description of the focus group methodology and results are provided in Chapter 4. The questions used in the baseline survey were generated from the recent literature and a number of questions were taken from a questionnaire previously developed and pilot-tested by the Department of Public Health at the University of Sydney (D. McKerras. Personal Communication, 1992)

The baseline survey instrument was an 18 page structured questionnaire, consisting of 63 items and took approximately 30 minutes to complete. The questionnaire contained both closed- and open-ended items generated by the

focus groups and the literature. The closed-ended items were prospectively coded, and common responses to the open-ended items were grouped and coded retrospectively (Appendix 1).

Questions were designed to identify feeding method while in hospital and to collect information on variables known, or suspected, to be associated with breast-feeding initiation and duration:

- socio-demographic factors (e.g. maternal age, education, occupation, ethnicity, marital status, family income, partner's occupation)
- psychosocial factors (e.g. maternal attitudes and beliefs, influence of significant others, social support),
- bio-medical factors (e.g. method of delivery, use of pain relief), and
- hospital practices (e.g. early mother-infant contact, demand feeding, rooming-in, antenatal and post-natal education)

Questionnaires require a certain degree of literacy, motivation and co-operation of mothers to complete. Therefore as the baseline questionnaire was to be self-administered every effort was taken to ensure that it was easy to read, comprehend and complete. The draft questionnaire was reviewed by two adult literacy experts who provided advice on language and layout and appropriate modifications were made to the questionnaire following their comments. The questionnaire was then pilot-tested on a group of 20 new mothers who were contacted via the birth notices in the daily newspaper. They were asked to complete the questionnaire and to make comments about clarity of wording, ease of completion and understanding of the instrument. Again modifications were made to the questionnaire based on their comments.

Items included in the follow-up questionnaire were again generated by the literature. Questions were designed to elicit information on current feeding practices, the types of problems experienced by women during the course of lactation, and to pinpoint the time of weaning and identify reasons for the

cessation of breast-feeding given by women who stopped breast-feeding before six months postpartum. As the questionnaire was to be interviewer administered by telephone, issues of respondent literacy were not of major concern, but the questions needed to be short and simple to understand (Appendix 2).

3.3 Data Collection

3.3.1 Recruitment of sample

The study sample was recruited, over the period September 1992 to April 1993, from two metropolitan regional hospitals that drew their patients from primarily low-income areas. Low income was defined as approximately 50% or more of the households having incomes of < $25 000 (Kelly 1993). Attempts were made to contact all women who delivered at each of these hospitals. The sample was consecutive and unselected.

Each hospital was visited three times a week and all mothers who were on the ward at the time of the visit, were visited by the project staff and invited to participate in the study. Women who had delivered in the previous 24 hours were not interviewed until the next visit. In several instances, nursing staff requested that certain mothers not be approached on the basis that they were too tired or distressed to be visited. These included women who had undergone a recent Caesarean section delivery and/or whose infants were being cared for in the Special Care Nursery. In these cases the research assistants attempted to contact the women during a later visit.

Even though the research staff attended the hospitals three times a week, it was likely that they missed contacting those women who were participating in the Early Discharge programs, and had been discharged within 24-48 hours of delivery. In addition, it was not possible to contact mothers if they were sleeping, showering, had visitors or were not in their beds at the time that the

research assistant was present on the ward. When research staff returned some of these women had been discharged during the intervening period.

3.3.2 Administration of baseline questionnaire

While the primary purpose of the study was to investigate breast-feeding, women were advised that they would be participating in a study to investigate infant feeding practices. Care was taken not to motivate the mother towards any specific feeding method. At this time they were informed that participation in the study would require them to complete a questionnaire while they were in hospital, followed by a monthly telephone interview commencing at two weeks post-partum for up to six month. They were assured of anonymity and confidentiality and that their completed questionnaires would not be viewed by hospital staff. Once recruited into the study women were assigned an ID number and were required to sign a consent form. They were also requested to provide their names, address and phone number so they could be followed-up by phone call, or by home visit in the case of those women who did not have a telephone. Information on infant sex, gestational age, birth weight and length were recorded onto an information sheet at this time.

Mothers were instructed to complete the questionnaire as fully as possible and to seal the questionnaire in the return paid envelope provided. They were asked to place the envelope in a sealed box kept on the maternity ward which was emptied by the research assistants on their visits. Alternatively, if they preferred or forgot to complete the questionnaire in hospital, they could mail the questionnaire directly to the University. Project staff left the questionnaire with the respondent to minimise test anxiety.

Women declining to participate in the study were requested to provide some basic demographic information, including age, years of education, marital status, type of medical insurance and method of feeding. It was explained that this information was required to determine if the women participating in the

study were representative of new mothers in general. This information was collected from almost all women who were contacted but refused to participate in the study. However, it is not available for those women who participated in the early discharge program and were discharged prior to being contacted by the project staff. Nor is it available for those women who agreed to participate in the study but failed to complete the baseline questionnaire.

3.3.3 Follow-up Interviews

Mothers who identified breast-feeding as their choice of feeding method on the baseline questionnaire were contacted by telephone at two weeks postpartum. Subsequent follow-up interviews were scheduled for 6, 10, 14, 18 and 24 weeks post-partum. At the first phone interview women were asked to identify a time of the day for conducting future phone interviews that best suited them and their baby's routine. If a woman was contacted at a time that for some reason was inconvenient, arrangements were made for the interviewer to ring them at a more convenient time. Interviews lasted between 10 and 30 minutes depending on whether mothers had experienced problems with breast-feeding and/or had changed feeding methods, and their general propensity for conversation. Women were contacted within three days of the scheduled day and a minimum of five attempts, at different times of the day and early evening, were made to contact any hard to reach women before they were designated as being lost to the study.

Women were followed until they terminated breast-feeding or for 24 weeks if they continued to breast-feed until this time. The same follow-up questionnaire was used at each of these interviews. However, if a mother had terminated breast-feeding prior to 24 weeks a set of additional 'termination' questions were included to identify her reasons for cessation.

All interviews were conducted by two interviewers who received specific training from the principal investigator. A limitation of telephone surveys is

that interaction of respondent and interviewer may introduce a social desirability or interviewer distortion (Dillman 1978). During follow-up phone interviews care was taken not to influence the mother towards any specific pattern, but only to record her self-reported behaviour. No advice about breast-feeding was given.

3.4 Ethical considerations

The study design and questionnaires met the standards set by the Human Ethics Committee of Curtin University of Technology, the Health Department of Western Australia's Confidentiality of Health Information Committee (CHIC), and those set forth by the participating hospitals.

Women were informed that participation in the study was on a voluntary basis and that they could withdraw without penalty from the study at any time. They were also informed that the study was separate from the activities of the respective hospitals and that non-participation would have no impact on the treatment and care they or their infant received whilst in hospital. Signed informed consent was obtained at recruitment after a detailed description of the study was presented orally to the mother and questions were answered (Appendix 3).

Anonymity and confidentiality of results was assured and maintained throughout the course of the study. Participants were assigned an ID number which was printed on their baseline and follow-up questionnaires. They were also asked to provide their name and address which was linked to their ID number for tracking purposes only. All information and questionnaires were stored in locked filing cabinets with names and addresses of participants being stored separately from their questionnaires. Results are presented as grouped data.

3.5 Analysis of data

All data were coded, computer entered and analysed using the Statistical Package for Social Sciences (SPSS-for Windows) (Norusis 1993). Frequencies were run to identify any coding and data entry errors. Plausibility checks were conducted to identify out of range responses and inconsistent data which were compared with the original questionnaire and data were cleaned appropriately. Between-coder variation was avoided by having the same individual code all questionnaires.

As a preliminary investigation of the data, contingency tables of breast-feeding versus potential explanatory factors were made along with univariate logistic regression analysis. Multivariate logistic regression analysis was employed to determine which individual variables could best predict the chosen method of feeding. All variables reported in the literature to be associated with the decision to breast-feed, along with a variety of interaction terms, were included in the full model. The full model was reduced using the backward stepwise procedure and the fitness of the model was assessed at every step to avoid dropping non-significant variables that affected the model fitness. No statistically significant interaction effects were found between variables in the model. All variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 test statistic on the relevant degrees of freedom was significant.

Survival analysis was used to examine the duration of breast-feeding as it provides a good understanding of breast-feeding behaviour over time (Norusis 1993). This type of analysis is used due to the presence of censored data. The term 'censored data' refers to data from those cases where there was no discontinuation of breast-feeding either by the end of the study period (24 weeks) or by the time the subject dropped out of the study. Advantages of this method of analysis are that it allows for the adjustment for effects of covariates as well as loss to follow-up. That is, it uses all available data and

therefore is a more powerful statistical technique than single point prevalence. Survival plots based on Kaplan-Meier survival estimates were used to illustrate the duration of the breast-feeding period.

The effect of individual variables on the duration of breast-feeding was initially evaluated using the Kaplan-Meier estimate of survival and the log-rank test was used to assess the equality of the survival curves. Variables reported in the literature to have an effect on the duration of breast-feeding were investigated using Cox's proportional hazards model. This model allows joint estimation of the effects of independent variables on the risk of cessation of breast-feeding and can be used to analyse data that contain censored observations (Norusis 1993). The assumption of proportionality of categorical variables was tested for by calculating the log-minus-log of the survival function of each explanatory variable and plotting this against log-time (duration).

Variables reported in the literature to be associated with breast-feeding duration were included in the full model which was then reduced using the backward stepwise procedure. The fitness of the model was assessed at every step to avoid dropping non-significant variables that affected the model fitness. All variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 test statistic on the relevant degrees of freedom was significant.

3.6 Participation rate

In total 948 women delivered at the two participating hospitals during the study period. Of these, 717 mothers were contacted while they were in hospital and 610 women agreed to participate. Useable data were obtained from 556 women who completed and returned the questionnaire - representing 90% of consenters, 77% of those women contacted by the research team and 58% of those eligible to participate. This response rate is similar to that of a large Canadian study of 780 women, which represented 56% of those eligible or 90% of those who had agreed to participate (Beaudry et al. 1995).

3.7 Demographic characteristics of participants and non-participants

Those women declining to participate in the study were asked five short questions related to their socio-demographic status and chosen method of feeding to allow comparison with the study sample. There were no significant differences between participants and those who declined to particiate with respect to age, level of education, marital status, type of medical insurance and chosen method of feeding (Table 3.1).

Table 3.1: Demographic characteristics of participants and non-participants

	Participants (n=556) (%)	Non-participants (n=107) (%)	
Age of mother			
< 20 yrs	7	9	X^2 5.18 df 5
20-24 yrs	23	30	p=.394
25-29 yrs	35	29	
30-34 yrs	24	27	
35-39 yrs	8	3	
≥ 40 yrs	3	1	
Years of education			
< 12 yrs	63	68	X^2 3.29 df 2
12 yrs	22	25	p=.193
> 12 yrs	15	7	
Marital status			
Never married	6	15	X^2 4.92 df 3
Married	71	68	p=.178
Defacto	21	15	
Divorced/separated	2	2	
Health insurance			
Medicare	92	90	X^2 0.28 df 1
Private	8	10	p=.621
Feeding method			
Breast-fed	77	74	X^2 0.58 df 2
Bottle-fed	16	20	p=.748
Combination	7	6	

3.8 Socio-demographic characteristics of participants

The majority of mothers recruited into the study were less than 30 years of age (64.6%), married (or had been married) (72.3%), multiparous (69.3%), had received less than 12 years of education (63.3%) and had been born in Australia or New Zealand (75.7%) (Table 3.2). The age of women ranged from 16 to 44 years (mean = 27.7 ±5.4 yrs) and the years of education ranged from 8 to 21 years (mean = 11.3 ± 1.8 yrs).

Table 3.2: Socio-demographic characteristics of participants (n=556)

	n	%
Age of mother		
< 20 yrs	38	6.9
20-24 yrs	125	22.7
25-29 yrs	193	35.0
30-34 yrs	135	24.5
35-39 yrs	46	8.3
≥ 40 yrs	14	2.5
Years of education		
< 12 yrs	341	63.3
12 yrs	116	21.5
> 12 yrs	82	15.2
Marital status		
Never married	35	6.4
Married/ Div/ Sep	398	72.3
Defacto	118	21.4
Mother's occupation		
Professional/Admin	61	12.0
Sales/Clerical	145	28.6
Trades/Labourers	59	11.6
Other	242	47.7
Partner's occupation		
Professional/Admin	99	19.6
Sales/Clerical	41	8.1
Trades/Labourers	317	57.0
Other	48	8.6

Table 3.2 cont.: Socio-demographic characteristics of participants (n=556)

	n	%
Mother's country of birth		
Australia/New Zealand	417	75.7
United Kingdom/ Eire	84	15.2
Asia	30	5.4
Middle East/ North Africa	2	0.4
Other	18	3.3
Maternal grandmother's country of birth		
Australia/New Zealand	337	61.2
United Kingdom/ Eire	130	23.6
Asia	33	6.0
Middle East/ North Africa	3	0.5
Other	48	8.7
Family income		
<$15000	107	22.0
$15001-$25000	142	29.2
$25001-$40000	162	33.1
>$40000	77	15.8
Infant birthweight		
<2500g	25	4.5
2500-3999	476	85.6
≥4000g	55	9.9
Parity		
Primiparous	170	30.7
Multiparous	383	69.3

A total of 94 women (17%) dropped out of the study at some stage after having completed the baseline questionnaire. Of these 64 (68%) completed the baseline questionnaire but did not participate in any follow-up interviews. When compared with women who dropped out of the study at some stage, women remaining in the study were slightly older, better educated and had a higher family income (Table 3.3).

Table 3.3: Socio-demographic characteristics of participants who remained in the study and those who were lost to follow-up

	Percentage of remaining participants (n=462)	Percentage of drop outs (n=94)	
Age (years)			
< 20	6.8	7.6	X^2 11.353 df 5
20 - 24	20.5	33.7	p=.0448
25 - 29	36.2	29.3	
30 - 34	24.2	25.0	
35 - 39	9.4	3.3	
40+	2.8	1.1	
Years of education			
< 12	62.8	65.5	X^2 = 6.573 df 2
12	20.4	27.6	p=.0373
> 12	16.8	6.9	
Marital status			
Never married	5.4	10.9	X^2 4.622 df 2
Now married/Div/Sep	73.6	65.2	p=.0991
Defacto	20.9	23.9	
Mother's occupation			
Profess/Admin	12.5	9.6	X^2 4.392 df 3
Sales/Clerical	28.5	28.9	p=.2221
Trades/Labourer	12.7	6.0	
Other	46.2	55.4	

Table 3.3 cont.: Socio-demographic characteristics of participants who remained in study and those who were lost to follow-up

	Percentage of remaining participants (n=462)	Percentage of drop outs (n=94)	
Partner's occupation	20.5	15.0	
Profess/Admin	8.5	6.3	X^2 3.314 df 3
Sales/Clerical	62.4	63.0	p=.3457
Trades/Labourer	8.7	13.8	
Other			
Family Income			
< $15 000	19.0	38.9	X^2 19.237 df 3
$15 001 - $25 000	28.4	33.3	p=.0002
$25 001 - $40 000	35.4	19.4	
≥ $40 001	17.1	8.3	
Mother's country of birth			
Australia/ NZ	75.0	79.1	X^2 7.657 df 4
UK/ Eire	16.3	9.9	p=.1050
Asia	4.8	8.8	
M East/ N Africa	0.2	1.1	
Other regions	3.7	1.1	
Parity			
Primiparous	30.4	32.6	X^2 0.181 df 1
Multiparous	69.6	67.4	p=.6707
Birthweight			
< 2500 g	4.3	5.3	X^2 0.889 df 2
2500 - 3999 g	85.3	87.2	p=.6412
≥4000 g	10.4	7.4	

For ease of presentation the results of the study will be presented in four chapters:

Chapter 4: Attitudes towards breast-feeding: A qualitative analysis

Chapter 5: Results - Unvariate analysis of factors influencing the initiation and duration of breast-feeding

Chapter 6: Results - Multivariate analysis of factors influencing the initiation and duration of breast-feeding

Chapter 7: Breast-feeding experiences

4 Attitudes towards breast-feeding: A qualitative analysis

4.1 Introduction

Despite the fact that the public is often confronted with the sight of bare breasts on public beaches, television, film and in magazines, many people are embarrassed, or in some cases even offended, by the sight of a woman breast-feeding in public. As a result women from Western cultures are often embarrassed or apprehensive about breast-feeding in public. This embarrassment may contribute to the early termination of breast-feeding.

Most research in the area of breast-feeding has concentrated on either the nutritional and health benefits of breast-feeding or the epidemiology of breast-feeding. Limited research has been conducted into the psycho-social or behavioural aspects of breast-feeding, especially in Australia. However, in order to encourage and support breast-feeding in general, and to increase the social acceptability of breast-feeding in public, it is necessary to first explore and understand public attitudes towards breast-feeding.

4.2 Use of focus group interviews in qualitative health research

The use of more objective quantitative research methods such as face-to-face, telephone or mail surveys often do not provide useful insights into determinants of intimate and sensitive health behaviours such as sexual practices, or in this case the practice of breast-feeding. An alternative, qualitative research technique is the focus group which attempts to uncover, understand and explain the feeling and opinions that exist in a target group (Basch 1987; Egger and Mowbray 1993). While quantitative research attempts to identify *what* people do, and *how many* do it, qualitative research focuses on the underlying reasons for *why* people do it.

Focus groups are commonly used in market research and are being used more frequently in health promotion planning and research (Egger and Mowbray 1993). They are frequently used to identify needs for services and programs, to pre-test materials and strategies, as a means of process evaluation during the implementation phase of programs, and following implementation to supplement quantitative impact and outcome evaluation data (Mullis and Lansing 1986; Basch 1987; Trenkner and Achterberg 1991; Brown et al. 1992; and Shepherd 1992; Egger and Mowbray 1993).

While various researchers have identified that certain groups of women are embarrassed or uncomfortable with breast-feeding in public (Holt and Wolkind 1983; Wright and Walker 1983; Jones et al. 1986; Mathews et al. 1995), few have explored the reasons behind their embarrassment. For this reason a series of focus groups were conducted to:

1. identify attitudes and beliefs related to breast-feeding which may not readily be detected using quantitative research techniques, and

2. generate questions and terminology for a quantitative survey instrument to be used in the prospective cohort study of breast-feeding mothers to be conducted at a later date.

4.3 Methods

A total of 12 focus groups were conducted involving 79 participants. Group size varied from 3 to 16 participants. Despite over-recruiting, half of the groups contained only 3 to 5 participants. Each focus group ran for 60-90 minutes. As a wide range of opinions were desired a number of different groups were interviewed.

1. **Mothers of infants and small children**. As young mothers are the primary target of most breast-feeding interventions it is important to establish their attitudes towards the practice of breast-feeding. . (*Mothers group* = 4 groups: 22 participants, aged 21-34 years with roughly equal numbers of women having less than 12 years of education or 12 or more years of education)

2. **Fathers of infants and small children**. Research suggests that the support of a mother's husband or partner is an essential ingredient for successful breast-feeding. (*Fathers group* = 1 group: 7 participants, aged 23-38 years with the majority having less than 12 years education)

3. **Male university students**. This group represents the next generation of fathers and identifying their attitudes and beliefs will provide some indication of the type and level of support that they are likely to give their future partners. (*Students group* = 2 groups: 25 participants, representing a broad cross-section of faculties)

4. **Adolescent girls**. This group represents the next generation of mothers, and again identification of their attitudes and beliefs will provide some indication of the likelihood of them breast-feeding in the future. *(Girls group* = 2 groups: 18 participants, aged 13-17 years)

5. **Nursing Mothers Association of Australia (NMAA) members and counsellors**. This group by virtue of their membership of, and participation in, the NMAA were included as a sample of mothers committed to breast-feeding. (*NMAA group* = 1 group: 9 participants, aged 24-43 with the majority having greater than 12 years of education)

With the exception of the male university students and NMAA members and counsellors, participants were recruited from busy shopping centres in two low income areas in Perth. University students were recruited on campus and

NMAA participants were recruited directly from a local branch of the NMAA. All potential participants were advised that they would be discussing infant feeding practices. Childcare was available for the groups involving mothers and a $10 participation fee was paid to each of the male university students and adolescent girls. No attempt was made to randomly select participants as the primary objectives of the focus groups was to generate concepts and ideas rather than provide representative data (Egger et al. 1992).

Certain predefined topics were addressed in the initial focus groups and these topics, as well as issues and concerns raised in early interviews, directed the course of subsequent interviews. In order to allow the conversation to proceed as naturally as possible the topics were not always raised in the same sequence nor posed in exactly the same way for each focus group. A series of five photographs were used to trigger discussion and explore participants' attitudes to breast-feeding in general, and in particular, breast-feeding in public. The photos were specifically taken for use in the focus groups and were enlarged to 20 x 30cm size prints for easy viewing. They featured women breast-feeding in a variety of situations:

Photo 1 A mother 'discreetly' breast-feeding an infant on a public bus

Photo 2 A mother 'discreetly' breast-feeding an infant in a cafeteria in mixed company

Photo 3 A mother 'discreetly' breast-feeding at a private social gathering in mixed company

Photo 4 A mother breast-feeding an infant in the privacy of her own home, wearing a bathrobe that was opened to reveal both breasts.

Photo 5 A mother breast-feeding a toddler dressed in play clothes and sandals.

The majority of participants appeared to be candid in their responses and comfortable with the topic discussed. Conversations were tape-recorded (with

the consent of participants) and later transcribed and content analysed for emerging themes.

4.3.1 Data analysis

Each transcript was read and analysed independently by two separate analysts to reduce the risk of biased interpretation (Trenkner and Acherberg 1991). Analysis of the focus group discussions followed the procedure recommended by (Krueger 1988). Summaries of the focus groups were written at the completion of each discussion. Each analyst read these summaries in one sitting and made notes on potential trends and patterns. Strongly held opinions and frequently held opinions were noted. The transcripts of the focus groups were then reviewed with each analyst marking sections of the transcript which related to each of the photographs used to trigger discussion. At this time participant comments thought worthy of future discussion were marked. Each of the corresponding tapes was listened to during this process to ensure that participants were correctly identified and that statements were accurate and complete. Particular attention was paid to the tone and intensity of the oral comments to ensure that correct emphasis was placed on the written comments. At the end of this process a variety of dominant themes had been identified by each analyst.

Each analyst re-read the transcripts and listened to the tapes concentrating on one theme at a time. A summary of each theme was prepared with particular attention being placed on identifying themes or patterns across the groups as well as themes that related to respondents with similar characteristics. A final report was prepared which highlighted dominant themes and illustrated them with selected comments. In general, there was good inter-rater reliability, and the dominant themes discussed in this chapter were readily and independently identified by both analysts.

A limiting factor in the study is the fact that only one focus group was held with each of the fathers and nursing mothers groups. This introduces a

potential for bias as in focus group design one strong individual can influence a whole group. However, while recognising this as a design flaw, it does not appear to have significantly influenced the results as, in most cases, the themes identified in these two groups were common across all groups.

4.4 Findings and interpretations

Content analysis revealed a number of distinct themes with relevance for breast-feeding promotion.

4.4.1 Breast-feeding in public

In most cases breast-feeding in public was seen by mothers and fathers of young infants and children as being routine, necessary and often unavoidable.

I mean either they cry or you feed them - if your baby is screaming - you don't have a lot of choice . . . you just feed to keep the baby quiet. (Mothers group)

When there is someone who needs a feed you usually look for the most convenient spot, or some place to put yourself down, and that's about it. (Fathers group)

In general, the fathers interviewed had no problems with their wives breast-feeding in public and defended their right to do so.

(If) you take offence . . . (then) get the next bus!. (Fathers group)

Several women recalled incidences when their partners had been particularly supportive.

. . . my partner , he encouraged me. We were at a restaurant one time and I had to feed the baby but there was nowhere to feed . He said "just feed him here". I said "but there are all these people here" and he said "just feed him here - if they don't like it they can move". (Mothers group)

One father described a situation where he and his family had walked out of a popular family restaurant because his wife had been asked by the management not to feed in public but to retire to the toilet. However, this appeared to be an isolated case as other fathers indicated that their wives regularly breast-fed at a number of popular family restaurants, without incident.

In contrast, several women reported occasions when their partners had been embarrassed by them breast-feeding in front of other people.

I remember with my first one, my husband was very embarrassed. We were sitting in this restaurant and I started feeding and he put this blanket over me. I said 'What are you doing? . . .It's obvious now what I am doing' and he was really embarrassed. (Mothers group)

The male university students considered it appropriate, under certain conditions, for women to breast-feed in public. In particular if the child demanded to be fed, it was preferable to breast-feed the child than to let the child cry and annoy other people.

I'd much rather someone fed it, than have to listen to it during a movie, theatre or while we were having dinner. (Students group)

However, amongst this group there were some who thought that while it was acceptable on public transport, where there was no other alternative, it was less acceptable in a public place such as a restaurant. Several believed that if facilities were available, for example a restroom or toilet, that the mother should leave the group and breast-feed in private.

. . . the one on the bus, I mean she had no choice. She can't go anywhere else if she's on the bus - but at the cafeteria . . . she could go somewhere else.'(Students group)

Other students considered it inappropriate for a woman to have to breast-feed in a toilet. Fathers, in particular, were likely to object to their wives having to breast-feed in the toilet.

Adolescent girls were least likely to approve of breast-feeding in public and while most said they would like to breast-feed their future children, they indicated that they would bottle-feed when in public, as breast-feeding was *embarrassing*. Their opinions expressed in response to the photo of the woman discreetly breast-feeding on a bus ranged from disgust to approval and support.

That is just so shameful. That's the worst. (Girls group)

I don't think it's embarrassing and if anyone else doesn't like it, they don't have to watch. (Girls group)

When asked if it would be appropriate to breast-feed on the bus if the baby was 'screaming', most girls still indicated that it was inappropriate and that the mother should be prepared with a bottle.

. . . but she should have brought a bottle - they should know when the child gets hungry. And, when you have a baby - you shouldn't take it on the bus anyway. (Girls group)

Others were less 'offended' by this scenario, but nevertheless, would still be embarrassed to breast-feed their own child on a bus.

If I saw someone doing it, I wouldn't mind - but me personally, it's too open. (Girls group)

Adolescent girls were inclined to think that a woman should find *somewhere else* to breast-feed. In response to the photo of the woman breast-feeding at the cafeteria, several thought that the act of breast-feeding would put other people off their food. When presented with the possibility of there being no nursing rooms available a number of girls suggested that the mother retire to

the toilet. Even then, several indicated that they still wouldn't like to breast-feed in the toilet if other women were present.

A number of mothers suggested that they had no alternative but to breast-feed in public because of a lack of facilities. Other mothers had resorted to breast-feeding in the toilet rather than breast-feed in public.

What else can you do if the baby is screaming hungry, in a restaurant or in a hotel or something. (You) go to the toilet, sit down on the lid and feed the baby. Where else are you going to do it?

Morse (1989) explored the possibility that breast-feeding women are banished to the toilet because breast-feeding is considered to be an 'excretory function and breast milk is considered dirty and defiling'. It seems incongruous that while most people would bristle with horror at the thought of eating or drinking in the toilet, they accept and even promote breast-feeding in a toilet as being a suitable alternative to breast-feeding in public.

4.4.2 Breast-feeding in mixed company

There was a general feeling amongst the adolescent girls that a woman shouldn't breast-feed in mixed company, even in a private home with friends and family. However, a few thought it would be appropriate to breast-feed in front of *close friends or relatives*.

I would want to leave, I wouldn't want to do it in front of anybody. (Girls group)

They might be very close friends, they might have kids as well, then they (would) understand. (Girls group)

Most women who left a room to breast-feed in private did so out of concern for other people's feelings rather than out of self-embarrassment. Other

women chose to retire to another room because once their child reached a certain age they tended to be distracted by the presence of other people.

Unlike the mothers studied by Jones (1986) who were generally embarrassed to breast-feed in front of others, especially men, women in this study were not particularly embarrassed to breast-feed in public or in mixed company. However, they were sensitive to the feelings of others and recognised that men, in particular, might be embarrassed or awkward in their presence. Mothers were in general quite happy, and in several instances preferred, to use nursing rooms, if available. Especially if their infant tended to be distracted by the presence of other people. However, in many instances these rooms were either non-existent, inadequate or difficult to find.

4.4.3 Discreet breast-feeding

A strong theme to emerge from all groups was the issue of 'discreet' breast-feeding. With the exception of adolescent girls, there was a general acceptance of women breast-feeding in public as long as it was performed discreetly, that is with a minimum of the breast showing.

> *. . . it's not really noticeable. A lot of women feed and half the time you don't know that they are doing it anyway. You could be walking past and have no idea if they are being discreet about it. (Students group)*

Overt public displays of breast-feeding were not considered socially acceptable by any of the groups interviewed. Even the NMAA members and counsellors, a group most likely to defend a woman's right to breast-feed in public, did not support the idea of indiscreet breast-feeding. Suggesting that such behaviour did not give breast-feeding a *nice image*. This suggests that women who breast-feed in public in a conspicuous fashion, that is with their breasts overly exposed, will do little to advance the social acceptance of breast-feeding in public.

Most groups had a similar reaction when shown the photo of the woman breast-feeding at home with her robe open. They considered it appropriate for home but inappropriate to show as much breast when in public.

If you saw that in a public place you'd have every male in the population checking it out. It's not discreet and you're advertising. That's when . . . you'd create a commotion . . . (Fathers group)

The reaction of the university students to the photo of a mother breast-feeding in an open robe which exposed both her breasts suggested that while this may be appropriate in the privacy of her own home, it was definitely not socially acceptable in a public place.

I don't think it's really socially acceptable to show everything in public like that. If you're in some other culture where they walk around without any tops on or something like naked, then that would be all right. But I think in our culture, it's not really socially acceptable. (Students group)

'Indiscreet' breast-feeding was associated by some university students with 'left-wing radicals', 'greenies'[1] and feminists.

If I saw that in public, I would assume that she is just a little left wing and a little radical, and if she's going to feed the baby, she doesn't care what people think, and that's her prerogative. (Students group)

A second photo of a woman 'discreetly' breast-feeding in public received general approval, with the exception of adolescent girls.

I mean she is totally covered up. ... You wouldn't even know unless you stare. (Mothers group)

[1] An Australian slang term usually used to describe a committed conservationist or someone living an alternative lifestyle. In this context it is used disparagingly.

4.4.4 Embarrassment with witnessing breast-feeding

Many of the male university students indicated that while they were not offended by the sight of a woman breast-feeding, they did experience a degree of embarrassment or awkwardness. They were less likely to feel embarrassed if they felt that the mother was comfortable with breast-feeding in front of them.

> *If you know that she is shy and that she doesn't like to do it - then you would feel embarrassed. If you get on the bus and you see a woman breast-feeding, you naturally think, well she doesn't mind so I don't have to worry about looking in that direction. (Students group)*

Several of the adolescent girls also indicated that they felt embarrassed when witnessing a woman breast-feed, or with being in the company of a woman who was breast-feeding in public, even if they were doing so discreetly.

> *I would feel uncomfortable for them. It wouldn't bother me, (but) I would think 'Oh, my god', everybody is going to start looking at her. (Girls group)*

There was general consensus amongst the mothers and the fathers that others were more embarrassed at the sight of a woman breast-feeding than the mother actually was with breast-feeding in front of people.

> *I find most of the time when you are breast-feeding, it is always the other people that get more embarrassed than the person that's feeding. (Mothers group)*

Some mothers and fathers thought that older people were more likely to be embarrassed than younger people.

> *Apparently it's the older generation that don't appreciate it. My parents wouldn't let me breast-feed in front of their friends. (Mothers group)*

While most mothers thought that they would be embarrassed breast-feeding in public before they had their baby, they noted that they weren't embarrassed once they had done so for the first few times.

I thought I would be embarrassed when I first started feeding - granted I was embarrassed the first few days and then I just got over it. (Mothers group)

Adolescent girls were the group least comfortable with either the idea of witnessing a woman breast-feed in public, or with being in the company of a woman who was breast-feeding in public, even if they were doing so discreetly. This reaction was similar to that described in studies from other Western countries, and in general, adolescents do not consider breast-feeding in public to be socially acceptable. Canadian teenagers (Ellis 1983) were slightly more liberal than English teenagers, (Gregg 1989) but still did not consider it appropriate to breast-feed 'on the bus', in 'restaurants', 'the park', or 'at the shops'. In their view, breast-feeding should be confined to the privacy of the home. In both the Canadian and English groups, acceptance decreased as the presence of others, especially males was added to the scene. Male university students in this study also felt awkward in the presence of a breast-feeding woman, but recognised their right to breast-feed in public. Their embarrassment was minimised if they were in some way forewarned that the mother was going to breast-feed in their presence.

4.4.5 Breast-feeding etiquette

Another common theme which emerged from the two focus groups with university-students was the concept of *breast-feeding etiquette*. They acknowledged that while it was a woman's right to breast-feed in public that they were less embarrassed if the woman first asked their permission to breast-feed in front of them, or at least acknowledged that she was going to breast-feed in front of them.

I'd still expect her - if she was in someone else's home and the kid was screaming - I'd expect her to say "Is it all right if I feed?". (Students group)

However, fathers strongly resented the suggestion that a woman should ask permission to breast-feed.

It's nothing to do with the other people, it's her individual right that she is going to breast-feed. (Fathers group)

In one group, the adolescent girls scoffed at the idea of asking other people for permission to breast-feed. However, in the second group this was suggested as a way of establishing whether people were comfortable with a woman breast-feeding in their presence.

4.4.6 Sexual role of breasts versus functional role of breasts

The theme of the sexual versus the functional role of the breast was explored. Most young men agreed that their embarrassment at seeing a woman breast-feed stemmed from the sexual role of the breast. They, and the adolescent girls, acknowledged the incongruity of the two roles.

"Yeah, we pay to look sometimes and yet we object to women, or some people object to women, breast-feeding in public." (Students group)

In response to a question about how they would feel if their wife or girlfriend were to breast-feed in front of their friends, a number of the university students indicated that they wouldn't like it or that they would be embarrassed. Comments such as *'for my eyes only'* suggested a certain degree of territorialism or ownership of their partner's breasts.

A common theme that emerged amongst university students was their concern at being considered, by either the mother or their male friends, to be

'perving'[2] on the woman's breasts. Adolescent girls and a number of the mothers also thought that men were embarrassed because they might be thought to be perving or staring at the woman's breasts.

"They feel like a pervert, like even if they are not, they still feel it."
(Girls group)

4.4.7 Prolonged breast-feeding

When shown a picture of a toddler breast-feeding most of the recent mothers recruited from the shopping centres considered the child too old to be breast-fed.

I think generally it's not accepted - I don't care but I find a lot of people are very embarrassed, especially when the baby is older. (Mothers group)

A few mothers expressed very strong negative feelings towards the photo.

If it was a ewe that would be great, but I don't want a child at that age hanging off (my breast). (Mothers group)
I just think when they are old enough to say "Mummy, can I have it" - that they are too old for it. (Mothers group)

In general, fathers also thought that the child was too old to be still breast-fed, but recognised that it was the woman's right to continue to breast-feed. However, even the one father that said it didn't bother him felt that breast-feeding an older child in public might offend other people.

There was general consensus amongst the university students that up to 12 months was an appropriate length of time for a child to be breast-fed. After this age most expressed some concern over the appropriateness of breast-feeding toddlers, especially with regard to the effect that this might have on the psychological development of the child. Comments such as *that poor*

[2] An Australian slang verb derived from the word pervert. In this context it implies staring in a voyeuristic manner.

kid's going to have an enormous lot of trouble and *missing a step in the maturity process* were common.

Concern was also expressed by mothers and fathers that prolonged breast-feeding would make the child too dependent on the mother.

> *At that age it makes the child very reliant on their mother. I think children have to learn to be independent, otherwise you will always have to be there. (Mothers group)*

There was almost unanimous agreement amongst the adolescent girls that the child was too old to be breast-fed. Several thought that it would cause the child to be too dependent on the mother and were *disgusted* at the possibility of a woman breast-feeding an older child in public. *'By the time the child can walk* was generally agreed upon as an appropriate age by which a child should be weaned.

Several women negatively associated prolonged breast-feeding with the Nursing Mothers Association.

> *. . . your true blue sort of Nursing Mothers Association rep - like I know some of them breast-feed their children until they start school - which to me is taking it a bit too far. (Mothers group)*

There appears to be a culturally approved age by which time a child should have been weaned from the breast. This is not necessarily measured in terms of chronological age but is more related to a child's development. Most people thought that by the time a child can either walk, eat family foods or ask for the breast, - in short becomes an aware *person* - that s/he should have been weaned. Morse (1989) theorised that:

> *breast-feeding is a dynamic relationship involving significant others beyond the 'nursing couple', and the attitudes of these 'others' change toward the breast-feeding mother over the*

course of lactation. Initially these significant others support the mother in her breast-feeding. But when the infant is considered 'old enough to wean', these others also facilitate weaning.

4.4.8 Reasons for terminating breast-feeding

There was a perception amongst some mothers and fathers that some women terminated breast-feeding because they reached a stage where they had *done their bit* and it was now time to regain their life.

A lot of people get sick of it and within three or four months they feel they've done their bit and it's easier to just make up four bottles a day and just stick it in his mouth and the Mrs can walk out and do something else. (Fathers group)

It was also suggested that some women may switch to bottle-feeding because they are overwhelmed by the intimacy and responsibility of breast-feeding.

I know somebody who had a baby who she (breast)fed for about six weeks and she found the intimacy of feeding just so difficult to cope with. She changed over to bottle-feeding (because of) the dependence of the child - she was the only one who could do it (i.e. breast-feed). (NMAA group)

It was suggested that most women are unprepared for motherhood and breast-feeding and that early termination of breast-feeding might be due to unrealistic expectations about breast-feeding.

. . . expectations are sometimes unrealistic. You know, you go to have your six week check-up and . . . you're supposed to have everything under control, feel great, sex drive back - when really . . . by then the fatigue has started to hit and you're feeling the worst you've ever felt in your entire life - and you realise that this is one

hell of a mistake . . . but everyone thinks that everything should be all right.(NMAA group)

Members of the Nursing Mothers Association suggested that self-esteem contributed to successful breast-feeding.

Self-esteem is a very big factor, because it's amazing how many women do continue against incredible odds. It really goes back to their self-esteem.

4.4.9 Breast milk insufficiency

A number of mothers talked about giving up breast-feeding because of breast milk insufficiency. In most cases this was self-diagnosed.

I only breast-fed for two months for my first and second because the baby was waking up during the night and I was feeding every two hours, so obviously I didn't have enough milk. A soon as I put them both on formula they slept right through, so I thought well that was what was wrong. (Mothers group)

Members of the Nursing Mothers Association recognised breast-milk insufficiency as being a major concern for new mothers.

If they cry for any reason at all they think, "I wonder if I've got enough milk" . . . and when they're not sleeping through the night. (NMAA group)

Young mothers were particularly concerned with their baby's weight gain. They saw an advantage of bottle-feeding being that they knew exactly what their baby was getting.

For the first few weeks I keep taking them to the clinic to make sure they are putting on weight. (Mothers group)

In general, young mothers recruited from the shopping centres were more likely to think that breast milk insufficiency was a common problem compared with members of the NMAA.

Medical things tell you that it doesn't happen at all. But, that's a load of rubbish. (Mothers group)

4.4.10 Breast-feeding support

Most women had experienced situations where they received conflicting advice. Most agreed that while they listened to everyone they usually just went away and did what they thought was best.

Quite often they've got other people around them saying 'Do you think you've got enough milk?' and they're sowing the seeds of doubt in your mind all the time. (NMAA group)

It was common for mothers to be anxious about how well they were coping and how their baby was growing. Positive support and encouragement from professionals, family and friends and even strangers, was welcomed and valued. This was something that members of the NMAA tried to foster.

Perhaps, that's what a lot of us like about Nursing Mothers. I mean, we do recognise the need for that (support) and we try to encourage mothers and tell them they are doing the right thing.(NMAA group)

4.4.11 Pressure to breast-feed

Most mothers and members of the NMAA acknowledged that there was considerable societal pressure for women to breast-feed and that women that chose to bottle-feed were often made to feel guilty. Several women indicated that they either knew of women who, or themselves, had felt pressure from hospital staff to breast-feed.

They sort of get the looks. The nurses may not say anything, but! (NMAA group)

Everybody looks down their nose at you. It's like you're not a good enough mother because you can't breast-feed and it wasn't entirely my fault. (Mothers group)

Several groups commented on the contradictory nature of societal attitudes. On one hand women are made to feel guilty if they choose not to breast-feed their infant but on the other hand they are criticised or made to feel awkward about breast-feeding in public.

They put down mothers who don't try breast-feeding, you know mothers who give the bottle to the baby . . . (but when) the mother is doing the natural thing, they don't like it in public. (Fathers group)

I mean, you are told to breast-feed, so you've got to. But, they don't make it any easier for you in public. That's ridiculous. (Mothers group)

4.4.12 Adolescent girls' perceptions of the advantages and disadvantages of breast-feeding.

Amongst adolescent girls, knowledge of the advantages of breast-feeding ranged from the ignorant to well-informed.

I would breast-feed because it is healthier for the child, you get better bonding between mother and child, and it's more convenient - you don't have to worry about bottles. (Girls group)

There was general consensus that they wouldn't breast-feed if it hurt. There was also some concern and confusion over the effect of breast-feeding on the shape and size of breasts. Several girls thought that breast-feeding would be 'real easy' or come naturally. However, others thought that the baby would need to be taught how to breast-feed.

It was apparent that some girls held the belief that small children and going out were mutually exclusive, as suggested by the following statements:

And, when you have a baby - you shouldn't take it on the bus anyway. (Girls group)

I don't think they should take little children to restaurants anyway. (Girls Group)

This may explain why a number saw the primary advantage of bottle-feeding as being able to share the feeding responsibilities with someone else, for example the baby's father.

If you bottle-fed, you can palm your kid off onto somebody else. (Girls group)

Some mothers also saw bottle-feeding having the advantage of being able to involve the father in feeding the baby.

Yeah, once I started formula he didn't have an excuse for sleeping in while I'm up in the middle of the night. He got up and he helped, which was sort of good. And, he loved it because he was involved. (Mothers group)

4.5 Recommendations based on focus group discussions

While the rights of women to breast-feed in public should be recognised, nursing rooms should be provided for those women who wish to breast-feed in private. However. it was apparent from the discussions that these facilities were often unavailable, inadequate or difficult to find. Public places frequented by women and families with young children, for example family restaurants, cinemas, department stores and shopping complexes, should provide attractive, well maintained and easy to locate facilities where mothers can breast-feed in private, should they choose to. Town planners should consider the needs of breast-feeding women when approving building plans for major public venues and require (or at least advocate for) the inclusion of nursing rooms. These rooms may be adjacent to, but should be separate from

the female toilets. However, even if these facilities are provided, it should be recognised that breast-feeding intervals are not always predictable and that seclusion might be neither convenient nor possible, at the time the infant demands to be fed.

Teenage girls and boys, while recognising the benefits and importance of breast-feeding, often experience embarrassment and awkwardness when witnessing a woman breast-feed. They are inclined to think that women should isolate themselves rather than breast-feed in public. This attitude if carried into adult years may result in the early discontinuation of breast-feeding. This group should be the target of school-based breast-feeding education programs. Classes should deal with the sexual and social aspects of breast-feeding as well as the nutritive and protective roles. Discussions and breast-feeding demonstrations should be incorporated into health education, home economics and life skills curricula.

It would seem that women everywhere doubt the adequacy of their breast milk and insufficient breast milk is the most commonly cited reason for early termination of breast-feeding (Hill 1992). In most cases women make a self-diagnosis of breast milk insufficiency on the basis that the baby cries, or does not appear satisfied, after nursing. This suggests an ignorance of the individuality of the breast-feeding experience. In very few cases is perceived breast milk insufficiency substantiated with evidence of infant growth failure (Hillervik-Lindquist et al. 1991). Breast-feeding education should address the issue of breast milk sufficiency and insufficiency (real and perceived) and anticipatory guidance should be provided to help mothers manage transient breast milk insufficiency should it occur.

4.6 Conclusions

It would appear that the awkwardness and embarrassment experienced by adolescent girls and young men in the presence of a breast-feeding woman diminishes for both sexes once they have children of their own. In these focus groups, both mothers and fathers of infants and young children were quite comfortable with the idea of a woman breast-feeding in public and generally viewed it as being natural and necessary rather than an offensive and socially unacceptable behaviour. This attitude needs to be adopted by the general public where breast-feeding should be seen as both socially desirable and acceptable.

5 Results - Univariate analysis of factors associated with the initiation and duration of breast-feeding

5.1 Breast-feeding Rates

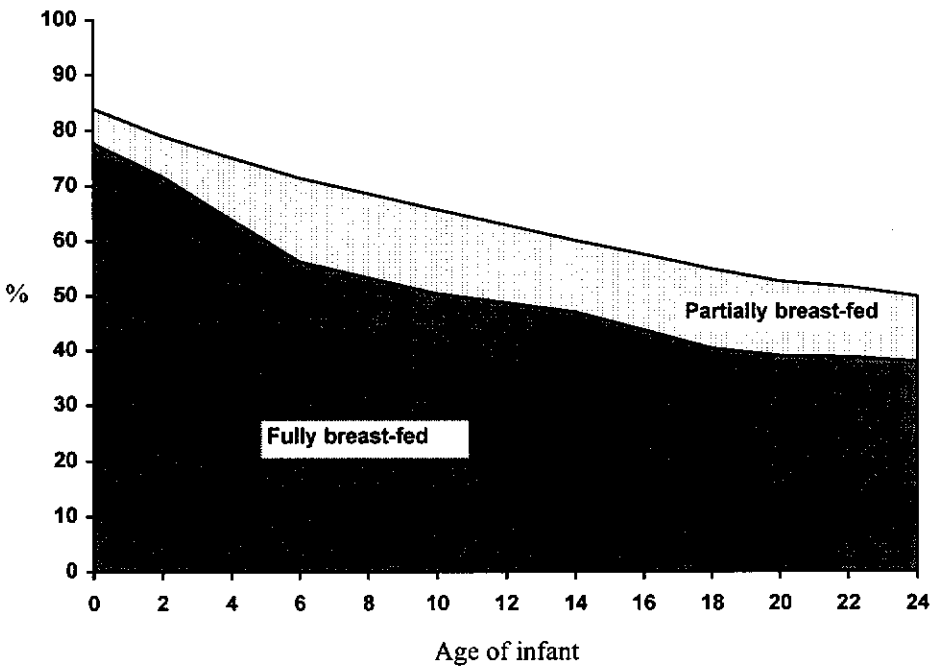
In total 490 women (88.1%) commenced breast-feeding whilst in hospital. On discharge from hospital 83.8% of participants were breast-feeding their infants, 77.7% were fully breast-feeding and 6.1% were using a combination of breast and bottle-feeding (Table 5.1 and Figure 5.1). By 10 weeks 65.6% of women continued to breast-feed, either fully or partially, and at six months this had fallen to 49.9%.

Table 5.1: Prevalence of breast-feeding from hospital discharge to 24 weeks

		Percentage of women breast-feeding		
Interview interval	n*	Fully	Partially	Total
At discharge	556	77.7	6.1	83.8
2 weeks	492	71.7	7.3	79.0
6 weeks	476	56.2	15.2	71.5
10 weeks	470	50.4	15.2	65.6
14 weeks	465	47.0	13.0	60.0
18 weeks	463	40.3	14.5	54.8
24 weeks	462	38.0	11.9	49.9

*64 Women chose to complete the baseline questionnaire but declined to participate in the follow-up phase of the study

Figure 5.1: Percentage of infants fully or partially breast-fed from discharge to 24 weeks



5.1.1 Number of mothers who had attempted to breast-feed

Of those who were artificially-feeding at discharge, more than one quarter had tried to breast-feed their infant whilst in hospital.

Table 5.2: Number of artificial-feeders who had initiated breast-feeding and reason for changing to artificial-feeding

	n	%
Had tried to breast-feed (n=90)		
No	64	70.0
Yes	24	26.7
No response	3	3.3
Reasons for changing to artificial feeding (unprompted)* (n=24)		
Breast-feeding too painful	6	25.0
Baby refused breast	6	25.0
Insufficient breast milk	4	16.7
Mother stressed or experiencing problems	4	16.7
Not confident with breast-feeding	3	12.5
Unable to position baby properly	3	12.5
Know how much milk baby is getting	2	8.3
Baby stressed	1	4.2

* Percentages may add up to more than 100 as respondents may have given multiple responses

5.2 Reasons for Choosing Feeding Method

Just over two third (70.0%) of mothers who were artificially-feeding at discharge had made no attempt to breast-feed. When prompted the most commonly cited reasons for not breast-feeding included 'father can help with feeding' (53.7%), 'dislike breast-feeding' (40.7%) and that 'bottle-feeding is easier' (38.9%) (Table 5.3). No women chose bottle-feeding ahead of breast-feeding because they thought that formula was better than breast milk or that breast-feeding would make their breasts sag. Ten mothers indicated that they had unsuccessfully tried to breast-feed at least one previous child. The number of reasons given for artificially-feeding ranged from zero to six, with the majority of mothers giving two or less reasons.

Table 5.3: Reasons for artificially-feeding from birth (n=64)

	n	%
Reasons (prompted)		
Father can help with feeding	29	53.7
Dislike breast-feeding	22	40.7
Bottle feeding is easier	21	38.9
Want to know how much baby is getting	18	33.3
Formula is just as good as breast milk	11	20.4
Returning to work soon after birth	9	16.7
Baby's father prefers bottle-feeding	2	3.7
Mother suggested bottle-feeding	2	3.7
Friend/ relative suggested bottle-feeding	1	1.9
Other reasons (unprompted)		
Previously unsuccessful	10	15.9
Too embarrassed	3	4.8
Inverted flat nipples	2	3.2
Not able to breast-feed twins	2	3.2
Breast too sore	1	1.6
Number of reasons given for bottle feeding		
No reasons	2	3.2
1 reason	23	36.5
2 reasons	15	23.8
3 reasons	13	20.6
4 reasons	7	11.1
5 reasons	2	3.2
6 reasons	1	1.6

* Percentages may add up to more than 100 as respondents may have given multiple responses

When asked why they chose to breast-feed, most women gave several reasons. The number of reasons for breast-feeding ranged from zero to 11, with the majority of women (60.1%) giving four or more reasons. Responses were fairly equally distributed across infant centred reasons such as 'better for the baby' and 'prevents allergies' and maternal centred reasons such as 'more convenient', 'cheaper' and 'helps weight loss' (Table 5.4).

Table 5.4: Reasons for initiating breast-feeding (n=466)

	n	%
Reasons (prompted)		
Breast milk is better for the baby	434	95.4
Breast-feeding is more convenient	344	75.6
Breast-feeding is cheaper	277	60.9
Breast-feeding prevents allergies	232	51.0
Breast-feeding helps weight loss	189	41.5
Breast-feeding is the right thing to do	136	29.9
Baby's father wanted me to breast-feed	114	25.1
My mother advised me to breast-feed	45	9.9
Other people advised me to breast-feed	33	7.3
Breast-fed babies are more intelligent	23	5.1
Breast-feeding is fashionable	4	0.9
Other reasons (unprompted)		
Breast-feeding promotes infant/mother bonding	27	5.8
Breast-feeding is natural	20	4.3
I wanted to breast-feed	10	2.1
I enjoy breast-feeding	9	1.9
Breast-feeding protects against infections	8	1.7
Breast-feeding helps the uterus contract	2	0.4
Other (miscellaneous)	4	0.8
Total number of reasons given for breast-feeding		
No reasons	3	0.6
1 reason	42	9.0
2 reasons	55	11.8
3 reasons	81	17.4
4 reasons	99	21.2
5 reasons	79	17.0
6 reasons	57	12.2
7 reasons	28	6.0
8 or more reasons	22	4.7

* Percentages may add up to more than 100 as respondents may have given multiple responses

5.3 Factors Associated with the Establishment of Breast-feeding

5.3.1 Association between socio-demographic factors and the establishment of breast-feeding at discharge from hospital

Table 5.5 lists socio-demographic factors that might be expected to have an influence on the establishment of breast-feeding at discharge from hospital. The numbers and percentage of breast-fed infants for each factor are given. The univariate odds ratios indicate the likelihood of being breast-fed at discharge. Lower paternal occupational status and the mother being either of British or Asian ethnic background were associated with an increased risk of not establishing breast-feeding at discharge from hospital.

Table 5.5: Association between socio-demographic factors and breast-feeding at discharge from hospital

	Breast-fed at discharge†				Univariate odds ratio‡ (95% CI)	
	Yes	(%)	No	(%)		
Age (years)						
<25	139	(85.3)	24	(14.7)	1.19	(0.67, 2.12)
25-29	160	(82.9)	33	(17.1)	1.00	
30-34	113	(83.7)	22	(16.3)	1.06	(0.59, 1.91)
35+	50	(83.3)	10	(16.7)	1.03	(0.48, 2.24)
Years of education						
<12	278	(81.5)	63	(18.5)	1.00	
12+	172	(86.9)	26	(13.1)	1.50	(0.91, 2.46)
Marital status						
Married/Div/Sep	335	(84.2)	63	(15.8)	1.00	
De facto	99	(83.9)	19	(16.1)	0.64	(0.28, 1.46)
Never married	27	(77.1)	8	(22.9)	0.98	(0.56, 1.72)
Mother's occupation						
Professional/ Admin	55	(90.2)	6	(9.8)	1.00	
Sales/ Clerical	121	(83.4)	24	(16.6)	0.55	(0.21, 1.42)
Trades/ Labourer	51	(86.4)	8	(13.6)	0.70	(0.23, 2.14)
Other #	198	(81.9)	44	(18.2)	0.49	(0.20, 1.21)

Includes those who gave their occupation as housewife or home duties
†The total of the categories do not always add up to 566 due to missing or incomplete data for some items ‡ The univariate odds ratio indicates the likelihood of being breast-fed at discharge
*p <0.05 **p <0.01 ***p <0.001

Table 5.5 cont.: Association between socio-demographic factors and breast-feeding at discharge from hospital

	Breast-fed at discharge†				Univariate odds ratio‡ (95% CI)	
	Yes	(%)	No	(%)		
Father's occupation						
Professional/ Admin	89	(89.9)	10	(10.1)	1.00	
Sales/ Clerical	34	(82.9)	7	(17.1)	0.55	(0.19, 1.55)
Trades/ Labourer	257	(81.1)	60	(18.9)	0.48	(0.24, 0.98)*
Other	45	(93.8)	3	(6.3)	1.68	(0.44, 6.43)
Mother's country of birth						
Australia/ NZ	360	(86.3)	57	(13.7)	1.00	
UK/ Eire	64	(76.2)	20	(23.8)	0.52	(0.28, 0.90)*
Asia	20	(66.7)	10	(33.3)	0.32	(0.14, 0.71)**
Other	17	(85.0)	3	(15.0)	0.90	(0.25, 3.16)
Family income						
<$15 000	94	(87.9)	13	(12.1)	1.61	(0.71, 3.65)
$15 001 - $25 000	121	(85.2)	21	(14.8)	1.28	(0.61, 2.69)
$25 001 - $40 000	135	(83.9)	26	(16.1)	1.15	(0.56, 2.30)
≥$40 001	63	(81.8)	14	(18.2)	1.00	

†The total of the categories do not always add up to 566 due to missing or incomplete data for some items ‡ The univariate odds ratio indicates the likelihood of being breast-fed at discharge
*p <0.05 **p <0.01 ***p <0.001

5.3.2 Association between biomedical factors and the establishment of breast-feeding at discharge from hospital

Table 5.6 lists biomedical factors that have been suggested in the literature to have an influence on the establishment of breast-feeding at discharge from hospital. In this study, none of the biomedical factors investigated were significantly associated with the establishment of breast-feeding at discharge.

Table 5.6: Association between biomedical factors and breast-feeding at discharge from hospital

	Breast-fed at discharge†				Univariate odds ratio‡ (95% CI)	
	Yes	(%)	No	(%)		
Parity						
Primiparous	149	87.6	21	12.4	1.00	
Multiparous	314	82.0	69	18.0	0.64	(0.38, 1.08)
Infant sex						
Male	225	83.0	46	17.0	1.00	
Female	241	84.6	44	15.4	1.12	(0.71,1.12)
Infant birth weight						
< 2500g	18	72.0	7	28.0	1.00	
≥ 2500g	448	84.4	83	15.6	2.10	(0.85, 5.18)
Infant admitted to Special Care Nursery						
Yes	65	77.4	19	22.6	1.00	
No	381	85.4	65	14.6	1.71	(0.96, 3.04)
Method of delivery						
Vaginal	384	84.6	70	15.4	1.00	
Caesarean	78	80.4	19	19.6	0.75	(0.43, 1.31)
Mother received pain relief						
Yes	283	84.5	52	15.5	1.00	
No	113	84.3	21	15.7	0.99	(0.57, 1.72)

† The total of the categories do not always add up to 566 due to missing or incomplete data for some items ‡ The univariate odds ratio indicates the likelihood of being breast-fed at discharge
*p <0.05 **p <.01

5.3.3 Association between hospital practices and the establishment of breast-feeding at discharge from hospital

Table 5.7 lists hospital practices identified in the literature as being associated with on the establishment of breast-feeding at discharge from hospital. Women who had roomed-in were more likely (OR 2.68) to have established breast-feeding compared with women who had not had their infants with them on a 24 hourly basis. Similarly women who had been encouraged to put their infant to the breast immediately after birth or to demand feed were more likely (OR 5.85 and OR 3.82, respectively) to have established breast-feeding at discharge. While there is a strong association between these hospital practices and the establishment of breast-feeding the direction of the relationship cannot be determined in this study. As all mothers were given the opportunity to have their infants room-in, the association may simply reflect that more breast-feeding mothers chose to room-in than mothers who bottle-fed and that breast-feeding mothers are more likely to be encouraged to demand feed than bottle-feeding mothers. Similarly, as women are asked how they intend to feed their infant at their 'booking-in' interview, it is unlikely that women who had nominated bottle-feeding would have been encouraged to put their infant to their breast in the delivery room.

Table 5.7: Association between hospital practices and breast-feeding at discharge from hospital

	Breast-fed at discharge†				Univariate odds ratio‡ (95% CI)	
	Yes	(%)	No	(%)		
Roomed-in 24 hrs/day						
No	321	80.7	77	19.3	1.00	
Yes	145	91.8	13	8.2	2.68	(1.44, 4.97)**
Staff encouraged early infant to breast contact						
No	162	71.4	65	28.6	1.00	
Yes	277	93.6	19	6.4	5.85	(3.39, 10.10)***
Staff encouraged demand feeding						
No	91	69.5	40	30.5	1.00	
Yes	356	89.7	41	10.3	3.82	(2.33, 6.25)***
Attended antenatal classes						
No	300	85.0	53	15.0	1.00	
Yes, this or a previous pregnancy	162	81.4	37	18.6	1.29	(0.81, 2.05)
Received enough help and information from staff						
No	17	85.0	3	15.0	1.00	
Yes	436	84.2	82	15.8	0.94	(0.27, 3.27)

†The total of the categories do not always add up to 566 due to missing or incomplete data for some items ‡ The univariate odds ratio indicates the likelihood of being breast-fed at discharge
*p <0.05 **p <0.01 ***p <0.001

5.3.4 Association between psycho-social factors and the establishment of breast-feeding at discharge from hospital

Table 5.7 lists psycho-social factors identified in the literature as being associated with the establishment of breast-feeding at discharge from hospital. Women who reported that their partners had a definite preference for breast-feeding were more likely (OR 10.80) to have established breast-feeding than women whose partners were reported as either preferring bottle-feeding or being ambivalent about the feeding method. Similarly, women who reported that their own mother had a stated preference for breast-feeding were more likely (OR 6.52) to have established breast-feeding at discharge. However, it is worth noting that relatively few of the women reported that their partners or mothers had a definite preference for bottle-feeding (3% and 2% respectively). Most partners and grandmothers were reported to be ambivalent, leaving the infant feeding decision up to the mother (53% and 69% respectively). Women whose own mother had breast-fed at least one child more likely (OR 2.06) to have established breast-feeding when compared with women whose mother had not breast-fed or who didn't know whether their mother had breast-fed a child.

There was also a strong association between the establishment of breast-feeding and when the feeding decision was made. Women who had chosen their preferred feeding method before pregnancy were more likely (OR 3.21) to have established breast-feeding than women who had made their decision either during the pregnancy or during or after labour.

Table 5.8: Association between psychosocial factors and breast-feeding at discharge from hospital

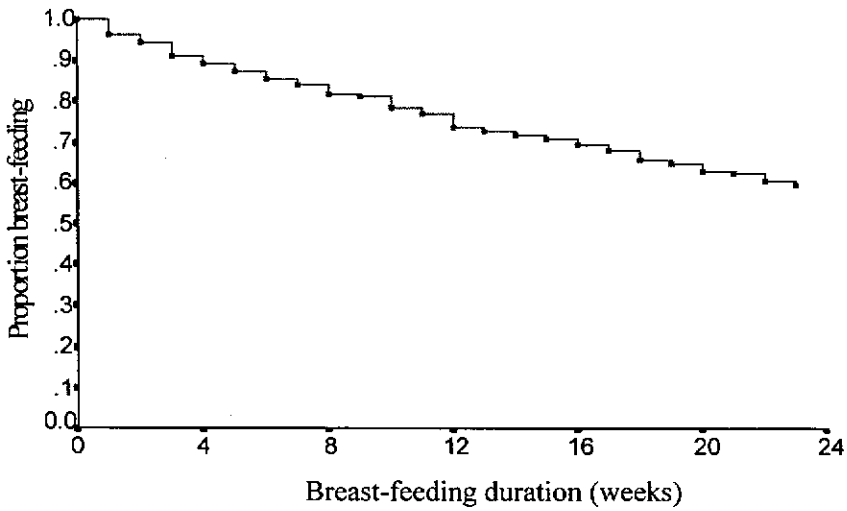
	Breast-fed at discharge†				Univariate odds ratio‡ (95% CI)
	Yes	(%)	No	(%)	
Father's reported feeding preference					
Prefers bottle or ambivalent	209	72.1	81	27.9	1.00
Prefers breast-feeding	251	96.5	9	3.5	10.81 (5.30, 22.04)***
Grandmother's reported feeding preference					
Prefers bottle or ambivalent	318	79.1	84	20.9	1.00
Prefers breast-feeding	148	96.1	6	3.9	6.52 (2.78, 15.26)***
Grandmother breast-fed at least one child					
No/ don't know	123	76.4	38	23.6	1.00
Yes	340	87.0	51	13.0	2.06 (1.29, 3.29)**
When decided on method of feeding					
During pregnancy or after labour	134	72.4	51	27.6	1.00
Before pregnancy	329	89.4	39	10.6	3.21 (2.02, 5.10)***

† The total of the categories do not always add up to 566 due to missing or incomplete data for some items ‡ The univariate odds ratio indicates the likelihood of being breast-fed at discharge
*p <0.05 **p <0.01 ***p <0.001

5.4 Duration of breast-feeding among breast-feeding women

Of the 466 women who were breast-feeding on discharge 60% were still breast-feeding at 24 weeks postpartum.

Figure 5.2:Duration of breast-feeding* among women who were breast-feeding at hospital discharge



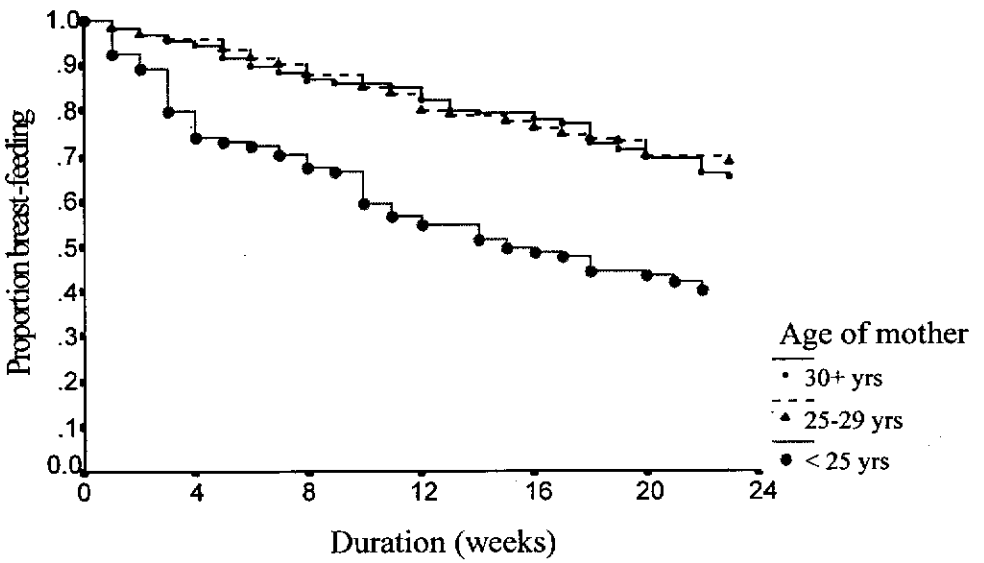
*Includes full and partial breast-feeding

5.5 Association between socio-demographic factors and breast-feeding duration

5.5.1 Age

Duration of breast-feeding was significantly associated with maternal age (Log rank X^2 33.34 df 2 p < .0000). At 24 weeks postpartum 68% of women aged 25-29 years were breast-feeding compared with 65% of women aged 30 years and over and 40% of women aged less than 25 years.

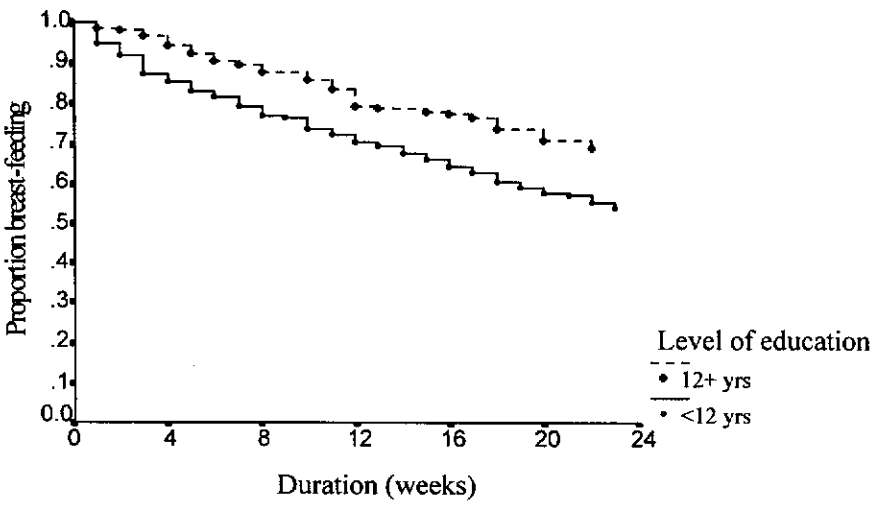
Figure 5.3: Association between maternal age and breast-feeding duration



5.5.2 Level of maternal education

There was a significant association between duration of breast-feeding and level of maternal education (Log rank X^2 9.55 df 1 p =.002). More women with 12 or more years of education (69%) were still breast-feeding at 24 weeks postpartum compared with women with less than 12 years of education (54%).

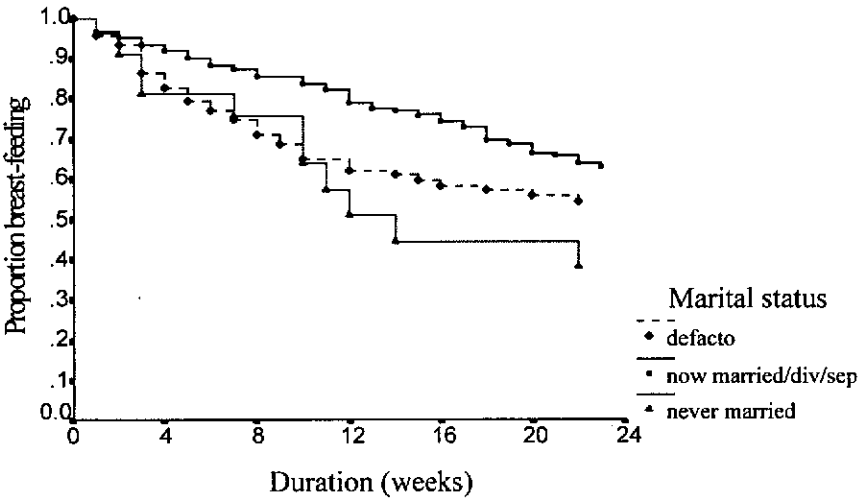
Figure 5.4: Association between maternal education and breast-feeding duration



5.5.3 Marital status

Duration of breast-feeding was significantly associated with marital status (Log rank X^2 8.40 df 2 p=.015). Fewer single women (38%) were still breast-feeding at 24 weeks postpartum compared with married women (63%) or women living in defacto relationships (54%).

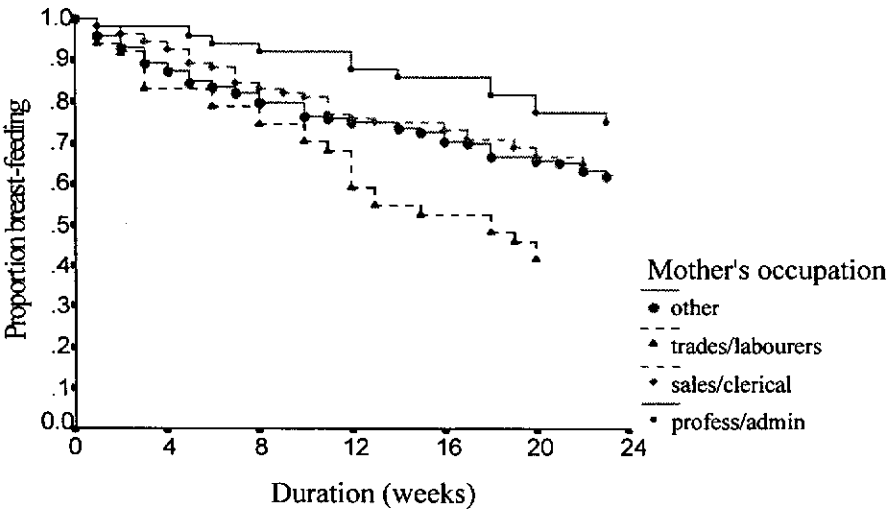
Figure 5.5: Association between marital status and breast-feeding duration



5.5.4 Maternal occupation

Breast-feeding duration was significantly associated with maternal occupation (Log rank X^2 13.72 df 3 p =.003). More women in professional and administrative occupations (75%) continued to breast-feed until at least 24 weeks postpartum compared with women in sales and clerical positions (65%), trade and labouring positions (42%) and 'other' occupations (62%). (N.B. women in 'other' occupations included those who gave their occupation as 'housewife' or 'home duties').

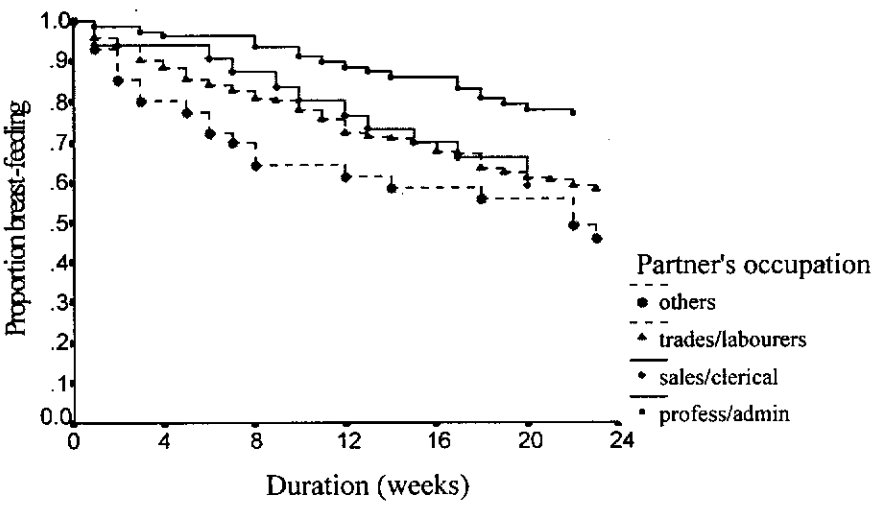
Figure 5.6: Association between mother's occupation and breast-feeding duration



5.5.5 Partner's occupation

There was a significant association between the partner's occupation and breast-feeding duration (Log rank X^2 14.00 df 3 p =.003). More women whose partner's were employed in professional or administrative occupations (77%) were breast-feeding at 24 weeks postpartum compared with women whose partners worked in trade and labouring occupations (58%), sales and clerical positions (59%) or 'other' occupations (46%). (N.B. men in 'other' occupation included those who were unemployed or described as being self-employed.)

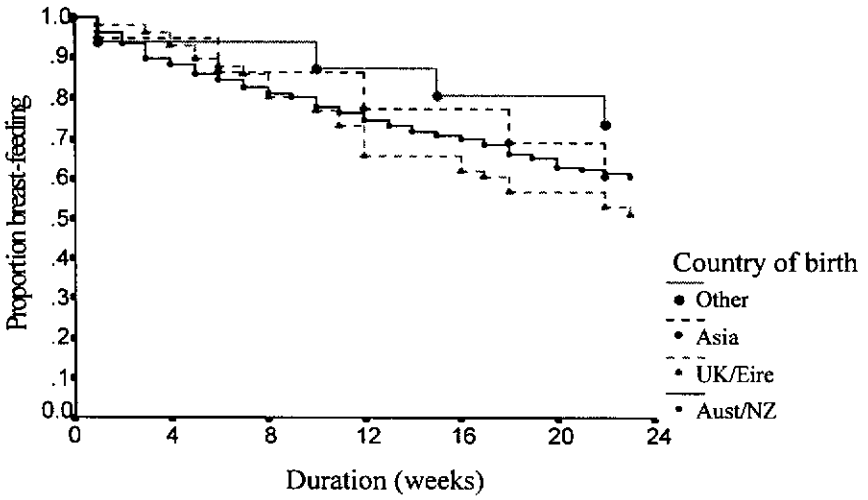
Figure 5.7: Association between partner's occupation and breast-feeding duration



5.5.6 Mother's country of birth

There was a trend for fewer UK born mothers (51%) to be breast-feeding at 24 weeks, compared with Australian born women (60%) and Asian born women (60%). However, there was no significant association between mother's country of birth and duration of breast-feeding (Log rank X^2 2.40 df 3 p =.494)

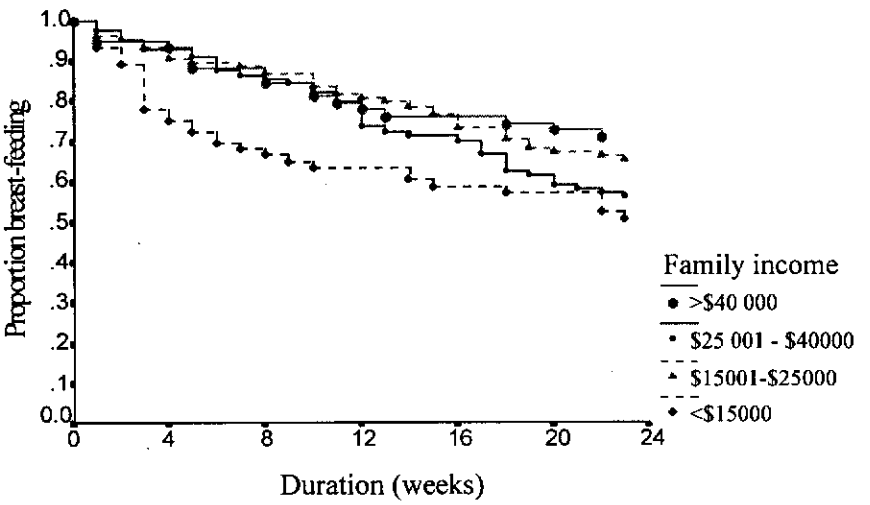
Figure 5.8: Association between mother's country of birth and breast-feeding duration



5.5.7 Family income

There was an association between total family income and duration of breast-feeding (Log rank X^2 8.80 df 3 p =.032). More mothers with a family income of greater than $40 000 (71%) were still breast-feeding at 24 weeks compared with women whose family income was $15 000 or less (50%), between $15 001 and $25 000 (65%) or between $25 001 and $40 000 (57%).

Figure 5.9: Association between family income and breast-feeding duration

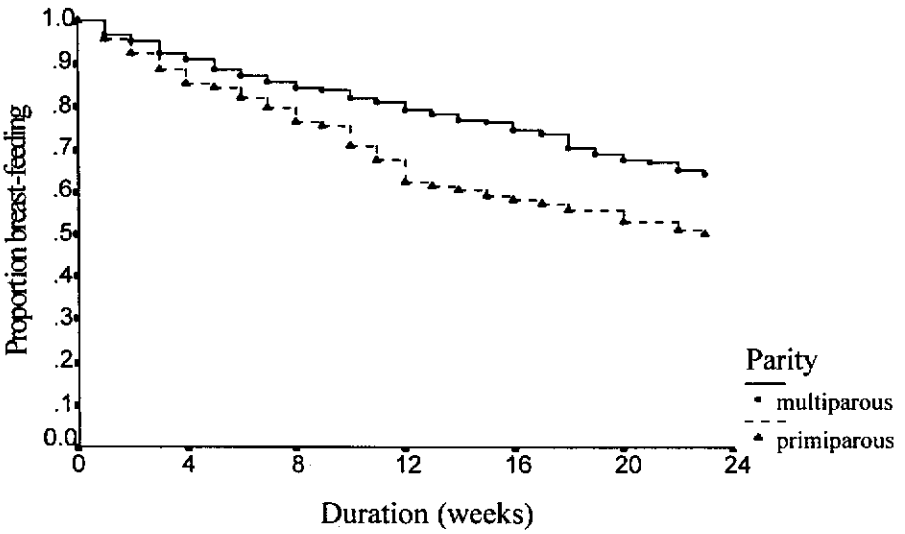


5.6 Association bteween biomedical factors and breast-feeding duration

5.6.1 Parity

There was a significant association between parity and breast-feeding duration (log rank X^2 8.13 df 1 p =.004). Fewer primiparous women (50%) were breast-feeding at 24 weeks compared with multiparous women (64%).

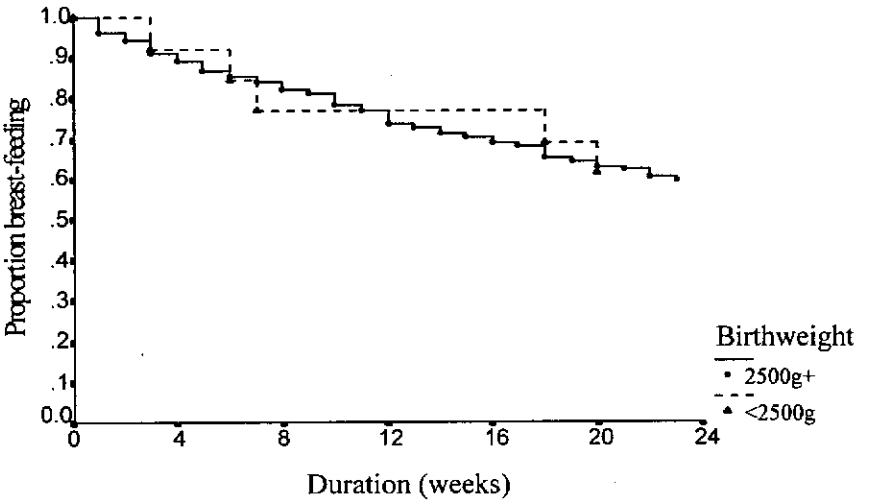
Figure 5.10: Association between parity and breast-feeding duration



5.6.2 Infant birth weight

There was no association between infant birthweight and duration of breast-feeding (Log rank X^2 0.06 df 1 p =.814). At six months 61% of low birth weight infants were being breast-fed compared with 60% of heavier infants.

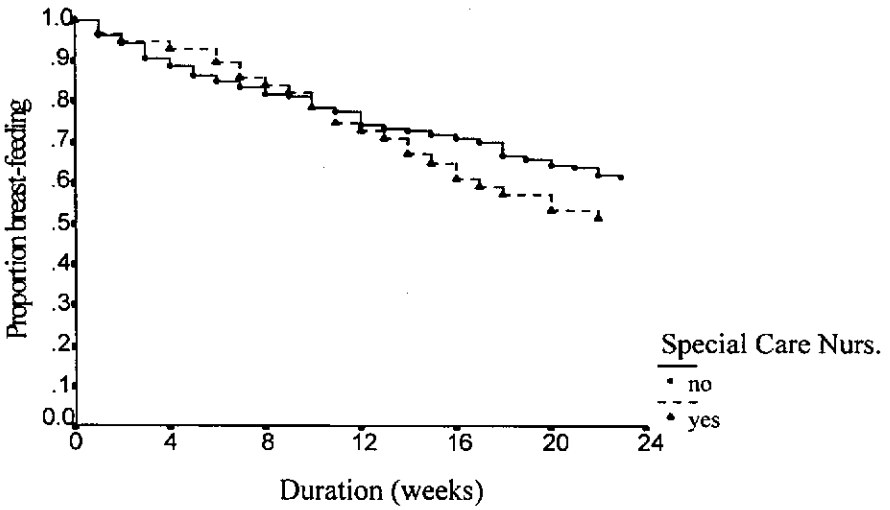
Figure 5.11: Association between infant birth weight and breast-feeding duration



5.6.3 Infant health prior to discharge

Whether or not an infant had been admitted to the Special Care Nursery (SCN) was used as a proxy for infant health in the early postpartum period. There was no association between breast-feeding duration and admission to the Special Care Nursery (Log rank X^2 1.32 df 1 p =.250). At six months 52% of infants who had been admitted to the SCN were being breast-fed compared with 61% of those who had not been admitted to the SCN.

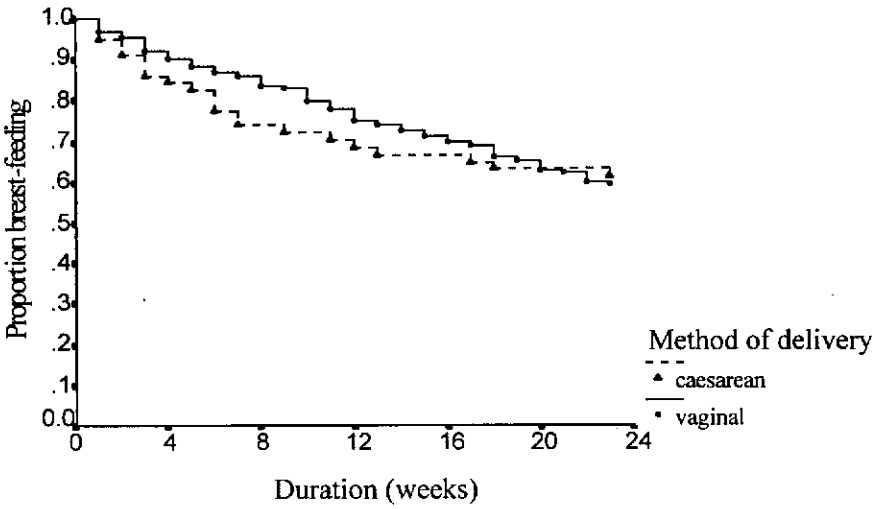
Figure 5.12: Association between infant health and breast-feeding duration



5.6.4 Method of delivery

There was no association between method of delivery and duration of breast-feeding (Log rank X^2 0.05 df 1 p =.817). Woman who had had a vaginal delivery (60%) were no more likely to be breast-feeding at 24 weeks than woman who had had a Caesarean section (61%).

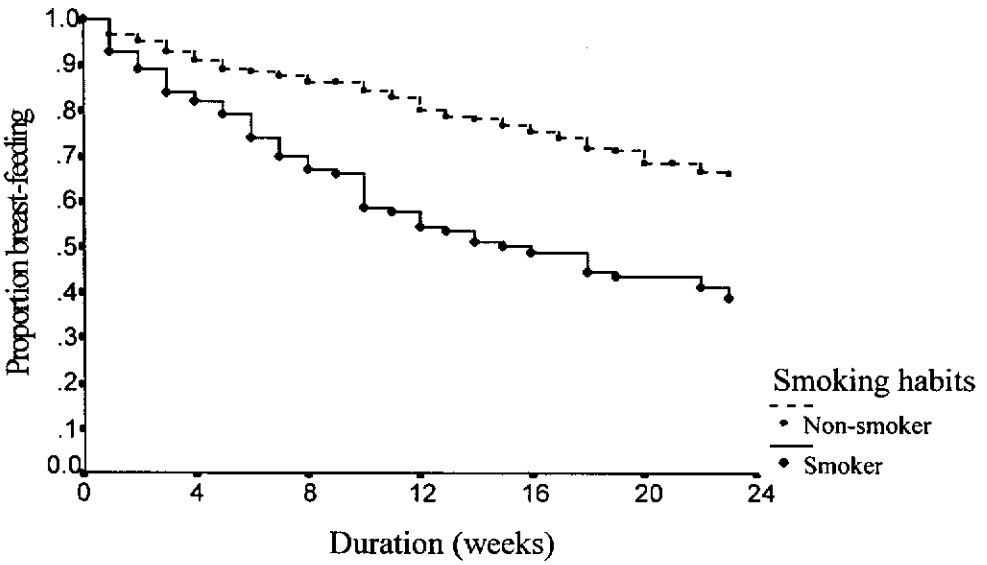
Figure 5.13: Association between delivery method and breast-feeding duration



5.5.5 Smoking

There was a significant association between maternal smoking habits and breast-feeding duration (Log rank X^2 = 28.79 df =1 p = .000) (Figure 5.14). Only 39% of smokers were still breast-feeding at 24 weeks compared with 66% of non-smokers.

Figure 5.14: Association between smoking and breast-feeding duration

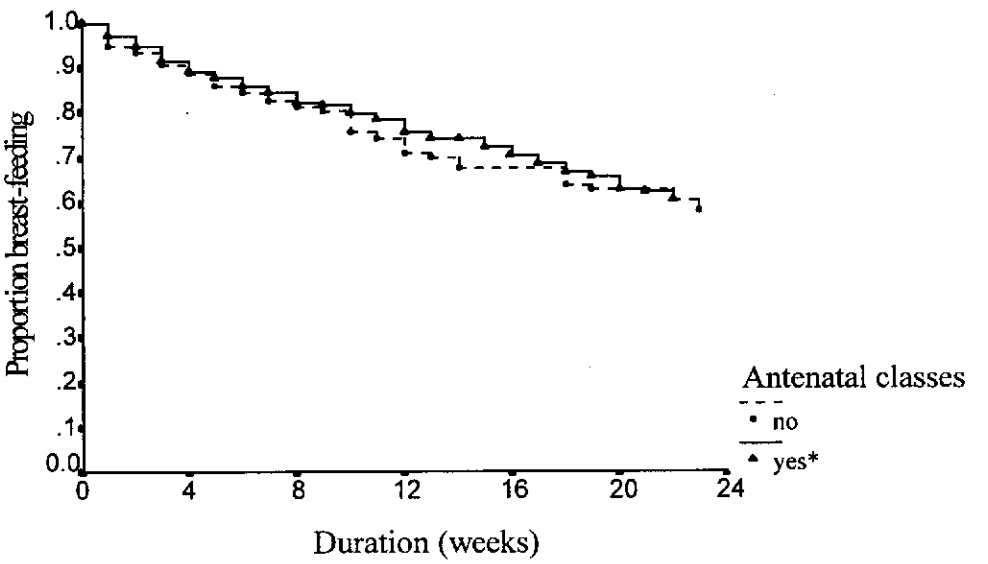


5.6 Association between hospital practices and breast-feeding duration

5.6.1 Attendance are antenatal classes

There was no association between attendance at antenatal classes and breast-feeding duration (Log rank X^2 = .41 df = 1 p = .524) (Figure 5.15). Women who had attended antenatal classes for this, or a previous pregnancy, were no more likely to be breast-feeding at 24 weeks, compared with women who had never attended antenatal classes (61% versus 58%).

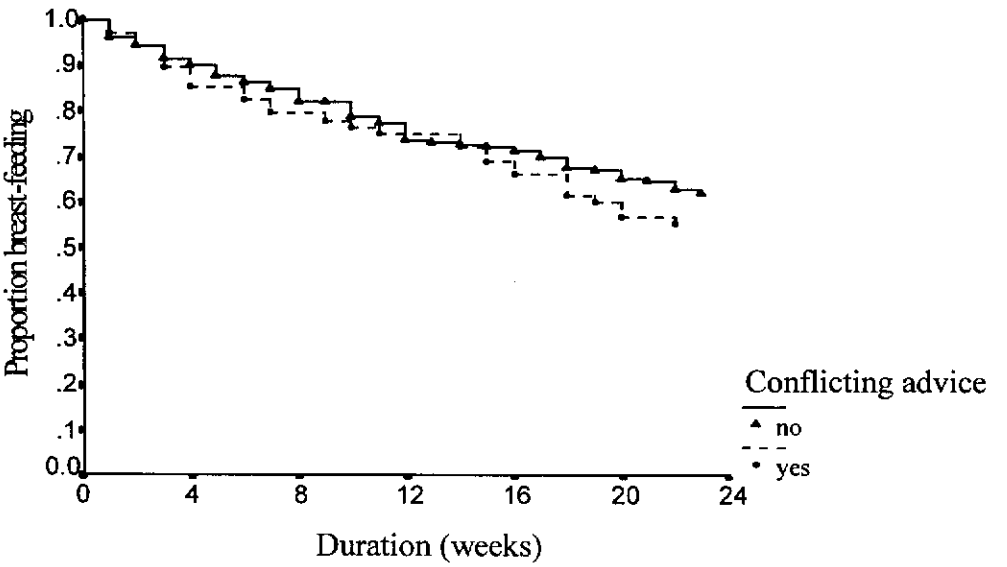
Figure 5.15: Association between attendance at antenatal classes and breast-feeding duration



5.6.2 Conflicting breast-feeding advice

Of the breast-feeding women, relatively few (17.3%) reported receiving conflicting advice regarding breast-feeding from nursing staff prior to discharge. There was no association between breast-feeding duration and whether a woman had received conflicting advice (Log rank $X^2 = .93$ df = 1 p = .334) (Figure 5.16). Slightly fewer women who reported receiving conflicting advice prior to discharge were breast-feeding at 24 weeks compared with women who had not received conflicting advice (55% versus 62%).

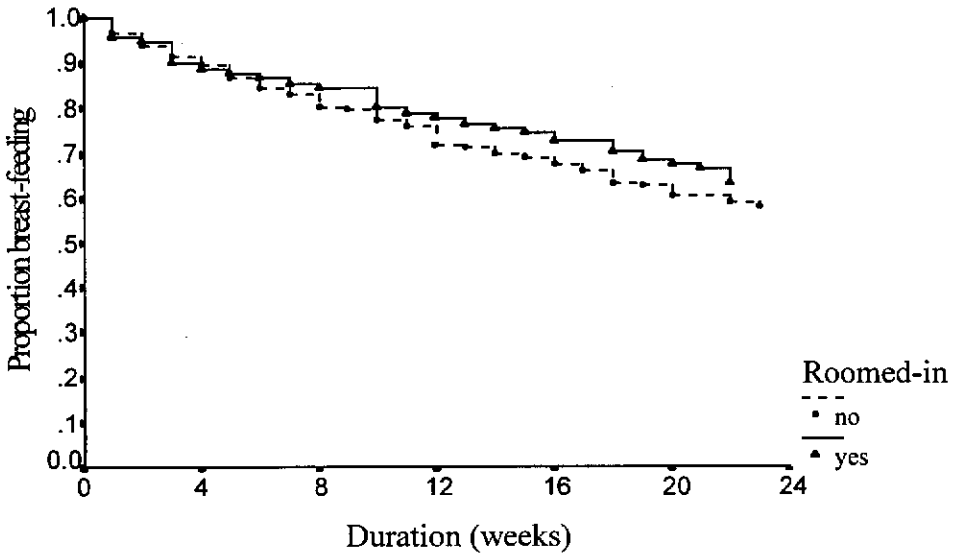
Figure 5.16: Association between conflicting advice and breast-feeding duration



5.6.3 Rooming-in

The practice of rooming-in was not associated with breast-feeding duration (Log rank X^2 = .91 df = 1 p = .339) (Figure 5.17). Women who had roomed-in were no more likely to be breast-feeding at 24 weeks when compared with women who had not roomed-in with their infant (63% versus 58%).

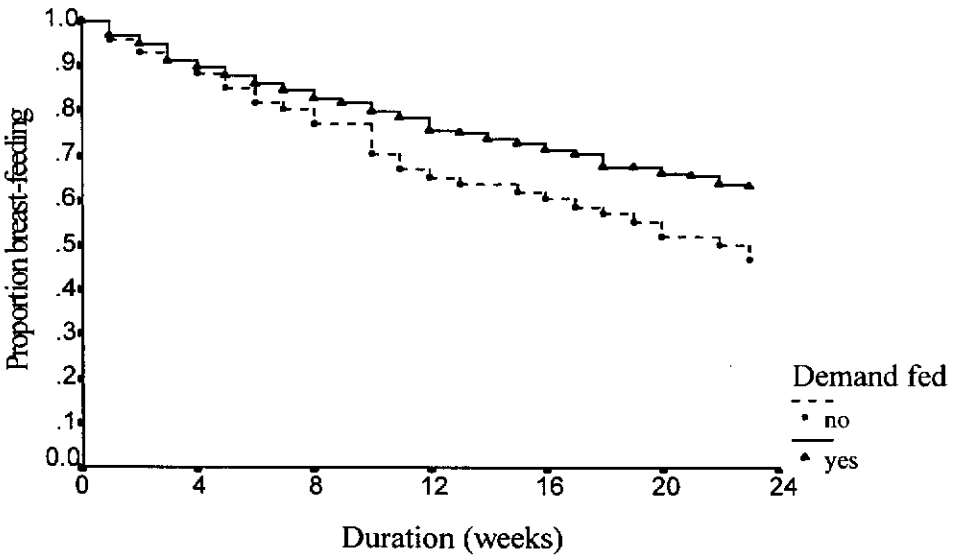
Figure 5.17: Association between rooming-in and breast-feeding duration



5.6.4 Demand feeding

Whether or not a woman was feeding on demand at discharge was significantly associated with duration of breast-feeding (Log rank $X^2 = 5.49$ df = 1 p = .019) (Figure 5.18). More women who breast-fed on demand (63%) were still breast-feeding at 24 weeks compared with 47% of women who were not breast-feeding on demand.

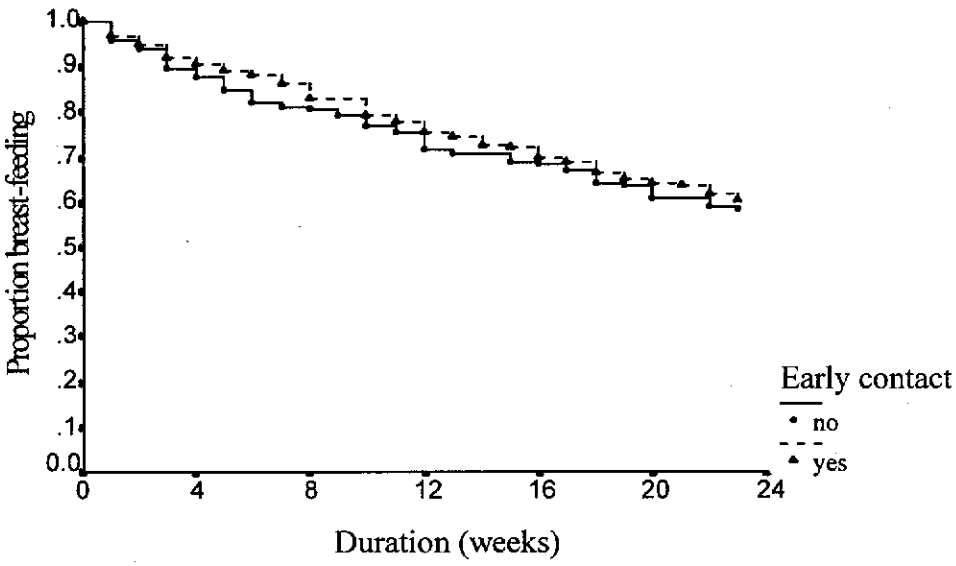
Figure 5.18: Association between demand feeding and breast-feeding duration



5.6.5 Early infant-to-breast contact

There was no association between early infant-to-breast contact and breast-feeding duration (Log rank X^2 = .34 df = 1 p = .562) (Figure 5.19). Women who had put their infant to their breast within 30 minutes of delivery were no more likely to be breast-feeding at 24 weeks than women who had delayed infant-to-breast contact (61% versus 58%).

Figure 5.19: Association between early infant-to-breast contact and breast-feeding duration



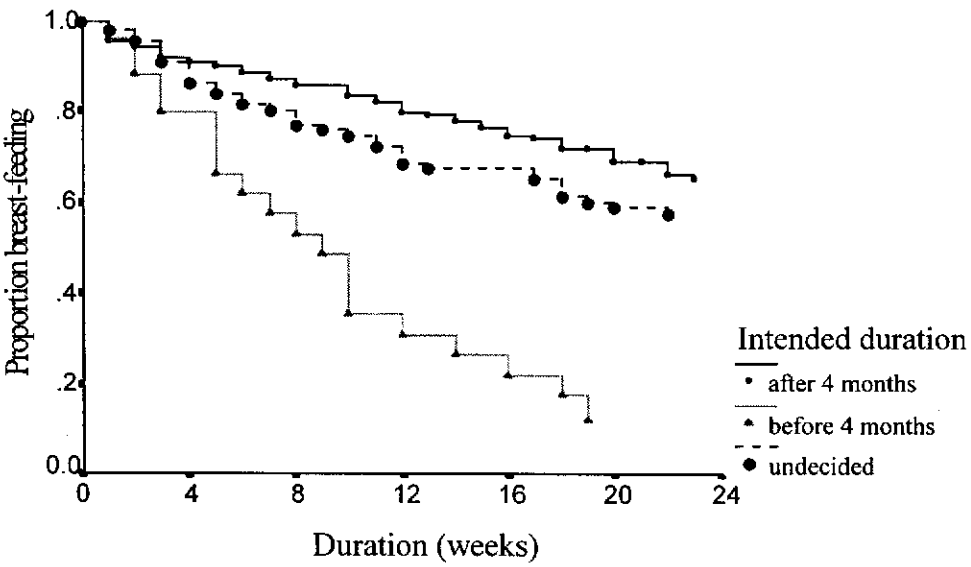
5.7 Association between psycho-social factors and breast-feeding duration

5.7.1 Intended duration

Intended duration was a significant predictor of breast-feeding duration (Log rank X^2 = 41.39 df = 2 p = .000) (Figure 5.20). Those mothers who intended to breast-feed for less than 4 months were significantly less likely to be breast-feeding at 24 weeks (11.4%) compared with women who intended to breast-feed for longer than four months (65%), or those who were undecided at discharge about how long they would breast-feed their newborn (58%).

It should be noted that relatively few women (n=30) were intending to breast-feed for less than the recommended minimum of four months, compared with 107 women who were undecided about their intended breast-feeding duration and 309 women who intended to breast-feed for four months or longer. Perhaps of greater interest is the number of women (35%) who intended to breast-feed for more than four months, but failed to attain their goal.

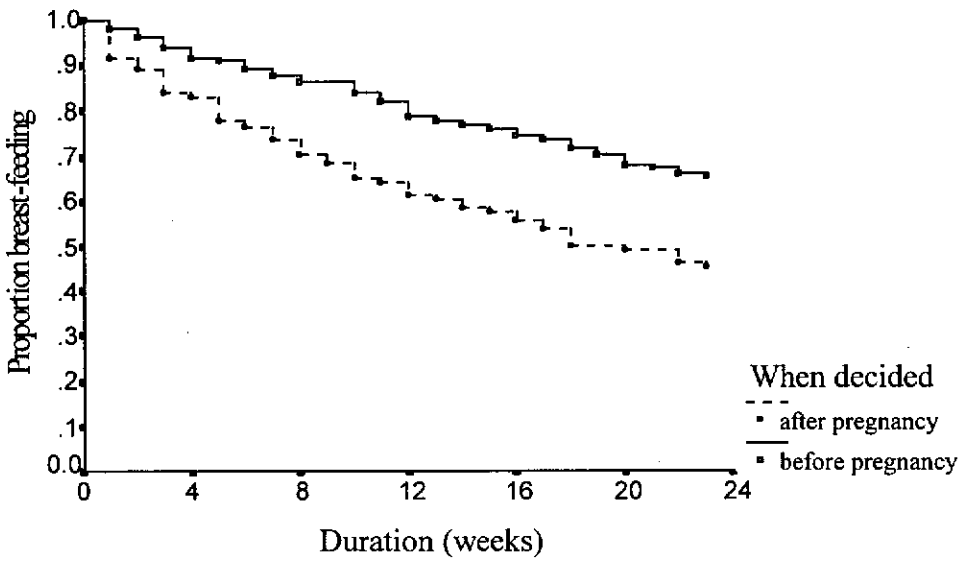
Figure 5.20: Association between intended duration of breast-feeding and actual duration of breast-feeding.



5.7.2 Timing of breast-feeding decision

Women who had chosen their method of infant feeding prior to becoming pregnant were significantly more likely to be breast-feeding at 24 weeks (66%) compared with women who made their decision after becoming pregnant (45%) (Log rank X^2 = 18.29 df = 1 p = .0000) (Figure 5.21).

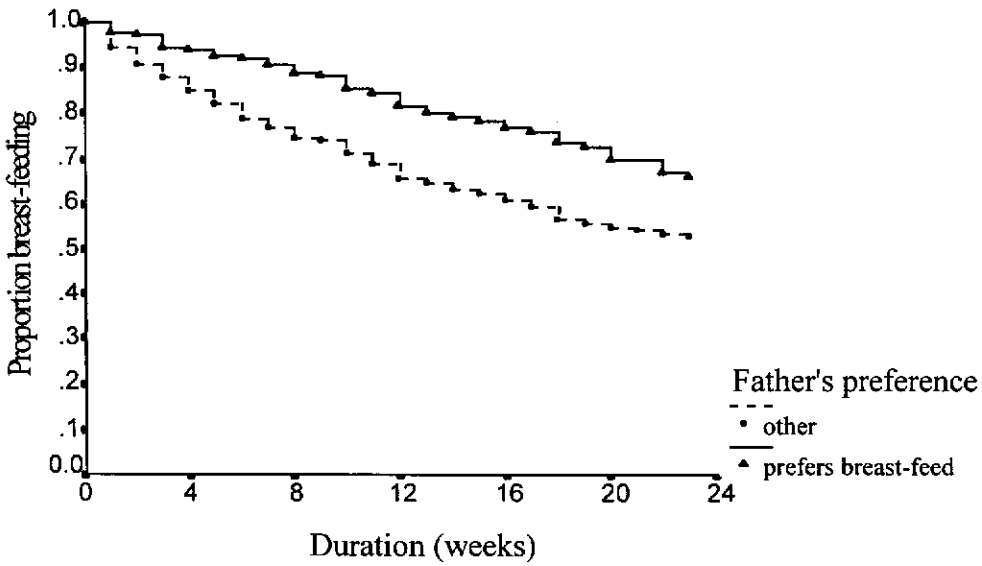
Figure 5.21: Association between the timing of the decision to breast-feed and breast-feeding duration



5.7.3 Father's attitude towards breast-feeding

Father's preferred method of feeding, as reported by his partner, had a significant effect on breast-feeding duration (Log rank X^2 = 10.03 df = 1 p = .002) (Figure 5.22). Women who perceived their partner to have a definite preference for breast-feeding were more likely to be breast-feeding at 24 weeks (66%) compared with women who thought that their partners either preferred bottle-feeding or were ambivalent about how they fed their infant (53%).

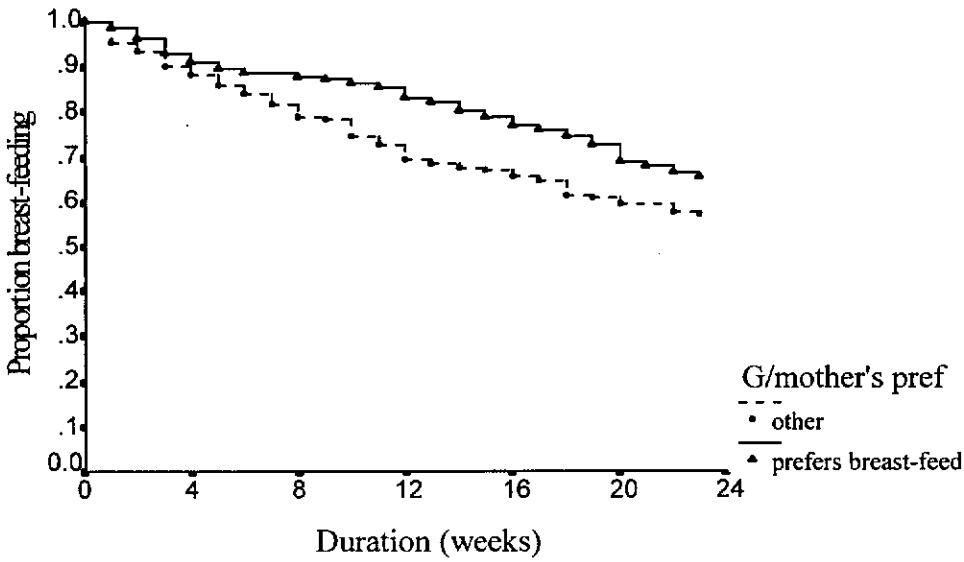
Figure 5.22: Association between father's attitude and breast-feeding duration



5.7.4 Maternal grandmother's attitude towards breast-feeding

Breast-feeding duration was not significantly associated with whether or not a woman perceived her own mother to prefer breast-feeding (Log rank X^2 = 3.69 df = 1 p = .055) (Figure 5.23). Although there was a trend for more women who perceived that their mothers preferred breast-feeding to be breast-feeding at 24 weeks (66%) compared with women who perceived their mothers to prefer bottle-feeding or to be ambivalent about how they fed their newborn (57%).

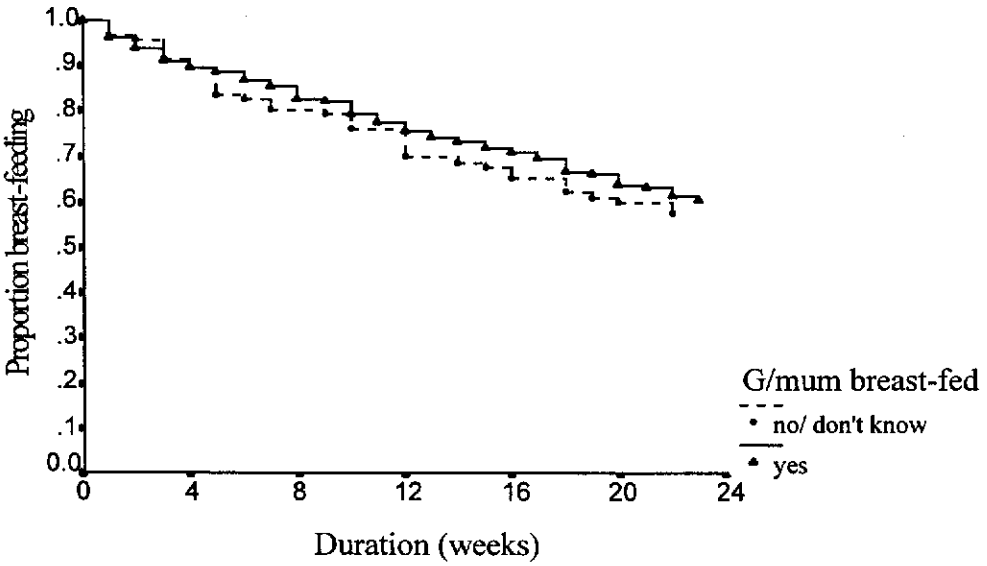
Figure 5.23: Association between maternal grandmother's attitude and breast-feeding duration



5.7.5 Maternal grandmother had breast-fed

There was no association between whether or not a woman's own mother had breast-fed had no influence and breast-feeding duration (Log rank X^2 = .32 df = 1 p = .572) (Figure 5.24). Women who own mother had breast-fed at least one infant were no more likely to be breast-feeding at 24 weeks (60%) compared with women who knew their mother had not breast-fed or who were unsure if their mother had breast-fed an infant (58%).

Figure 5.24:Association between whether the maternal grandmother had breast-fed and breast-feeding duration

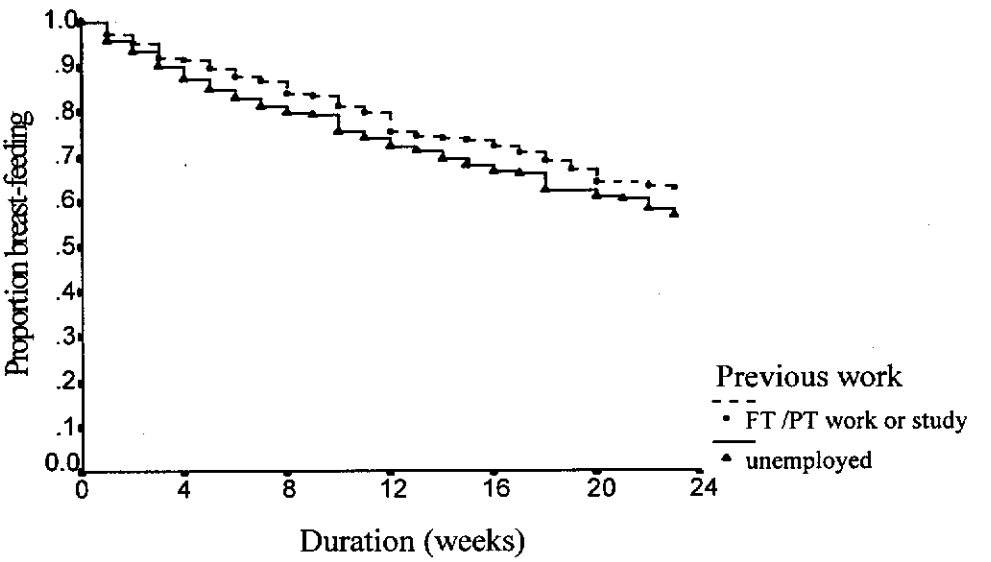


5.7.6 Employment status

Past employment status

Breast-feeding duration was not associated with a woman's employment status in the six months prior to the birth (Log rank X^2 = 1.61 df = 1 p = .204) (Figure 5.25). Roughly the same proportion of women who had been unemployed were still breast-feeding at 24 weeks when compared with women who had been working or studying on either a full or part-time basis (57% versus 63%).

Figure 5.25: Association between employment status in the six months prior to delivery and breast-feeding duration

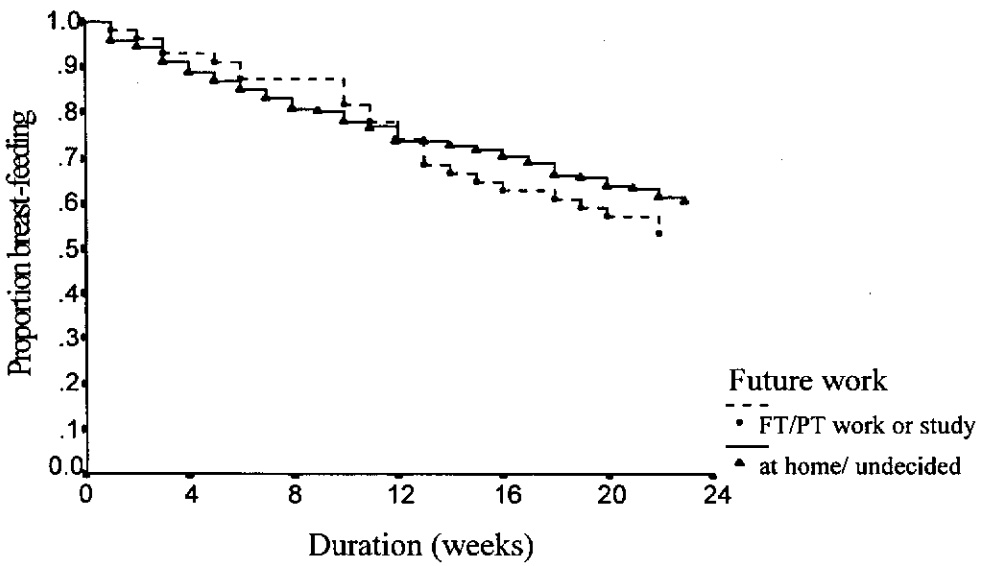


Future employment intentions

Breast-feeding duration was not significantly associated with a woman's intention to return to work within six months of delivery (Log rank X^2 = .59 df = 1 p = .442) (Figure 5.26). However, there was a trend for more women who intended to stay at home to be still breast-feeding at 24 weeks (60%) compared with women who intended to return to work or study (53%).

The finding that over half of those women who were intending to return to work or study were still breast-feeding at 24 weeks, suggests one of two things. Either they had changed their minds and not returned to work, or they had managed to successfully combine employment or study outside of the home with breast-feeding.

Figure 5.26: Association between intended employment status for within six months following delivery and breast-feeding duration



6 Results - Multivariate analysis of factors associated with the initiation and duration of breast-feeding

6.1 Factors associated with the initiation of breast-feeding

Multivariate logistic regression analysis was used to determine which variables could best explain the chosen method of feeding. In all, 16 variables identified in the literature as being associated with the initiation of breast-feeding were included in the full model and complete data were available for 437 of the 556 mothers (79%). Variables found to have a non-significant effect on the model were then removed in a backwards stepwise fashion. All variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 test statistic on the relevant degrees of freedom was significant (Table 6.1).

After controlling for covariate and confounding variables, psycho-social factors were strongly associated with the initiation of breast-feeding. In particular there was a strong association between a woman's decision to breast-feed and the father's preference for breast-feeding, as reported by the mother. Women who perceived their partners to prefer breast-feeding were more likely to initiate breast-feeding than women who perceived their partners to prefer bottle-feeding or to be ambivalent about how they fed their infant (OR=10.18 $CI_{95\%}$ 4.42 - 23.42).

Table 6.1: Factors associated[a] with breast-feeding at discharge from hospital (n=437)

Variable[b]	n	ß	SE	Wald statistic	Odds ratio (relative to first category)	CI95%
Father's attitude						
Prefers bottle-feeding or ambivalent	224					
Prefers breast-feeding	213	2.320	.425	29.78	10.18	4.42 - 23.42
Infant birth weight						
≥2500g	423					
<2500g	14	1.457	.739	3.89	0.13	0.05 - 0.99
When decided feeding method						
During or after pregnancy	127					
Before pregnancy	310	1.186	.313	14.35	3.27	1.72 - 6.04
Maternal grandmother had breast-fed at least one child						
No or don't know	127					
Yes	310	0.639	.316	4.08	1.89	1.02 - 3.50
Family income						
> $40 000	76					
$25 001 - $40 000	151	0.368	.594	2.45	1.44	0.61 - 3.41
$15 001 - $25 000	132	0.483	.476	1.03	1.62	0.63 - 1.57
< $15 000	78	0.930	.439	0.70	2.53	0.79 - 8.11
Years of education						
< 12 yrs	267					
≥ 12 yrs	170	-0.068	.326	0.04	0.93	0.57 - 1.77
Partner's occupation						
Professional / administrative	89					
Sales / clerical	35	-0.172	.675	0.06	0.84	0.22 - 3.16
Trades / labourers	272	-0.869	.465	3.49	0.42	0.17 - 1.04
Others	41	0.842	.887	0.90	2.32	0.41 - 13.2

-2 log likelihood (deviance) = 288.535

a Non-significant variables were maternal age, marital status, parity, infant sex, method of delivery, maternal occupation, maternal ethnic background, maternal grandmother's feeding preference and attendance at antenatal classes

b All variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 test statistic on the relevant degrees of freedom was significant.

Women whose own mother had breast-fed at least one infant were more likely to initiate breast-feeding than women who didn't know how their mother had fed her infants or women whose mother had bottle-fed all her infants (OR=1.89 $CI_{95\%}$ 1.02 - 3.50). Women who had made their decision on how to feed their infant before their pregnancy were over three times more likely to initiate breast-feeding than women who had chosen their method of feeding either during their pregnancy or after delivery (OR 3.27 $CI_{95\%}$ 1.72 - 6.04).

There was a weak association between the level of maternal education and breast-feeding duration. However, unexpectantly, it was women with 12 or more years of education who were less likely to initiate breast-feeding when compared with women with less than 12 years of education (OR=.93 $CI_{95\%}$ .57 - 1.77). Similarly, women from households with a high annual family income (>$40 000) were the least likely to breast-feed. Women from low income households (<$15 000) were more likely to breast-feed than woman from high income households (OR=2.53 $CI_{95\%}$ 0.79 - 8.11). Women whose partners worked in sales or clerical positions or in trades and labouring positions were less likely to breast-feed than women whose partners worked in worked in professional or administrative occupations (OR= 0.84 $CI_{95\%}$ 0.22-3.16 and OR = 0.42 $CI_{95\%}$ 0.17-1.04, respectively)

Hospital practices such as rooming-in, encouragement to demand feed and early infant-to-breast contact were not entered into the model on the assumption that they were unlikely to directly influence a woman's choice of feeding method, given that most women make this choice well before being admitted to hospital. On the other hand, it is possible that attendance at antenatal classes during pregnancy may exert an influence on the decision to breast-feed. However, attendance at antenatal classes for either this or a

previous pregnancy was not found to be associated with the initiation of breast-feeding.

Biomedical factors such as parity, infant sex and method of delivery were not found to be associated with the initiation of breast-feeding. However, women (n=14) who had delivered a low birth weight infant (<2 500g) were less likely to breast-feed than women who delivered heavier infants (OR=.23 $CI_{95\%}$ .05 - .99).

6.2 Factors associated with the duration of breast-feeding

Variables reported in the literature to be associated with the duration of breast-feeding were investigated using the Cox's proportional hazards model which allows joint estimation of the effects of independent variables on the duration of breast-feeding or, in this study, the hazard or risk of stopping breast-feeding before 24 weeks post-partum.

A number of models were tested in an attempt to find a model which best explained the effect of these variables on breast-feeding duration. Firstly, a model was tested in which only the main effects were considered. In all 22 variables were entered into the full model and complete data were available for 354 of the 466 breast-feeding mothers (76%). The association between smoking habits and breast-feeding duration was not assessed in the model as this question was only asked at two weeks post-partum and these data were missing for those women who declined to participate in the follow-up phase of the study (n= 64). The inclusion of this factor in the model would subsequently affect the reliability of the model. Those variables found to have a non-significant effect were then removed in a backwards stepwise fashion. All six variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 statistic on the relevant degrees of freedom was significant. The -2 Log Likelihood for this model was 1204.355 on 7 degrees of freedom.

A second model was tested which included 22 main effects and 15 selected two-way interactions of these main effects. This produced a model which contained a combination of some of the main effects and interactions of some of these six variables (-2 LL=1203.544 df=6). However, as the -2 Log Likelihood of the first and second models were not significantly different, only the results of the first model, which considered main effects only, will be discussed for reasons of ease of interpretation (Table 6.2).

Table 6.2: Factors associated[a] with a shorter duration of breast-feeding (n=354)

Variable[b]	n	ß	SE	Wald statistic	Odds ratio (relative to first category)	CI95%
Age	354	-.069	.0202	11.517	0.50[c]	0.34 - 0.74[c]
Intended duration						
≥ 4 months	250					
undecided	79	.473	.226	4.368	1.60	1.03 - 2.50
< 4 months	25	1.611	.287	31.459	5.01	2.85 - 8.80
Father's preference						
Prefers breast-feeding	193					
Prefers bottle-feeding or ambivalent	161	.419	.192	4.773	1.52	1.04 - 2.21
Infant sex						
Female	185					
Male	169	-.530	.195	7.356	1.69	1.16 - 2.50
Father's employment status						
Employed	333					
Unemployed	21	.680	.309	4.846	1.97	1.08 - 3.62
Years of education						
≤ 10 years	143					
> 10 years	211	-.321	.191	2.844	0.72	0.50 - 1.05

-2 log likelihood (deviance) 1204.355

[a] Non-significant variables were method of delivery, low birth weight, parity, admission to the SCN, attendance at antenatal classes, conflicting breast-feeding advice, demand feeding, early infant-to-breast contact, rooming-in, maternal grandmother's preference, whether maternal grandmother had breast-fed, previous employment status, future, employment intentions, when the feeding decision was made, mother's country of birth and marital status.

[b] All variables in the final model were variables for which when excluded the change in deviance compared with the corresponding X^2 test statistic on the relevant degrees of freedom was significant.

[c] Odds ratio and CI95% calculated for a 10 year age difference (i.e. a 30 year old woman relative to a 20 year old woman)

Socio-demographic factors found to be associated with breast-feeding duration included maternal age, level of maternal education and partner's employment. There was a positive association between maternal age and duration of breast-feeding, so that a woman aged 30 years was only about half as likely as a 20 year old woman to stop breast-feeding at any time after controlling for the other variables in the model (RR = 0.50 $CI_{95\%}$ .34-.74). Women whose partners were unemployed (RR = 1.97 $CI_{95\%}$ 1.08-3.62) were more likely to have stopped breast-feeding at any time than women whose partners were employed. There was a weak association between maternal education and breast-feeding duration. Woman who had completed more than the minimum legal requirement for schooling (>10 years) were less likely to have stopped breast-feeding at any time compared with women who had completed at most 10 years of education (RR = 0.72 $CI_{95\%}$ 0.50 - 1.05)..

Duration of breast-feeding was not associated with biomedical factors such as method of delivery, parity, infant birth weight or whether the infant had been admitted to the Special Care Nursery (SCN). An unexpected finding was that women who had delivered a son were more likely to have stopped breast-feeding at any time compared with women who had delivered a daughter (RR = 1.69 $CI_{95\%}$ 1.16 - 2.50).

Hospital practices such as rooming-in, early infant to breast contact or demand feeding were not found to be associated with the duration of breast-feeding. Similarly, whether a woman had attended antenatal classes for this, or a previous, pregnancy was not associated with breast-feeding duration. Women who had reported receiving conflicting advice regarding breast-feeding were no more likely to have stopped breast before six months than women who had not received conflicting advice.

Several psycho-social factors were associated with breast-feeding duration, with intended duration being strongly associated with breast-feeding duration.

Not surprisingly, mothers who intended to stop breast-feeding before four months postpartum were more likely to have stopped breast-feeding at any time (RR = 5.01 $CI_{95\%}$ 2.85 - 8.80) compared with women who intended to breast-feed for at least four months. Similarly, women who were undecided about how long they would breast-feed had a greater hazard for breast-feeding cessation than women who intended to breast-feed for four months or more (RR = 1.60 $CI_{95\%}$.1.03 - 2.50).

Father's attitude towards breast-feeding was also associated with breast-feeding duration. Women who perceived that their partners preferred bottle-feeding or were ambivalent about the feeding method were more likely to have stopped breast-feeding at any time compared with women who perceived their partners to have a preference for breast-feeding (RR = 1.52 $CI_{95\%}$ 1.04 - 2.21). Breast-feeding duration was associated with the maternal grandmother's attitude towards breast-feeding, whether the maternal grandmother had breast-fed at some time or when the decision to breast-feed was made.

The effect of maternal employment on breast-feeding was investigated indirectly. Women who had worked or studied during the six months prior to delivery were no more, or less, likely to have stopped breast-feeding at any time compared with women who had not worked or studied during this period. Similarly, women who intended to return to either full- or part-time work or study within six months of delivery were no more likely to have stopped breast-feeding at any time compared with women who intended to remain at home.

7 Results - Mothers' breast-feeding experiences

7.1 Breast-feeding confidence, enjoyment and satisfaction

At two weeks postpartum a series of three questions were asked to determine the level of confidence in, enjoyment of and satisfaction with breast-feeding. A five point Likert-type scale was used with a low score of one indicating 'not confident/ enjoyable /satisfied' and a high score of five indicating 'very confident/ enjoyable /satisfied'. For the purpose of analysis the values of one to three were collapsed into a single category as were the values of four and five. As might be expected, when compared with primiparous mothers, multiparous mothers were more confident about breast-feeding, found the experience more enjoyable and were more satisfied with the experience (Table 7.1).

Table 7.1: Association between parity and a woman's breast-feeding experiences at 2 weeks

	Primiparous		Multiparous		
	n	%	n	%	
Confident in breast-feeding					
Yes	92	79.3	228	89.4	$X^2 = 6.86$ df =1
Other	24	20.7	27	10.6	p = .009
Enjoyed breast-feeding					
Yes	73	62.9	215	84.3	$X^2 = 20.99$ df = 1
Other	43	37.1	40	15.7	p < .000
Satisfied with breast-feeding	92	79.3	228	89.4	$X^2 = 6.86$ df = 1
Yes	24	20.7	27	10.6	p = .009
Other					

The association between a woman's breast-feeding experiences at two weeks post-partum and breast-feeding duration was determined (Table 7.2). Women who breast-fed for four or more months were more likely to have been confident breast-feeding, and to have been satisfied with the experience at two weeks.

Table 7.2: Association between a woman's breast-feeding experiences at 2 weeks post-partum and duration of breast-feeding

	Breast-feeding < 4 months		Breast-feeding ≥ 4 months		
	n	%	n	%	
Confident in breast-feeding					
Yes	90	77.6	230	90.2	$X^2 = 10.69$ df =1
Other	26	22.4	25	9.8	p = .001
Enjoyed breast-feeding					
Yes	83	71.6	205	80.4	$X^2 = 3.58$ df = 1
Other	33	28.4	50	19.6	p < .058
Satisfied with breast-feeding					
Yes	91	78.4	229	89.8	$X^2 = 8.67$ df = 1
Other	25	21.6	26	10.2	p = .003

A total breast-feeding experience scale at two weeks was calculated by summing the responses to the three questions then dividing by the number of items for which a valid response was recorded. Scores ranged from one to five with a low score indicating a negative experience and a high score a positive breast-feeding experience. The reliability coefficient for the scale (Cronbach's alpha) was 0.76, indicating acceptable internal consistency. The group mean for the total breast-feeding score at two weeks postpartum was 4.31 (std dev = .676). The association between breast-feeding experience at two weeks post-partum and various socio-demographic factors was then tested for using analysis of variance or independent t-test (Table 7.3).

Table 7.3: Association between socio-demographic, psycho-social factors and hospital practices and breast-feeding experiences score at 2 weeks post-partum

	Mean attitude score#	
Age		
< 25 years	4.10[a]	F = 6.442
25-29 years	4.29[b]	p = .0003
30-34 years	4.50[c]	
35+ years	4.44[c]	
Mother's country of birth		
Australia/ New Zealand/ Other	4.30	F = .1038
United Kingdom	4.29	p = .901
Asia	4.39	
Years of education		
< 12 years	4.36	p = .083
≥ 12	4.23	
Parity		
Primiparous	4.04	p = .073
Multiparous	4.43	
Father's feeding preference		
Prefers breast-feeding	4.36	p = .101
Prefers bottle-feeding or ambivalent	4.24	
Maternal grandmother's feeding preference		
Prefers breast-feeding	4.31	p = .942
Prefers bottle-feeding or ambivalent	4.31	
Maternal grandmother had breast-fed		
Yes	4.31	p = .947
No/ Don't know	4.30	
Infant roomed-in		
Yes	4.44	p = .013
No	4.25	
Infant put to the breast within 30 minutes of delivery		
Yes	4.42	p = .002
No	4.20	
Infant spent time in the Special Care Nursery		
Yes	4.25	p = .519
No	4.32	
Mother attended antenatal class		
Yes, this or previous pregnancy	4.33	p = .455
No	4.28	

Where 1 = negative breast-feeding experiences and 5 = very positive breast-feeding experiences

Younger mothers (<25 years) had significantly less positive breast-feeding experiences compared with older women. There was no association between a woman's breast-feeding experiences and her level of education or ethnic background. Multiparous women had no more or less positive breast-feeding experiences than primiparous women. However, as the raw score for confidence, enjoyment and satisfaction with breast-feeding were significantly different for these groups, it suggests that the scale is somewhat insensitive to differences between groups.

Whether a woman's own mother had breast-fed or not did not appear to have an influence on her breast-feeding experiences. Similarly, women whose mother or partner were reported to have a preference for breast-feeding had no more positive breast-feeding experiences than those women whose mother or partner were reported to either prefer bottle-feeding or to be ambivalent about how the mother fed her infant.

Women who had roomed-in with their infants had significantly higher mean breast-feeding experience scores than women who had not roomed-in. Similarly, women who had been encouraged to put their infant to their breast within 30 minutes of delivery had more positive mean breast-feeding experience scores compared with women who had experienced delayed infant-to-breast contact. Women whose infants had spent some time in the Special Care Nursery (SCN) had no less positive breast-feeding experiences compared with women of infants who had not been admitted to the SCN. Women who had attended antenatal classes for this or a previous pregnancy had similar mean breast-feeding experience scores as those women who had never attended antenatal classes.

7.2 Comfort with breast-feeding in public

Mothers were also asked a series of questions related to how comfortable they felt breast-feeding in public under various circumstances. A five point Likert-type scale was used with a low score of one indicating 'not comfortable' and a high score of five indicating 'very comfortable'. In general, women's level of comfort decreased when breast-feeding in front of men or in front of strangers such as on public transport, in public eating places or in busy shopping malls (Table 7.4).

A total comfort scale was calculated by summing the responses to the ten questions then dividing by the number of items for which a valid response was recorded. Scores ranged from one to five with a low score indicating a lack of comfort and a high score a high degree of comfort with breast-feeding in public situations. The group mean for the total breast-feeding comfort scale at two weeks postpartum was 3.45 (std dev = 1.10). The reliability coefficient for the scale (Cronbach's alpha) was 0.95, indicating very good internal consistency.

There was no correlation between duration of breast-feeding and the total comfort score (r = .170). However, when mothers were grouped into short-term breast-feeders (those who had weaned by 6 weeks) and long-term breast-feeders (those who were still breast-feeding at 24 weeks) some interesting trends emerged (Table 7.4). With the exception of breast-feeding in front of relatives and friends, both male and female, the mean comfort score of long-term breast-feeders was significantly higher than the mean score of short-term breast-feeders. Thus it would seem that successful breast-feeders, that is women still breast-feeding at 24 weeks, are less concerned about or influenced by the need for privacy and modesty or, alternatively, have become used to breast-feeding in public.

Table 7.4: Mothers' level of comfort with breast-feeding in public under various conditions

	Mean comfort score [1]						
	All breast-feeders		Short-term[2] (n=75)		Long-term[3] (n=217)		
Breast-feeding situation	Mean	Std dev	Mean	Std dev	Mean	Std dev	T-test[4]
In front of other people, in general	3.67	1.20	3.24	1.33	3.80	1.13	p = .008
In front of female relatives e.g. mother, sister	4.59	0.81	4.50	0.93	4.65	0.74	p = .299
In front of female friends	4.52	0.87	4.26	1.16	4.60	0.76	p = .055
In front of male relatives e.g. father, brother	3.52	1.47	3.24	1.55	3.61	1.43	p = .110
In front of male friends	3.34	1.45	3.08	1.47	3.48	1.43	p = .081
In someone else's home	3.68	1.29	3.30	1.49	3.84	1.21	p = .021
On public transport e.g. bus or train	2.54	1.50	2.15	1.46	2.74	1.50	p = .013
In a public eating place	2.66	1.53	2.08	1.47	2.87	1.50	p = .001
In a public place e.g. park, beach	3.53	1.38	3.22	1.49	3.70	1.29	p = .021
In a busy shopping mall	2.58	1.54	2.32	1.58	2.72	1.54	p = .101
Total comfort score	**3.45**	**1.10**	**3.11**	**1.15**	**3.59**	**1.07**	**p = .006**

[1] Where 1 = not comfortable and 5 = very comfortable [2] Mothers who had terminated breast-feeding at < 6 weeks postpartum [3] Mothers who were still breast-feeding at 24 weeks
[4] Independent t-test comparing short-term and long-term breast-feeding mothers

The association between the degree of comfort at two weeks postpartum with breast-feeding in public situations and various socio-economic factors was tested for using analysis of variance or independent t-test (Table 7.5).

Table 7.5: Association between socio-demographic, psycho-social factors and overall degree of comfort with breast-feeding in public situations at 2 weeks post-partum

	Mean comfort score#	
Age		
< 25 years	3.16[a]	F = 3.3212
25-29 years	3.50[b]	p = .020
30-34 years	3.57[b]	
35+ years	3.67[b]	
Mother's country of birth		
Australia/ New Zealand	3.47	F = 2.0106
United Kingdom	3.42	p =.135
Asia	2.80	
Years of education		
< 12 years	3.42	p = .557
≥ 12	3.50	
Parity		
Primiparous	3.18	p = .002
Multiparous	3.57	
Father's feeding preference		
Prefers breast-feeding	3.51	p = .215
Prefers bottle-feeding or ambivalent	3.36	
Maternal grandmother's feeding preference		
Prefers breast-feeding	3.44	p = .937
Prefers bottle-feeding or ambivalent	3.45	
Maternal grandmother had breast-fed		
Yes	3.48	p = .455
No	3.38	

Where 1 = not comfortable and 5 = very comfortable

Young mothers (<25 years) were least comfortable with breast-feeding in public situations. Similarly, primiparous women were significantly less comfortable breast-feeding in public compared with multiparous women. Neither level of maternal education nor a woman's ethnic background was associated with the mean total comfort score.

It is possible that the results comparing the mean comfort score for short- and long-term breast-feeders (Table 7.4) are confounded by age and parity as both of these were shown to be significantly associated with mean comfort score (Table 7.5) and both were significantly associated with the duration of breast-feeding in univariate analyses.

Women whose partners were reported to have a preference for breast-feeding were no more comfortable breast-feeding in public situations compared with women whose partners either preferred bottle-feeding or were ambivalent about the feeding method. Similarly, a woman's level of comfort with breast-feeding in public was not influenced by the maternal grandmother's feeding preference nor whether the maternal grandmother had breast-fed at least one child.

7.3 Breast-feeding problems

At baseline, breast-feeding mothers were asked if they had experienced any breast-feeding problems. They were also asked the type of problems experienced.

At each follow-up interview mothers were questioned about the type of feeding problems they had experienced since the last interview. The reported problems were grouped in broad categories, namely breast-related problems, feeding problems, anxiety over milk supply and 'other' problems. At discharge 82.6% of women had experienced one or more breast-feeding

problems. As might be expected the proportion of women experiencing problems decreased over time (Table 7.6).

The most common problems experienced prior to discharge were sore or cracked nipples (55.8%) and engorged breasts (26.6%). Breast-related problems decreased over time, although almost 8% of women who were still breast-feeding at six months were experiencing some breast-related problems.

Table 7.6: Type of breast-feeding problems experienced by mothers from delivery to 24 weeks post-partum

	Interview Interval						
	Hospital	2 weeks	6 weeks	10 weeks	14 weeks	18 weeks	24 weeks
No. of women breast-feeding	466	370	327	294	264	239	217
No. of women having problems	385	106	74	50	40	26	29
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Type of problems experienced by breast-feeding mothers							
Breast-related							
Sore or cracked nipples	55.8	16.5	5.2	2.4	2.3	0.8	2.3
Feeding painful	*	2.7	0.9	1.0	0.8	0.8	0.4
Mastitis	*	2.2	5.2	3.4	1.1	1.2	4.6
Engorged breasts	26.6	2.4	1.2	0.3	-	-	-
Inverted nipples	3.0	0.5	0.6	-	-	-	0.4
Feeding problems							
Baby gets too much milk or too fast	37.6	13.5	1.5	0.3	0.8	-	-
Poor let down	7.8	-	-	0.3	-	-	-
Baby too tired to feed/ doesn't wake up	30.5	1.6	0.3	6.8	-	-	-
Baby has trouble sucking	9.6	3.8	0.3	-	-	-	0.4
Anxiety over milk supply							
Not enough milk	23.0	3.0	8.0	4.1	4.9	4.6	2.3
Baby refuses breast/unsettled	*	2.4	3.4	4.8	4.9	4.6	3.7
Baby not gaining weight	3.2	0.5	0.3	0.3	1.1	-	0.4
Other	-	3.2	1.8	2.0	2.6	0.8	1.4
(Feeling of not doing well)	(15.2)						

Mothers may have indicated that they were experiencing multiple problems * This response was not provided in the baseline questionnaire as a prompted response

At discharge a number of mothers were experiencing problems related to the feeding technique such as poor let-down (7.8%) and the baby receiving too much milk or milk too quickly (37.6%). Almost one third (30.5%) of mothers were concerned that their infant was too tired to feed or didn't wake up for feeds and almost 10% indicated that their infant had trouble sucking. However, as might be expected the percentage of women experiencing these problems declined over time and were relatively uncommon amongst women still breast-feeding at six months. At discharge a number of women expressed concern over their milk supply with 23% being anxious over their actual milk supply and 3.2% being concerned that infants were not gaining enough weight. This continued be a concern for approximately 10% of breast-feeding women throughout the study period.

Many breast-feeding problems are easily manageable and do not necessarily lead to weaning. A decline in breast-feeding problems may be related to resolution of problems as a result of women becoming more confident and experienced in breast-feeding. Alternatively it could be argued that the apparent decline is the result of unsuccessful breast-feeding mothers giving up breast-feeding as a result of unresolved problems. The subsequent impact of breast-feeding on the method of feeding at the next interview interval is presented in Table 7.7. It is apparent that while breast-related problems were relatively common in the first six weeks of breast-feeding they alone were not likely to result in the early cessation of breast-feeding. On the other hand, almost one quarter of women who expressed anxiety over the milk supply at two weeks post-partum had ceased breast-feeding by six weeks.

Table 7.7: Impact of breast-feeding problems on subsequent breast-feeding success

	No.# at 2 weeks	Impact* at 6 weeks	No.# at 6 weeks	Impact* at 10 weeks	No.# at 10 weeks	Impact* at 14 weeks	No.# at 14 weeks	Impact* at 18 weeks	No.# at 18 weeks	Impact* at 24 weeks
Breast-related problems	61	4.9	26	3.8	17	0.0	7	14.3	6	16.7
Anxiety over milk supply	17	23.5	36	16.6	24	12.5	24	16.6	18	3.3
Feeding problems	21	9.3	6	16.7	3	0.0	2	0.0	-	-
Other problems	7	57.1	16.7	16.7	6	16.7	7	14.3	2	100.0
Total number of women breast-feeding	370		327		294		264		239	

Number of women experiencing the problem at each interview interval

* Percentage of women experiencing the problem who had terminated breast-feeding by the next interview interval

7.4 Reasons for terminating breast-feeding

Of the 466 women who were breast-feeding at discharge, 155 of these women who remained in the study had stopped breast-feeding before six months. The reasons for ceasing breast-feeding are many and varied and are presented as broad categories in table 7.8. The most common reason given for stopping breast-feeding within two weeks post-partum was that the infant was unsettled (37.5%).

Mothers often self-diagnose breast milk insufficiency on the basis of their child's behaviour. They frequently interpret unsettledness as a symptom of hunger resulting from insufficient milk supply. Unsettled infant behaviour and a concern that their breast milk was inadequate were the major reasons for women stopping breast-feeding before six months at all interview intervals. Maternal fatigue or ill health also contributed to the early termination of breast-feeding.

There was a perception that the infants weaned themselves and this was cited by an increasing number of women who weaned after 10 weeks. Indicators that an infant was ready to wean included the infant losing interest in, or refusing, the breast and/or preferring a bottle. A lack of maternal motivation indicated by statements such as *'breast-feeding is too difficult'*, *'breast-feeding is inconvenient'* and *'dislike breast-feeding'* was given as a reason for stopping breast-feeding by almost a quarter of women who stopped breast-feeding between 7 and 14 weeks.

Most women stopped breast-feeding of their own initiative (85.8%) with relatively few indicating that they had been advised to stop by their local doctor (4.5%) or child health sister (3.2%). Family members appeared to exert a greater influence on the decision to stop breast-feeding than health care professionals, with 5.2% indicating that their mother and 2.6% indicating that a friend, had advised them to stop breast-feeding.

Table 7.8: Reasons for terminating breast-feeding before 24 weeks

	< 2 weeks		3-6 weeks		7-10 weeks		11-14 weeks		15-18 weeks		19-24 weeks	
No. of women terminating breast-feeding during this time interval #	24		35		27		25		23		21	
Reason for terminating breast-feeding	n	%*	n	%	n	%	n	%	n	%	n	%
Breast or feeding related problems	3	12.5	2	5.7	2	7.4	-	-	-	-	-	-
Perceived breast milk insufficiency	1	4.2	6	17.1	5	18.5	2	8.0	5	21.7	4	19.0
Baby unsettled	9	37.5	10	28.6	5	18.5	6	24.0	5	21.7	3	14.3
Baby not gaining enough weight	1	4.2	2	5.7	1	3.7	-	-	1	4.3	2	9.5
Time to wean - mother's decision	-	-	-	-	-	-	-	-	-	-	-	-
Time to wean - infant's decision	1	4.2	2	5.7	-	-	4	16.0	3	13.0	9	42.9
Maternal tiredness or health problems	5	20.8	4	11.4	2	7.4	1	4.0	1	4.3	5	23.8
Lack of maternal motivation	4	16.7	4	11.4	7	25.9	5	20.0	3	13.0	2	9.5
Infant health problems	1	4.2	5	14.2	2	7.4	-	-	-	-	1	4.8
Return to work study	-	-	1	2.8	1	3.7	3	12.0	3	13.0	4	19.0
Father can help or prefers bottle-feeding	-	-	-	-	1	3.7	-	-	-	-	-	-

Does not include women who were lost to the study in the intervening period

*Percentages do not add up to 100 as mothers may have indicated more than one reason for terminating breast-feeding

8 Discussion

8.1 Recent trends in breast-feeding rates in Perth

Breast-feeding initiation and duration rates peaked in the mid-1980s in Australia and other Western countries. Since this time it appears breast-feeding rates have declined amongst some groups in both the USA (Ryan et al. 1991) and the UK (Emery et al. 1990). Analysis of breast-feeding data from the 1989-90 National Health Survey suggests a similar decline in both initiation and duration rates for Australia (Glover and Woollacott 1992). However, shortcomings in the questions used to collect the data and the way in which the results were analysed have been identified, raising some doubts as to the reliability of these results (Lund-Adams and Heywood 1994). Results from this study suggest that in Perth, at least, breast-feeding rates have remained relatively stable over the last decade or so.

In total, 88.1% of women initiated breast-feeding in hospital. At discharge 83.8% of women were breast-feeding, with 61.8% at 3 months and 50% at six months. These results compare favourably with the national rates reported by Palmer (1985) for 1983, and suggest a slight increase in breast-feeding duration. However, these rates while stable, still fall short of the National Goals and Targets for breast-feeding (Nutbeam et al. 1993), especially with regard to duration (Table 8.1).

It is possible, that the results of this study under-estimate the breast-feeding initiation and duration rates for Perth women, in general. Due to limitations in the study design it was unlikely that women who chose to participate in early discharge programs would be included in the study sample. Women who participate in early discharge programs are usually multiparous and/or more confident in their ability to manage with their infant at home (including confidence in breast-feeding). Furthermore, research suggests that

participation in early discharge programs is positively associated with longer breast-feeding duration (Waldenstrom et al. 1987; Emery et al. 1990). Similarly, the deliberate over-sampling of women from lower SES groups, who have been shown to have lower breast-feeding rates (Rutishauser and Carlin 1992; Ford et al. 1994) may have contributed to a further under-estimation of breast-feeding among Perth women, in general.

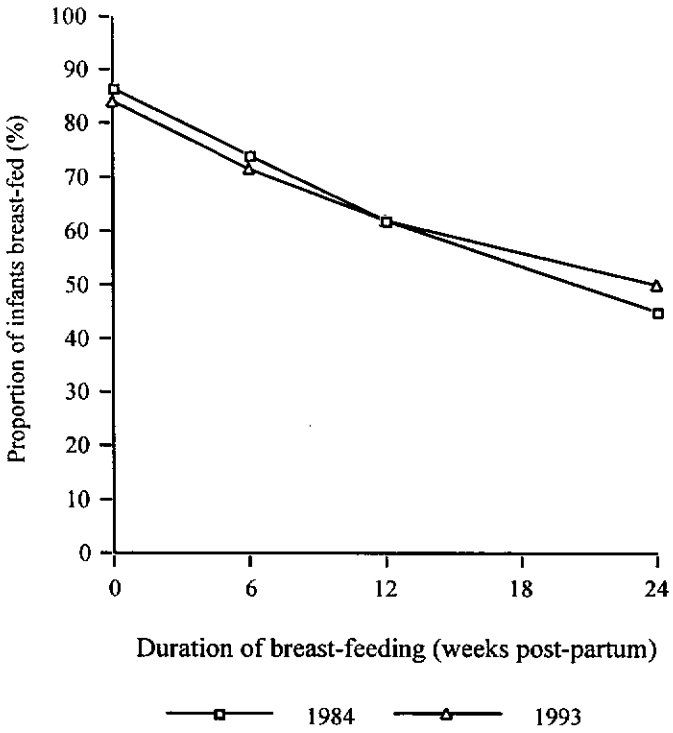
Table 8.1: Comparison of breast-feeding rates[a] in Perth 1993 and Australia 1983.with current recommendations

	1993 (%)	1983[b] (%)	National Goals and Targets[c] (%)
Discharge	84	85	90
3 months	61	55	80
6 months	49	42	80

[a] Includes full and partial breast-feeding
[b] (Palmer 1985)
[c] (Nutbeam et al. 1993)

The initiation and duration rates reported in this study for Perth are almost identical to those reported by Hitchcock and Coy for an infant growth study conducted in 1984 (Figure 8.1) (Hitchcock and Coy 1988). In the 1984 study, data and measurements were recorded for 911 infants prospectively over 12 months by child-health nurses.

Figure 8.1: Breast-feeding rates in Perth - 1984 and 1993



Breast-feeding rates are not consistent across all socio-economic groups and lower than average breast-feeding initiation and duration rates have been reported for women of lower SES (Hitchcock and Coy 1988; Msuya et al. 1990; Ryan et al. 1991; Hunkeler et al. 1994). To allow direct comparison with the 1984 study, families were ranked by the Congalton Scale using father's occupation as a measure of social status, where the highest rank (group A) is assigned to professional and academic occupations and the lowest rank (group D) is assigned to unskilled occupations (Congalton 1969). In this study, due to the relatively small numbers in rank A, ranks A and B were combined; unemployed partners were assigned to rank D. In the absence of unit data for the 1984 study, the number of families in each social rank post discharge was estimated assuming uniform attrition across all social ranks. The social rank of families, at discharge, were similar in both studies (X^2 3.00, df 3, p=.391).

Table 8.2: Prevalence of breast-feeding[a] in Perth in relation to social rank[b] in 1984[c] and 1993

	Proportion of infants breast-fed in each rank							
	A+B		C		D		Total	
Age	n[d]	% (± CI95%)	n[d]	% (± CI95%)	n[d]	% (± CI95%)	n[e]	% (± CI95%)
Hospital discharge								
1984	179	94.4 (91.0 - 97.8)	409	87.8 (84.6 - 91.0)	267	80.9 (76.2 -85.6)	906	86.4 (84.2 - 88.6)
1993	62	90.3 (82.9 - 97.7)	285	84.2 (79.9 - 88.5)	157	81.5 (75.4 - 87.6)	556	83.8 (80.7 - 86.9)
Six weeks								
1984	177	88.8 (84.2 - 93.4)	405	75.0 (70.8 - 79.2)	264	64.9 (59.1 - 70.7)	899	73.6 (70.7 - 76.5)
1993	53	88.4 (80.4 - 96.6)	254	74.3 (69.0 - 79.6)	136	61.4 (53.4 - 69.4)	476[f]	71.5 (67.6 - 75.4)
12 weeks								
1984	174	79.9 (73.9 - 85.9)	397	63.9 (59.2 - 68.6)	259	50.0 (43.9 -56.1)	878	61.8 (58.6- 65.0)
1993	53	82.6 (72.8 - 92.4)	244	65.0 (59.1 - 70.9)	139	51.4 (43.0 - 59.8)	470	61.8 (57.5 - 66.1)
24 weeks								
1984	167	63.1 (55.8 - 70.4)	380	45.8 (40.8 - 50.8)	248	35.1 (29.2 - 41.0)	839	45.0 (41.6 - 48.4)
1993	52	74.8 (63.2 - 86.4)	241	52.4 (46.1 - 58.7)	131	39.1 (30.7 - 47.5)	462	50.0 (45.5 - 54.5)

a Breast-feeding includes those who received complementary feeding
b Based on Congalton: A, the highest rank; D, the lowest rank.
c Hitchcock and Coy Med J Aust 1988; 148: 114-117
d In the absence of unit data for the 1984 study, the number of families in each social rank was estimated assuming uniform attrition across social ranks
e The sum of the number of infants in each social rank does not equal the total sample size as not all mothers stated the occupation of the infant's father
f In the 1993 study 64 women chose to complete the baseline questionnaire but declined to participate in the follow-up phase of the study.

Source: Scott JA, Binns CW, Aroni RA. Breast-feeding in Western Australia - recent trends. Australian and New Zealand Journal of Public Health 1996; 20: 210-211.3

Again, the results were similar to those reported for 1984 (Table 8.2), with more mothers from the higher social ranks initiating breast-feeding and continuing to breast-feed for longer periods, compared with mothers from lower social ranks. The Mantel-Haenzel procedure was used to compare breast-feeding rates in 1984 and 1993, while controlling for differences in social status. There was a slight, although not statistically significant, trend for a greater proportion of women in this study to be breast-feeding at six months (Table 8.3). This was observed across all social ranks.

Table 8.3: Mantel-Haenzel estimate of odds ratio of breast-feeding, 1993 relative to 1984 controlling for socio-economic status

	At discharge	6 weeks	12 weeks	24 weeks
Odds ratio$_{MH}$	0.97	0.97	1.02	1.10
X^2_{MH}	1.20	0.63	0.12	1.57
p	0.27	0.43	0.73	0.21

Limited data on breast-feeding rates in Western Australia exist for the intervening years between 1984 and 1993. A series of questions related to infant feeding were included as part of the 1989-90 National Health Survey. In this survey women with at least one child under the age of five years were asked if they had ever breast-fed one or more of these children for some period of time. In all, 84.4% of Western Australian women indicated that they had breast-fed at least one child, with slightly more rural women (89.5%) reporting have breast-fed compared with Perth women (82.5%) (ABS 1991). However, these figures should be interpreted with care as they represent the number of women who had ever breast-fed at least one child aged five years or under and not necessarily the number of infants aged five years or under who had been breast-fed. Furthermore, as the definition of breast-feeding was not clear the percentages of children who had been fully breast-fed or partially breast-fed could not be calculated. Lund-Adams and Heywood (1994) drew attention to another weakness in the data. Women who had more than one

child aged five years or under had their breast-feeding histories counted more than once. They contend that if this group of women had a particular breast-feeding pattern that the calculated proportions could be distorted.

Fetherston (1995) studied a group of 87 women giving birth in a private maternity hospital in Perth in March 1994. She reported that 93% of women chose to initiate breast-feeding and 85% of mothers were breast-feeding on discharge. Of the 39 mothers (57% of breast-feeders) who consented to be part of the follow-up study 84% (n=33) were still breast-feeding at six weeks and 77% (n=30) were still breast-feeding at three months. The apparently longer breast-feeding duration can be explained by the fact that the participants were recruited from a private hospital and were therefore more likely to be of a higher SES with documented higher breast-feeding rates (Hitchcock and Coy 1988). Secondly, relatively few women (33/87 38%) agreed to participate in the follow-up survey potentially resulting in a self-selection bias.

Another recent Western Australia study conducted in 1993 to investigate the association of infant feeding and SIDS reported 96% of primiparous and 92% of multiparous initiating breast-feeding (Callaghan 1994). At three months, 65% of primiparous and 62% of multiparous women were still breast-feeding. Again differences in survey methodology can help to explain the apparently higher initiation and duration rates between this study and the study by Callaghan (1994).

Callaghan retrospectively randomly sampled all mothers giving birth in WA using a self-administered mail-out questionnaire. Numerous researchers have suggested that women with fewer years of education and from minority groups are under-represented in studies utilising this methodology, and the results of these studies may not accurately reflect the breast-feeding incidence amongst members of socio-economically disadvantaged groups (Martinez and Nalezienski 1979; Goodine and Fried 1984; Rassin et al. 1984; O'Campo et

al. 1992). Grossman et al. (1989) suggest that underprivileged women may be less likely to respond to a mail-out questionnaire and may be less likely to be located by mail or phone for inclusion in the survey in the first place. The exclusion of less educated and minority group women who are known to have lower breast-feeding rates can lead to an over-estimation of actual population-based breast-feeding rates.

8.2 Factors asociated with the initiation and duration of breast-feeding

Many factors which influence breast-feeding success are non-modifiable (e.g. age, education, race, parity), and as such are not subject to direct clinical intervention or structural change. However, they can be used to predict which mothers may be less likely to initiate breast-feeding and to breast-feed for the recommended duration, thus identifying sub-groups who would benefit from education efforts.

Multivariate analysis techniques were used to identify factors associated with breast-feeding initiation and duration, after controlling for potentially confounding factors. A possible selection bias may have been introduced as a result of the multivariate analysis procedures. For instance, only cases with complete data sets can be entered into a multivariate model. As a result only 354 cases of a possible 466 breast-feeding mothers (76%) were analysed using the Cox regression model. Similarly, only 437 of the total sample of 556 mothers (79%) were analysed using the multivariate logistic regression model. It was not possible to check whether these cases were missing at random or whether the missing data was in some way connected to an explanatory factor or the independent variable. For example, a woman whose partner was unemployed may not have wished to reveal this information. Similarly, a relatively large number of women chose not to reveal details about their family income. However, the models tested did produce results consistent with the findings of other researchers.

8.2.1 Demographic factors

Age has consistently been associated with both breast-feeding initiation and duration in studies in Australia (Rutishauser and Carlin 1992; Lowe 1994) and other Western countries (Starling et al. 1979; Tamminen et al. 1983; Buxton et al. 1991; Quarles et al. 1995). In general, older mothers (> 25 years) are more likely to choose to breast-feed and to breast-feed for longer periods, than younger mothers (Samuels et al. 1985; Feinstein et al. 1986; Ryan et al. 1991).

In this study, after controlling for co-variates and potentially confounding variables, maternal age was not found to be associated with the initiation of breast-feeding but increased maternal age was positively associated with increased breast-feeding duration. These findings are similar to those of a recent Danish study (Michaelsen et al. 1994) which showed using multivariate analysis that, while mother's age was not statistically associated with the initiation of breast-feeding, mothers aged less than 25 years of age were significantly less likely to be breast-feeding at 6 months compared with older mothers.

In this current study, a woman aged 30 years was only about half as likely as a woman aged 20 years to stop breast-feeding at any time up to 24 weeks, after controlling for the other variables in the model (RR = .50 $CI_{95\%}$ .34-.74). A similar result was reported in another Australian study by Rutishauser and Carlins (1992) who reported that after controlling for other variables women aged 30 years were significantly less likely to have stopped breast-feeding at any time compared with women aged 20 years (RR=.45 $CI_{95\%}$ .32 - .65).

It has been suggested that the rapid resurgence in breast-feeding rates observed in the late-1970s and early-1980s can be explained in part by a rise in maternal age at first birth. However, Starbird (1991) compared the determinants of breast-feeding initiation of firstborn children in two periods,

1960-69 and 1970-79, and found that increased maternal age at first birth accounted for less than one percentage point of the increase in breast-feeding initiation which occurred over the period studied.

Most recent studies of Western women have reported a strong positive association between level of maternal education and breast-feeding initiation and duration. In general, the higher the education level attained by the mother the more likely she is to choose to breast-feed and the longer the duration of breast-feeding (Yeung et al. 1981; Martinez and Krieger 1985; Feinstein et al. 1986; Grossman et al. 1990; Lowe 1993; Lawson and Tulloch 1995). Eckhardt (1984) reported that, of all the demographic factors studied, educational level appeared to have the greatest single effect on the breast-feeding decision.

Unexpectantly, in this study level of maternal education was found to be negatively associated with breast-feeding initiation. Women with 12 or more years of education were less likely to initiate breast-feeding than women with less than 12 years of education (OR=.93 $CI_{95\%}$ .57 - 1.77). The effect of maternal education on breast-feeding duration was in the expected direction, with increased level of maternal education being positively associated with duration. Women who had completed more than the legal minimum years of education (≥11 years) were less likely to have stopped breast-feeding at any time compared with women who had completed 10 or less years of education. Unlike other studies there was no clear distinction between women with tertiary education and women without a tertiary education.

In Denmark, where initiation of breast-feeding is virtually universal (99.5%), there remains a strong positive association between the length of the mother's education and duration of breast-feeding. Michaelsen et al. (1994) used the Cox regression model to control for covariates and found that level of maternal education was positively associated with breast-feeding duration. They reported that while 79% of mothers with a higher school education (≥12

years) were breast-feeding at 6 months postpartum, only 29% of mothers with a low school education (≤ 9 years) did so.

Several studies investigating long-term trends in breast-feeding have shown that it was the better educated women who first abandoned breast-feeding in the 1950s and who also led the resurgence in breast-feeding in the 1970s (Eckhardt and Hendershot 1984; Becerra and Smith 1990; Siskind et al. 1993). In a study of Canadian women, McNally (1985) found that the higher the level of education, the more likely the mother was to initiate and continue breast-feeding. However, this gap narrowed from 1977 to 1982, as the percentage increase in breast-feeding among the less educated women (+58% from 1977 to 1982) far outpaced the increases in the more educated groups (18-22%). A similar finding was reported by Martinez and Nalezienski (1979) in an earlier study of American mothers during the period 1971 to 1978.

These results suggests that while the better educated women may have led the revival in breast-feeding in the mid-1970s, by the early 1980s their example had been followed by the less educated groups. Unfortunately, this trend appears to have plateaued or even reversed as the recent declines in breast-feeding identified in the USA and England were more pronounced among women whose education had not extended beyond high school (Emery et al. 1990; Ryan et al. 1991).

Marital status has frequently been identified as being an important discriminator for the initiation of breast-feeding (Rassin et al. 1984; Samuels et al. 1985; Grossman et al. 1990; Buxton et al. 1991; Mathews et al. 1995). In all of these studies married women were significantly more likely to have initiated breast-feeding than single women.

In this current study, after controlling for potentially confounding covariates such as age and years of education, marital status was not found to be

associated with either the initiation or duration of breast-feeding. Married women were no more or less likely to initiate breast-feeding, or to breast-feed for longer, compared with women who were single or living in de facto relationships. However, this finding is inconsistent with other recent studies which have utilised multivariate analytical techniques.

MacGowan et al. (1991) using a multivariate model demonstrated that marital status and education were the only two demographic factors investigated which influenced the initiation of breast-feeding among a sample of low-income women in the USA. Samuels et al. (1985) using discriminant analysis in another US study also demonstrated that being single was negatively associated with both the initiation and duration of breast-feeding.

Nolan and Goel (1995) in a study of Canadian women used a multivariate model and reported that marital status was associated with the initiation of breast-feeding. After controlling for potentially confounding factors such as maternal age, level of education, ethnic background and employment status, they demonstrated that single women were only half as likely to initiate breast-feeding as married women (OR 0.57 $CI_{95\%}$ 0.40- 0.81). However, marital status was not found to be associated with the likelihood of a woman breast-feeding for at least four months.

While marital status was not found, in this study, to be associated with breast-feeding behaviour, the occupation of a woman's partner was associated with the initiation of breast-feeding. Women whose partners worked in professional and administrative occupations were more likely to breast-feed than women whose partner's worked in sales or clerical positions (OR 1.19 $CI_{95\%}$ .29- 4.54) or in trades or labouring positions (OR 2.38 $CI_{95\%}$ .08 - 2.44). While there was no association between partner's occupation and breast-feeding duration, women whose partners were unemployed were almost twice as likely to have stopped breast-feeding at any time compared with women whose partners were employed (OR 1.97 $CI_{95\%}$ 1.08 - 3.62). .

The limited sampling frame made it difficult to detect differences in initiation and duration of breast-feeding amongst different SES groups. This does not necessarily imply that there was no association between SES and breast-feeding behaviours but may be a results of the restricted sample. In Australia, which lacks a clearly defined classification of social class, occupational prestige scales are often used as a proxy for socio-economic status (Congalton 1969). The social rank of the father, as determined by his occupational prestige, is used to describe the rank of the child or the family. Therefore, the influence of paternal occupation and employment status on breast-feeding rates seen in this study can be extrapolated to reflect the likely association between social class and breast-feeding rates. A consistent positive association between social class and breast-feeding rates has been demonstrated in Australia (Eaton-Evans et al. 1985; Hitchcock and Coy 1988; Rutishauser and Carlin 1992).

In this study, ethnic background was not associated with either breast-feeding initiation or duration, after controlling for potentially confounding demographic variables such as age, education and partner's occupation. However, it should be noted that the study population was relatively homogeneous with the majority of women being of Anglo-Australian background (Australian 71%; British 11.9%; New Zealand 4%). This lack of association between ethnic background and breast-feeding rates is inconsistent with the data from US studies which report consistently lower rates of breast-feeding amongst Afro-American (Ford and Labbok 1990; Buxton et al. 1991), hispanic (Rassin et al. 1984) and Southeast Asian mothers (Tuttle and Dewey 1994). However, a lack of ethnic variation in breast-feeding rates is consistent with the findings of other studies of Perth women of differing ethnic backgrounds which found that the breast-feeding practices of Vietnamese (Reynolds et al. 1988) and Aboriginal mothers (Phillips and Dibley 1983) reflected the local practices of Anglo-Australian mothers.

8.2.2 Biomedical factors

The reported association between parity and breast-feeding initiation and duration is inconsistent. Several studies have found no difference between multiparous and primiparous women (Sjolin et al. 1977; Starling et al. 1979; Loughlin et al. 1985; Bee et al. 1991), while others have found that primiparous women are more likely to initiate breast-feeding (Martinez et al. 1981; Forman et al. 1985; McNally et al. 1985; Ford and Labbok 1990). However, multiparous breast-feeders appear to continue for longer (Martinez et al. 1981; McNally et al. 1985) and a major USA national survey reported that breast-feeding duration increased with parity by one-half month per child (Ford and Labbok 1990).

In this study, when the data were analysed using univariate analysis there was a trend for primiparous mothers to be more likely to initiate breast-feeding, although this was not statistically significant (unadjusted OR 1.56 $CI_{95\%}$ .93 - 2.63). There was a significant association between parity and breast-feeding duration (Log rank X^2 8.13 df 1 p = .0044) with primiparous women having a greater hazard for the cessation of breast-feeding. However, when multivariate analytical techniques were applied to the data no association was found between parity and either breast-feeding initiation or duration. It is important to emphasise that the multivariate model selected in this study does not suggest that parity is not related to breast-feeding rates, but rather that, once the other variables were included in the model, the extra contribution of parity was marginal.

Studies have shown that the infant feeding decision with the first child or previous children is strongly associated with the feeding decision for subsequent children (Martinez and Nalezienski 1979; Da Vanzo et al. 1990). Vestermark et al. (1991) reported that women tended to breast-feed subsequent children for as long or longer than earlier children, Similarly, Victora et al. (1992) demonstrated a strong association between breast-

feeding duration in two consecutive pregnancies. In their study of Brazilian women, the duration of breast-feeding of the second child increased directly according to the duration the previous child had been breast-fed. In particular, when the previous child had been breast-fed for six months or more, the subsequent child was clearly more likely to be breast-fed. Jones et al. (1986) demonstrated no association between duration and birth order, although second and third babies were breast-fed longer than first babies. However, after 4-weeks babies of fourth and later births were breast-fed for a shorter time than even first births. A possible explanation was that mothers with several children found it difficult to devote the necessary high proportion of their time to the 'new baby' for long.

It is very rare for a woman who did not breast-feed her first child to try with the second. Similarly, lack of success in a previous attempt to breast-feed may negatively influence a woman's decision to breast-feed subsequent children. However, Da Vanzo et al. (1990) reported that higher education significantly increased the probability of a woman without breast-feeding experience breast-feeding a higher-order child. Victora et al. (1992) recommended that women who were previously unsuccessful in establishing breast-feeding, or who had previously breast-fed for less than six months, should be the number one target for promotion campaigns, particularly where resources are limited.

A surprising finding in this study was the association between infant sex and breast-feeding duration. After controlling for potential co-variates mothers who had delivered a son had a greater hazard for cessation of breast-feeding compared with mothers who had delivered a daughter (RR=1.69 $CI_{95\%}$ 1.16 - 2.50). Few other studies of Western women have reported an association between breast-feeding rates and infant sex (Pande et al. 1997). Goodine and Fried (1984), Bevan (1984), Jones et al. (1986), Vestermark et al. (1991) and Ford et al. (1994) all considered infant sex as an independent factor but failed to find an association between infant sex and breast-feeding rates. However,

Michaelsen et al. (1994) in a Danish study reported that female infants were more likely to receive formula supplements prior to discharge (OR = 1.40 $CI_{95\%}$ 0.98-2.01). Similarly, Ferris (1987) in an earlier US study reported that male infants were more likely to be breast-fed for longer than females.

Most studies reporting a association between infant sex and breast-feeding rates have been conducted in developing countries where greater cultural importance may be placed on the sex of a child. Nevertheless, the results are inconsistent. Rao and Kanade (1992) in an Indian study reported that male infants were significantly more likely to be breast-fed and to be breast-fed for longer than females. Conversly, Perez-Escamilla et al (1995) in a study of Latin American women reported that in Brazil and Honduras, having a male infant was inversely associated with exclusive breast-feeding success even after controlling for birth weight. They offered the possibility that mothers and/or health workers perceive that male infants have higher nutritional needs and should therefore receive non-breast milk fluids and foods earlier than female infants. However, Grummer-Strawn (1996) in a review of breast-feeding trends in 15 developing countries found no association between infant sex and breast-feeding duration.

There was a positive association between infant birth weight and the initiation of breast-feeding. Low birth weight (LBW) infants were significantly less likely to be breast-fed compared with heavier infants (OR=.23 $CI_{95\%}$ .05 - .99). Once breast-feeding was initiated there was no significant difference between LBW and heavier infants in the duration of breast-feeding. However, it should be pointed out that relatively few women delivering LBW infants were included in the study (n=25). High risk pregnancies and very LBW infants are usually transferred to King Edward Memorial Hospital for Women and are generally not cared for in the smaller metropolitan hospitals studied. Thus these mothers and infants were not part of the study population.

Other studies have reported an inconsistent association between infant birth weight and breast-feeding initiation and duration. Ford and Labbok (1990) in a US study found no association between LBW and the likelihood of being breast-fed. However, Ford et al. (1994) in a NZ study found that the odds of a LBW infant not being breast-fed was about twice that of a heavier infant (OR=1.94 $CI_{95\%}$ 1.06 - 3.54). While Ford et al. found no association between LBW and breast-feeding duration, Piper and Parks (1996) in a US study reported that a higher infant birth weight was a positive predictor of breast-feeding duration.

Low birth weight can be a proxy for poor infant health and LBW infants are routinely admitted to the Special Care Nursery (SCN) for monitoring and care. However, in this study there was no association between either breast-feeding initiation or duration and admission to the SCN. Women whose infants had been admitted to the SCN were no more likely to stop breast-feeding at any time before six months compared with women whose infants had not required admission to the SCN. However, this result is inconsistent with the findings reported by a number of researchers (Elander and Lindberg 1984; Ellis and Hewat 1984; Persson 1985). Fahy and Holschier (1988) found that infant transfer to the special care nursery was a strong predictor of early termination. In this earlier Australian study, only 15% of mothers who were successfully breast-feeding at six weeks had had their babies sent to the nursery compared with 63% of those who had failed at six weeks.

Infant health problems can have an impact on the initiation and establishment of breast-feeding in a number of ways. Firstly, health problems diagnosed at birth may prevent the early initiation of breast-feeding, often delaying it for 24 hours or more. Secondly, management of health problems may necessitate the separation of the infant from the mother, often for prolonged periods in the case of major health problems.

An exception to this consistent negative association between admission to the SCN and breast-feeding duration is a recent Swiss study (Hunkeler et al. 1994). While initiation of breast-feeding was slightly lower (75%) for infants admitted to the neonatal unit than for the general Swiss population (88%), this difference had disappeared by the second month and the duration of breast-feeding in neonatally ill babies paralleled that in the general Swiss population up to the fourth month. The authors attributed this mainly to encouragement of the nurses in the neonatal unit and of the midwives on the obstetric wards. This finding suggests that admission to the SCN, while presenting problems does not necessarily make the early cessation of breast-feeding a foregone conclusion.

Several researchers have investigated the effect of method of delivery on the initiation of breast-feeding. The assumption being that immediate postpartum breast-feeding and prolonged early contact between the mother delivered by Caesarean section and her baby is more difficult and possibly less likely than if she had been delivered vaginally (Procianoy et al. 1984; Grossman et al. 1989; Mansbach et al. 1991).

In general, women delivering by Caesarean section have been reported as being less likely to initiate breast-feeding than women delivering vaginally (Tamminen et al. 1983; Procianoy et al. 1984; Samuels et al. 1985; Mansbach et al. 1991). The influence of Caesarean section on breast-feeding duration is less consistent. Procianoy et al (1984) and Samuels et al. (1985) reported a negative influence on duration while others have found no association between method of delivery and breast-feeding duration (Tamminen et al. 1983; Janke 1988; Mansbach et al. 1991).

In this study, no negative association was found between Caesarean delivery and either the initiation or duration of breast-feeding. This finding might suggest one, or a combination, of two things. Firstly, that the Perth mothers in this study had a strong commitment to breast-feed regardless of intervening

events that contrived to make breast-feeding difficult. Alternatively, it might have been that women who delivered by Caesarean but wished to breast-feed were targeted for special attention by supportive obstetric nurses and mid-wives aware of the problems that can arise following a Caesarean delivery. This theory is supported by Kearney et al. (1990) who, after reviewing 10 studies, concluded that there was little evidence to support the belief that delayed first feeding, resulting from Caesarean delivery or other factors, is an independent cause of breast-feeding failure. They showed that breast-feeding support in the hospital environment and maternal commitment could over-ride the negative impact of delivery methods and delayed first breast-feeding.

Several studies have associated smoking with decreased onset and duration of breast-feeding (Yeung et al. 1981; Loughlin et al. 1985; Mansbach et al. 1991; Blomquist et al. 1994; Ever-Hadani et al. 1994; Ford et al. 1994; Horta et al. 1997). In this study smoking was negatively associated with breast-feeding when the data were analysed using univariate techniques (Log rank $X^2 = 28.79$ df = 1 p = .000). However, it was not possible to analyse the data using multivariate techniques as this question was only asked at two weeks post-partum and these data were missing for those women who declined to participate in the follow-up period of the study (n=64). Inclusion of this variable in the multivariate model would therefore have affected the reliability of the model.

8.2.3 Hospital practices

> *Hospitals exert tremendous influence over this crucial maternal-child health arena with the power to promote and model optimal breast-feeding, or to subtly undermine and sabotage the breast-feeding decision* (Powers et al. 1994 p.517).

A variety of hospital practices have been shown or proposed to deter women from initiating or successfully establishing breast-feeding. These include the delayed initiation of breast-feeding after birth (Whichelow and King 1979;

Wright and Walker 1983; Ferris et al. 1987; Buxton et al. 1991), the practice of separating the mother from the infant at night time (Starling et al. 1979; Lindenberg et al. 1990; Buxton et al. 1991), scheduled feedings (De Carvalho et al. 1983; Yamauchi and Yamanouchi 1990) and routine supplementation (Starling et al. 1979; Loughlin et al. 1985; Feinstein et al. 1986; Kurinij and Shiono 1991).

In this study only one quarter of all women (28.4%) had 'roomed-in' (i.e. had their infants with them for 24 hours of the day), and a further 34.4% had their infants with them for all of the day and part of the night. Although, it should be noted that all women had had the opportunity to have their infant room-in with them. However, as the majority were in shared rooms (88.5%) they chose not to room-in out of consideration for the other mothers in their room. The majority of all mothers (71.8%) were encouraged by hospital staff to demand feed their infants and almost half (51.8%) of the breast-feeding women in this study had put their infant to the breast within 30 minutes of delivery.

These findings are similar to those of another recent Australian study of Newcastle women (Redman et al. 1995) which reported that 39% of women initiated breast-feeding within a half hour of birth; 58% of women roomed in with their babies most or all of the time and 92% breast-fed their baby on demand. Despite the professional attention that breast-feeding has received in recent decades it would appear that there is still room for improvement as a number of women in Australia are still not provided with care consistent with the WHO/UNICEF recommendations regarding maternity services (Redman et al. 1995).

Other researchers have identified an association between breast-feeding initiation and hospital practices such as rooming-in, encouragement to demand feed and early infant-to-breast contact. However, in this study these practices were not entered into the multivariate model derived to determine

factors influencing the initiation of breast-feeding as it is unlikely that these practices influence a woman's choice of feeding method given that the majority of women had decided how they would feed their infant well before being admitted to hospital. While this and other studies have identified a univariate association between initiation of breast-feeding and practices such as rooming-in and demand feeding, it is impossible with univariate analysis to determine if this is a direct cause effect association. For instance, Samuels et al. (1985) found that among the women who chose to room-in, 80% chose to breast-feed, whereas only 58% of those women who placed their infants in the nursery chose to breast-feed. Given that most women choose how they intend to feed their baby well before they are admitted to hospital it is unlikely that the practice of rooming-in has a direct effect on breast-feeding initiation. Rather, the association is probably indicative of attitude; mothers who choose to breast-feed are also those who are likely to room-in.

On the other hand, it is possible that hospital practices may influence breast-feeding duration and practices such as rooming-in, early infant-to-breast contact and demand feeding were included in the model to determine factors independently influencing breast-feeding duration. However, none of these practices were found to influence breast-feeding duration in this study.

Demand feeding which involves frequent feedings has previously been positively associated with breast-feeding duration by Hewat (1986) who reported two common themes among women who had breast-fed for more than 6 months. Firstly, they breast-fed immediately after delivery and secondly they breast-fed frequently during the establishment phase. Many women fed every 2 hours for 6-12 weeks, which was the time they described as needed to establish breast-feeding.

De Carvalho et al. (1983) demonstrated that when compared with scheduled infant feeding, frequent and unrestricted breast-feeding increased milk production. A positive association between frequent feeding and milk

production was also demonstrated by Feinstein et al. (1986) in a study of the effect of formula samples and other hospital related factors on breast-feeding success. When compared with women who were totally breast-feeding at one month, significantly fewer women who were partially breast-feeding at one month continued to breast-feed for 16 weeks. However, partial breast-feeders who nursed more than seven times per day had breast-feeding durations as long as the mothers who were totally breast-feeding. This suggests that frequent suckling may compensate for the inhibiting effects of early formula supplementation on milk production.

In addition to its effect on milk production and infant weight, frequent suckling has been associated with a variety of other benefits for both the mother and the infant. For the mother it is associated with decreased ovulation and improved contraception (Jain and Bongaarts 1981; Thapa et al. 1988) and for the infant, it has been associated with lower serum bilirubin levels (Yamauchi and Yamanouchi 1990).

'Feeding schedules' became popular towards the end of the last century. Prior to this most infants were breast-fed as hunger demanded, which is still the pattern favoured in most traditional societies. In these societies unrestricted feeding consists of *ad libitum* day and night feedings, facilitated by close contact between mother and infant and absence of cultural sanctions limiting nursing to specific times or places (Quandt 1986). Millard (1990) contends that the concept of a rigid feeding interval originated in the 'routine of hospital nurseries, where work is organised on schedules and efficiency in the use of time is emphasised'. Similarly, Apple (1994) describes the 'medicalisation' of infant feeding in the early 1990s, characterised by fixed feeding schedules and the thorough cleansing of the mother's breasts to avoid the danger of the mother contaminating the child. Neither practice being conducive to breast-feeding, especially in the early days when a mother is attempting to establish the flow of her milk.

In this study, other hospital practices such as early infant-to-breast contact were not associated with breast-feeding duration. Again, this finding is inconsistent with earlier studies which suggested that mothers who failed to breast-feed within the first two hours of birth were more likely to wean their babies early (Whichelow and King 1979; Wright and Walker 1983; Ferris et al. 1987; Buxton et al. 1991; Lawson and Tulloch 1995)

Bernard-Bonnin (1989) conducted a meta-analysis of four controlled trials studying the influence of hospital practices on breast-feeding duration and concluded that early mother-infant contact positively influenced breast-feeding duration. However, Perez-Escamilla et al. (1994) more recently conducted a rigorous review of 14 studies on the effect of early contact on lactation success and concluded that the impact of early contact was unclear. While it may be beneficial among primiparae, it was not possible to attribute breast-feeding rates directly to early contact as several studies also included breast-feeding guidance by health personnel or the presence of the father during early contact.

Similarly, Kearney et al. (1990), after reviewing 10 studies, concluded that there was little evidence to support the belief that delayed first feeding is an independent cause of breast-feeding failure. They argued that delayed breast-feeding was most likely to occur in those hospitals that were generally unsupportive of breast-feeding, and it was probably this lack of support which contributed to breast-feeding failure. They showed that breast-feeding support in the hospital environment and maternal commitment could over-ride the negative impact of delivery methods and delayed first breast-feeding.

While a variety of hospital practices have been associated with the onset and success of breast-feeding using unviariate analysis, it is difficult to draw definitive conclusions from the literature as most of the studies have suffered serious methodological limitations, primarily due to non-randomisation of subjects. Other common problems include variable definitions of breast-

feeding and weaning and attribution of causation to findings that were simple associations (Cronenwett et al. 1992). Many hospital practices are inter-related and coexist. For instance, those hospitals which, in the past, did not encourage rooming-in were likely to offer supplementary feedings in the nursery and unlikely to support and encourage demand feeding.

Perez-Escamilla et al. (1994) critically reviewed the literature and used meta-analysis to examine the plausibility of a causal relationship between maternity ward practices and lactation success. Of the 65 studies that they reviewed only 18 met their inclusion criteria, that is, hospital-based intervention, experimental design with randomisation procedures, or quasi-experimental design and adequate documentation. Few of the studies reviewed had been conducted as randomised trials or quasi-experimental studies. Several studies suffered from questionable internal validity, that is, they contained between-group socio-economic differences, self-selection of participants, assignment to group based on physician's wishes, and exceedingly high and unevenly distributed attrition rates. Where mothers had been randomly assigned to control and intervention groups, the interventions often incorporated a number of ward practices, for example rooming-in and the provision of breast-feeding guidance, making it difficult to determine the impact of individual practices.

The last decade has seen hospitals increasingly adopt practices in line with the WHO Baby Friendly Hospital Initiative. Yet despite these changes breast-feeding initiation rates have remained static and even fallen in some countries, and the majority of women wean before 6 months. This suggests that some factor, or factors, external to the hospital environment probably exerts a greater influence on breast-feeding outcome than hospital procedures. Maternal commitment may be the deciding factor, as several researchers have demonstrated that negative hospital routines have minimal effect on breast-feeding success for those women who are highly motivated and committed to breast-feeding (Kearney et al. 1990; Cronenwett et al. 1992).

There is some evidence to suggest that breast-feeding information given as part of antenatal classes may positively influence duration of breast-feeding. For instance, Ford et al (1994) reported that attendance at antenatal classes was positively associated with the likelihood of exclusive breast-feeding on discharge and with longer duration of breast-feeding. Similarly Piper and Parks (1996) reported that mothers who had participated in childbirth education classes were more likely to breast-feed for longer than six months when compared with non-attenders (OR=1.46 CI $_{95\%}$= 1.14-1.90).

Again it is difficult to determine the direction of the association between attendance at antenatal classes and breast-feeding practices. A positive association does not necessarily mean that antenatal education influences the decisions and behaviours of women. Rather the association may be the result of self-selection (Piper and Parks 1996). That is health conscious women who elect to take antenatal classes may also elect to breast-feed.

In this current study attendance at antenatal classes for this or a previous pregnancy was not associated with either breast-feeding initiation or duration. This is in keeping with the findings of Cronenwett and Reinhardt (1987) who reviewed a number of descriptive, correlational and quasi-experimental studies to determine the effect of professional support on the breast-feeding decision. Their findings suggest that health care providers are rarely perceived as sources of influence on the feeding decision or as sources of help or support with breast-feeding. This contrasts with the perceptions of health care providers who tend to see themselves as the most important source of influence on mothers' decisions about breast-feeding and view as secondary importance the influence of friends, husbands and relatives.

8.2.4 Social support and breast-feeding initiation

While lactation may be natural, breast-feeding is not instinctive but must be learned. Once learned a woman needs to be in a socially supportive

environment if she is to be successful (Brack 1975). In traditional societies breast-feeding women are supported by a *doula.* This person (frequently the mother of the new mother) supports the new mother emotionally, provides practical advice and guidance and helps her with household duties, allowing her time to relax, establish her milk supply and become adjusted to her infant's needs (Barron et al. 1988). The concept of a *doula* is common in most of the world except Western societies (Hall 1978). An outcome of social changes in modern societies is the loss of support for women to breast-feed, which traditionally was provided by the doula. When the extended family is absent women may rely heavily on partners to support their breast-feeding decision and to help with household responsibilities (James et al. 1994).

Social support is likely to be useful to the individual only to the extent it is perceived as supportive. 'Too much' or 'too little' help has been identified by mothers as a stressor, while 'enough' help was identified as support. Matich and Sims (1992) found that women with a moderate amount of support were more likely to intend to breast-feed than women with either high or low amounts of support. Rather than being supportive of breast-feeding, friends and family are often a major source of information about problems associated with breast-feeding and in this way discourage women from breast-feeding (Bryant 1982).

This argument is supported by a Brazilian study which found that while the presence of a maid was positively associated with breast-feeding duration, having a relative help with housework was negatively associated with breast-feeding duration. Usually the mothers who could afford a maid were more educated (a reason for breast-feeding more) and also they had more time to relax and be with the baby. However, the authors argued that relatives, usually grandmothers, may actually interfere negatively with breast-feeding. They proposed that older relatives in general come from a generation that breast-fed less and this could have a negative influence on the new mothers (Giugliani et al. 1992).

Social support for breast-feeding may decline with time. Morse (1989 p. 230) suggests that:

> *"breast-feeding is a dynamic relationship involving significant others beyond the 'nursing couple', and the attitudes of these 'others' change toward the breast-feeding mother over the course of lactation. Initially these significant others support the mother in her breast-feeding. But when the infant is considered 'old enough to wean', these others facilitate weaning."*

Ferrris et al. (1987) reported that while the amount of perceived emotional support that a mother received did not affect how long she nursed, mothers generally believed at 10 weeks postpartum that their partners and family members were less supportive of their nursing than at 2 weeks. Hewat and Ellis (1986) reported also that women often receive 'not too subtle' advice from some family and friends when they thought the mother had breast-fed for long enough. They suggested that "there seems to be an unwritten law in today's society that a woman *must* breast-feed, but only for so long (p42)."

Until recently, most research investigating factors influencing the decision to breast-feed has focused on characteristics of the mother-infant pair, with relatively little attention being paid to the role of the father. Earlier research demonstrating that married women were more likely to breast-feed than single women (Rassin et al. 1984; Samuels et al. 1985; MacGowan et al. 1991) suggests that fathers play some role in the mother's decision to breast-feed. More recent research focusing on fathers indicates that they participate in and influence the choice of infant feeding method, and influence duration by acting as key supports or deterrents to breast-feeding by the mother (Jordon and Wall 1993).

Most research into the role of the father in supporting breast-feeding has been conducted in the USA where breast-feeding initiation and duration rates are

considerably lower than in Australia. In one study of low income women, father's preferred method of feeding was the second most important factor influencing their partner's decision to breast-feed (Black et al. 1990). Bevan (1984) in an earlier study of a similar population found that father's preference exerted a significant influence over both the incidence and duration of breast-feeding.

Littman et al. (1994) demonstrated that strong approval of breast-feeding by the father was associated with a high incidence of breast-feeding (98.1%) compared with only 26.9% breast-feeding when the father was indifferent to feeding choice ($p < .001$). In this study, approval of breast-feeding by the father was also associated with a higher incidence of breast-feeding, 96.5% compared to 72.1% breast-feeding when the father preferred bottle-feeding or was ambivalent about the feeding method ($X^2 = 59.977$ df = 1 p=.000). Fathers in the professional/administration occupational group were more likely to prefer breast-feeding than fathers in the lower status occupational groups (X^2 8.07 df = 3 p=.045).

In this study, there was a strong positive association between the decision to breast-feed and the father's preference for breast-feeding, as reported by the mother. Women who perceived their partners to prefer breast-feeding were more likely to initiate breast-feeding than women who perceived their partners to prefer bottle-feeding or to be ambivalent about how they fed their infant (OR= 10.18 $CI_{95\%}$ 4.42 - 23.42). Father's attitude was associated also with breast-feeding duration. Women who perceived their partners preferred bottle-feeding or were ambivalent about the feeding method were more likely to have stopped breast-feeding at any time compared with women who perceived their partners to have a preference for breast-feeding (RR=1.52 $CI_{95\%}$ 1.04 - 2.21). The results of this study both support and strengthen the findings of previous studies which were limited to one setting, as this study involved women from two maternity hospitals, and controlled for potentially confounding demographic and biomedical variables.

Giugliani et al. (1994) reported that the father's opinion about breast-feeding was the most important factor related to breast-feeding, regardless of maternal age, educational level, ethnic group and marital status. Mothers who said that their partners favoured breast-feeding were significantly more likely to breast-feed, compared with mothers whose partners either preferred bottle-feeding or were ambivalent about infant feeding (OR 32.8 $CI_{95\%}$ 6.7-159.5). Birenbaum et al. (1989) also used multivariate analysis techniques to study the interdependence of factors influencing the initiation of breast-feeding. They reported that husbands' opinions regarding breast-feeding appeared to be the major determinant for the initiation of breast-feeding in a population of Israeli women.

In this current study and the study conducted by Birenbaum et al. (1989), fathers were not specifically interviewed and the answers represent the mothers' opinions of the husbands' attitudes. Obviously, their answers may be biased by the mother's own decision. For instance, a mother who is herself feeling ambivalent about breast-feeding might influence and/ or misinterpret her partner's attitudes. Alternatively, the mother may have accurately perceived her partner's attitude to breast-feeding due to her knowledge and comprehension of his attitudes to other aspects of her bodily and emotional life.

The level or amount of support provided by the father will depend on his commitment to, and expectations of, breast-feeding (Gamble and Morse 1992). Freed et al.(1992) proposed that variations in support for breast-feeding among fathers might be explained by a lack of information or the harbouring of negative cultural perceptions. Previous studies have found that fathers of bottle-fed children were more likely to believe that breast-feeding is bad for the breasts, makes breasts ugly, interferes with sex, is painful and that prevention of sore and cracked nipples is not possible (Freed et al. 1992; Giugliani et al. 1994). When compared with fathers of breast-fed infants,

fathers of children who were bottle fed were generally unaware of the benefits of breast-feeding for either their child or their partner and were comparatively less aware of how a father can provide practical and psychological support for breast-feeding (Freed et al. 1992; Giugliani et al. 1994).

Fathers who had other breast-fed children, who attended antenatal classes and who had discussed breast-feeding with health professionals during antenatal care were more knowledgeable about breast-feeding (Freed et al. 1992). However, while fathers of breast-fed infants were better informed several recent studies have shown that fathers, in general, have poor knowledge about breast-feeding. Fathers often do not possess the technical knowledge required to provide the psychological support and physical assistance required by newly delivered breast-feeding mothers (Freed et al. 1992; Giugliani et al. 1994).

The results of the focus group discussions with mothers illustrated the importance of paternal support. Several, commented that the support of their partner was a major incentive for continuing to breast-feed..

> *My husband really wanted me to breast-feed. When I was having problems with the first one he put posters (up) all over the house saying 'You can do it, you can breast-feed'. I know he wanted me to breast-feed. (Mothers group)*

The last half century has seen dramatic changes in the parenting role of fathers. Fathers are now encouraged, and expected, to be present at the birth of the child and to participate in antenatal programs. In addition, they are expected by health care professionals to encourage and support breast-feeding. However, not all fathers will have positive reactions to breast-feeding. New fathers may experience negative and conflicting feelings such as jealousy, inadequacy, exclusion and sexual frustration (Waletzky 1979). Fathers (and their partners) often have an idealised picture of postpartum

happiness and are unprepared for these negative feelings and unaware of the particular emotional problems that may relate to breast-feeding.

Fathers participating in focus group discussions generally felt that, despite being excluded from infant feeding, they were still able to contribute to infant care in other areas. Most felt that once their child had been weaned that their relationship with their infant changed and that they 'caught up' to the mother with regard to infant bonding. However, this is not always the case and several researchers have highlighted the fact that breast-feeding perpetuates the exclusive mother-infant relationship that existed during pregnancy (Waletzky 1979). This can result in the father feeling "excluded, jealous and resentful to the detriment of the breast-feeding success and the adult couple relationship" (Jordon and Wall 1993).

The results of this and other studies highlight the need for including fathers in breast-feeding discussions. However, few opportunities exist for fathers to prepare themselves to offer the emotional and practical support required by their partners (Waletzky 1979) and health professionals should seek ways of including fathers in breast-feeding discussions. For instance, breast-feeding literature should not focus solely on the mother-infant pair but should highlight the role that partners can play in supporting and encouraging the breast-feeding mother (Freed et al. 1992). Antenatal classes as they are currently conducted were not found to exert an independent influence on the mother's decision to breast-feed. However, if the amount of time spent on discussing the nutritive and protective advantages of breast-feeding in early parenthood and antenatal classes was expanded to allow time for explanation of the supportive roles fathers can play in the breast-feeding process, it is possible that classes would exert a favourable influence on the father's attitude towards breast-feeding. This in turn would influence the mother's decision, given the association between father's attitude and her decision to breast-feed, as demonstrated by the results of this study.

Classes which encourage both partners to discuss their attitudes to breast-feeding would be useful, as Freed et al. (1993) in a US study showed that women were unable to accurately predict their partner's attitudes and opinions regarding breast-feeding, despite having reported that they had discussed infant feeding plans with their partner. A large number of women incorrectly predicted negative responses from fathers, raising the possibility that the father's negative influence on breast-feeding is based on the mother's inaccurate perceptions. Perception of a lack of spousal support may decrease enthusiasm for breast-feeding among women who had planned to initiate lactation.

Almost all of the women (89.9%) knew how their mothers had fed their infants, suggesting that the topic had been discussed, and almost three-quarters (70.8%) of the maternal grandmothers had breast-fed. Breast-feeding was more common amongst women whose own mothers had breast-fed compared with women whose mothers had bottle-fed (87.0% vs 76.4%) (X^2 = 9.402 df = 1 p <.002). Whether a woman's own mother had breast-fed at least one child was associated with the initiation of breast-feeding. After controlling for covariates and confounding factors, women whose mother had breast-fed were more likely to breast-feed as a woman whose mother had bottle-fed or who didn't know how her mother had fed her children (OR 1.89 $CI_{95\%}$ 1.02 - 3.50). Maternal grandmothers who had breast-fed an infant were more likely to be reported by their daughters as having a preference for breast-feeding (X^2 = 31.58 df =1 p < .000). Cox and Turnbull (1994) in a study of Tasmanian women suggested that a woman's decision to breast-feed was positively affected by the role model of her mother. They found that women who had been breast-fed as an infant were significantly more likely to breast-feed their own infants.

Whether a woman's mother had ever breast-fed was not found to be associated with breast-feeding duration in this study. This is inconsistent with the findings of several studies which have demonstrated that whether a

woman was herself breast-fed as child was a strong predictor of duration (Entwisle et al. 1982; Jones et al. 1986; Fitzpatrick et al. 1994), although the reasons for this are not clear. It is possible mothers have passed onto daughters a strong resolve to breast-feed, despite the problems or, alternatively that they provide more support, encouragement and even instruction (Jones et al. 1986). However, whether or not the woman's mother helped in her first two weeks at home after return from hospital was unrelated to breast-feeding success in a study by Entwisle et al. (1982). They proposed the most likely explanation to be that positive attitudes toward breast-feeding came about through socialisation during childhood. This socialisation prompted women to select breast-feeding and helped the women to be successful by perhaps increasing their expectations of success.

A number of studies have shown that breast-feeding duration is also strongly associated with when the decision to breast-feed is made. In general, the earlier the decision to breast-feed is made, the longer the duration (Goodine and Fried 1984; Jones et al. 1986; Grossman et al. 1990; Buxton et al. 1991; O'Campo et al. 1992). Jones et al. (1986) suggest that an early decision might indicate a stronger desire and determination to breast-feed and hence enable mothers to overcome difficulties and to continue breast-feeding.

In this study, 66.2% of all women had decided on their preferred method of feeding before they conceived. The majority of breast-feeding women (71.1%) had made their decision before conception, whereas, the majority of women who were artificially-feeding their infants (56.7%) made their decision during their pregnancy. There was an association between when the decision on how to feed the infant was made with the initiation of breast-feeding but there was no association with breast-feeding duration. Women who chose their feeding method before becoming pregnant were more likely to breast-feed than women who chose their feeding method after becoming pregnant (OR 3.27 $CI_{95\%}$ 1.72 - 6.04). Grossman (1990) also reported that

women who chose their feeding method before conception were more likely to breast-feed than women who made their decision at a later time.

The theory that women have a predetermined breast-feeding goal which they tend to fulfil regardless of intervening events is further strengthened by the finding in this study that intended duration of breast-feeding was strongly associated with actual breast-feeding duration. Mothers who intended to stop breast-feeding before four months postpartum were more likely to have stopped breast-feeding at any time (RR = 5.05 $CI_{95\%}$ 2.85 - 8.80) compared with women who intended to breast-feed for at least four months. Similarly, women who were undecided about how long they would breast-feed more likely to stop breast-feeding than women who intended to breast-feed for four months or more (RR = 1.60 $CI_{95\%}$1.03 - 2.50).

A consistent association has previously been reported between intended duration of breast-feeding and actual duration (Loughlin et al. 1985; Grossman et al. 1990; Cronenwett et al. 1992; Lawson and Tulloch 1995). Quarles et al. (1995) reported that, after controlling for potentially confounding demographic factors such as maternal age, level of education, race, parity and socio-economic status, intended duration was the strongest predictor of the actual duration of breast-feeding. It has been suggested that anticipated duration reflects maternal confidence and motivation (Loughlin et al. 1985). Entwisle et al (1982) assumed these prenatal intentions to be the consequence of a long socialisation history prior to pregnancy.

This association between intended duration and actual duration is consistent with the theory of reasoned action (Fishbein and Ajzen 1975). One component of the theory states that most actions of social relevance are under volitional control, and that individual intention to perform an action is an immediate determinant of that action. The intention to perform a given behaviour results from a person's attitude to the behaviour and how s/he perceives others to feel about the behaviour (i.e. subjective norms). O'Campo

et al. (1992) suggest that simply asking a woman how long she intends to breast-feed is an efficient method of identifying who is at risk of breast-feeding for a short duration.

Coreil and Murphy (1988) demonstrated that women choose how they intend to feed their infant and how long they want to breast-feed their infants at least as early as the third trimester of pregnancy and that they tend to fulfil those expectations regardless of intervening events. This finding highlights the importance of early intervention for extending breast-feeding duration. As perceived self-confidence was intercorrelated with intended duration, they suggest interventions designed to strengthen positive attitudes towards breast-feeding might be most effective in prolonging breast-feeding.

In this study, an intention to return to work or study, either in a full- or part-time capacity, was not found to be associated with either the initiation or duration of breast-feeding. While return to employment is often cited as a major reason for the decision to bottle-feed or early cessation of breast-feeding (Simopoulos and Grave 1984; Feinstein et al. 1986), the results of studies which have investigated the effect of employment on breast-feeding rates are inconsistent. These inconsistent findings are probably due to methodological differences in the way in which the relationship between breast-feeding and employment has been studied. For instance, in this and other studies the effect of *intention* to return to work on breast-feeding initiation and duration was studied while others have investigated the impact of *actual* return to work. Another contributing problem is that few studies have been specifically designed to test the relationship between these factors. For instance, in this study while mothers may have voluntarily cited return to work as a primary reason for ceasing breast-feeding they were not directly asked if they had returned to work and at what time post-partum they had returned to work.

In general, intention to return to work has not been shown to negatively influence the decision to breast-feed. Littman et al. (1994) in a recent study designed to evaluate specifically the effect of working outside the home, demonstrated that intention to return to work post-partum was not associated with intention to breast-feed. They reported that 67.9% of working mothers, compared with 67.2% of those who did not plan to work postpartum, planned to at least partially breast-feed. Similarly, Birenbaum (1989) in a study of Israeli women found that plans to return to work after the delivery did not influence the initiation of breast-feeding.

While Carlson Geilen et al. (1991) in a US study found no association between intended return to work and initiation of breast-feeding, actually being employed was significantly associated with the early cessation of breast-feeding. This finding suggests that while breast-feeding mothers may fully intend to continue to breast-feed once they return to work, unsupportive work environments and the stress of combining work and motherhood may combine to prevent them from attaining this goal.

Studies which have investigated the relationship between actual return to work and breast-feeding rates have also reported inconsistent results. Martinez et al. (1981), in a large, cross-sectional, USA national survey conducted in 1980, found that mothers who were not employed outside the home at the time of the survey were more likely to have initiated breast-feeding and to breast-feed for longer than mothers who were employed full-time at the time of the survey. However, by 1984, the incidence of breast-feeding was higher among employed women than among unemployed women. However, for infants at 5 and 6 months of age, the proportion of unemployed women breast-feeding was higher (Martinez and Krieger 1985). This disparity at six months between mothers not employed and those employed increased from an odds ratio of 1.65 in 1984 to 2.43 in 1989 (Ryan et al. 1991). Stahlberg (1985), in a Finnish study conducted in the mid 1980s,

reported that mothers employed outside of the home had breast-fed their children for a longer time than mothers staying at home.

It is possible that maternal employment has exerted a stronger influence in the past decade as the number of women with children either remaining in, or re-entering the workforce increases (Castles 1993). More recent studies in Denmark and the USA provide evidence that return to work negatively affects the duration of breast-feeding (Weile et al. 1990; Cronenwett et al. 1992). Piper and Parks (1996) analysed data from the US 1988 National Maternal-Infant Health Survey and found that women who delayed their return to work until at least six months post-partum were more likely to breast-feed past six months compared to women who returned to work before this time. Conversely, the results of a large national study of mothers in England, Wales, Scotland and Northern Ireland (White et al. 1992) indicated that early return to work (6-10 weeks postpartum) did not significantly deter women from breast-feeding initially nor influence the duration of breast-feeding. There was virtually no difference in the duration of breast-feeding between mothers who did not work at all during the first nine months and those who had worked throughout this period.

According to Birenbaum (1989) employment *per se* does not appear to be a reason for not breast-feeding. However, the timing of return to work, the availability of part-time work and facilities in the work place may influence the mother's breast-feeding experience. Different regulations with regard to paid or unpaid maternity leave may help explain the inconsistent findings regarding the effect of maternal employment on breast-feeding initiation and duration. For instance, all working mothers in Israel receive 3 months' fully paid maternity leave with a legal option of a further 9 months' unpaid leave without compromising their employment status. Similarly, women in Australia, while not all receive paid maternity leave, are legally entitled to 12 months maternity leave, retaining the right to return to their previous

positions after this time. This security may have a positive influence on the working mother's decision to breast-feed.

8.3 Mothers' breast-feeding experiences

8.3.1 Enjoyment of the breast-feeding experience

How a woman felt about the breast-feeding experience at two weeks postpartum was a strong indicator of breast-feeding duration. Women who breast-fed for four or more months were more likely to have been confident breast-feeding (unadjusted OR = 2.65 $CI_{95\%}$ 1.47 - 4.85) and to have expressed satisfaction with the experience (unadjusted OR = 2.42 $CI_{95\%}$ 1.33 - 4.35) compared with women who breast-fed for less than the recommended four or more months. However, they were no more likely to have found the experience more enjoyable (unadjusted OR = 1.63 $CI_{95\%}$ .98 - 2.70),

Redman et al. (1995), in a recent study of Australian women, reported that women who continued to breast-feed to at least four months were more likely to have enjoyed breast-feeding (OR = 4.76 $CI_{95\%}$ 2.24 - 10.20) or to have found it satisfying (OR = 11.11 $CI_{95\%}$ 4.42 - 23.25) than women who stopped breast-feeding before four months. Sjölin et al. (1977), in an earlier study of Swedish women, also reported that mothers whose breast-feeding experience had been a positive experience breast-fed for longer than those whose experience was not positive.

In this study older mothers had more positive breast-feeding experiences than younger women. This finding is similar to that of Jones (1986) who reported that older women tended to be more satisfied with their breast-feeding experience than younger mothers and that those who previously breast-fed one or more children reported significantly higher levels of enjoyment and satisfaction than did others. No association was found in this study between breast-feeding experiences and parity or years of education.

8.3.2 Embarrassment with breast-feeding

Embarrassment or distaste of breast-feeding are commonly cited by Canadian women as reasons for not breast-feeding (Mathews et al. 1995). Similarly, Fitzpatrick et al. (1994) in a study of Irish women reported that 31% of 100 bottle-feeding mothers studied indicated that they would be too embarrassed to breast-feed in front of their partner. Barron et al. (1988) in a study of low-income women in the USA, found that willingness to breast-feed in front of others (particularly a male other than their partner) appeared to contribute to the increased duration of breast-feeding. In this study, short-term breast-feeders (those who had weaned before 6 weeks) were significantly less comfortable with breast-feeding in front of males and strangers than long-term breast-feeders (those who were still breast-feeding at 24 weeks).

In this study, embarrassment of breast-feeding increased with reducing closeness of the relationship, i.e. the highest proportion were embarrassed in front of strangers or acquaintances followed by neighbours, friends and relatives. Furthermore, long-term breast-feeders, were less embarrassed to breast-feed in public situations than short-term breast-feeders. This result is consistent with the findings of others (Jones 1986; Jones et al. 1986; Barron et al. 1988) who found that women who are willing to breast-feed in front of others (particularly a male other than their partner) breast-feed longer than women who are not comfortable doing so.

8.3.3 Breast-feeding problems

Most mothers do not anticipate problems with breast-feeding, but most will experience problems of some kind. For example, in a study of US women (Hall 1978), 88% of mothers did not anticipate problems, but 63% reported that they did, in fact, experience problems. In this study, 82.6% of women reported having difficulties while in hospital. An earlier study of Melbourne women reported even higher rates of difficulties with 96% of mothers

reporting at least one problem with breast-feeding during the first week postpartum (Lowe 1988). At this stage many women experienced difficulty with the actual breast-feeding techniques of positioning and attachment or experienced breast-related problems such as sore, cracked or blistered nipples.

Jones (1986) in a UK study reported that more than half (51%) of women had experienced problems with breast-feeding. Again the most frequently mentioned problems were breast-related, being sore breasts (18%), cracked nipples (17%), engorgement (10%), and leaking (10%). Significantly more primiparous mothers reported problems than multiparous mothers. Similarly, in our study primiparous women (89.9%) were more likely to experience problems than multiparous women (79.6%) ($X^2 = 7.598$ df = 1 p = .006).

Jones (1986) reported that the degree of enjoyment was associated with breast-feeding problems; those reporting no problems experienced significantly more enjoyment than those who had problems. Similarly in our study, women who experienced no problems had more positive breast-feeding experiences than women who reported having experienced problems (mean score = 4.55 versus 4.26 p = .000).

Apparent differences in the rate of breast-feeding problems, that is 51% for a study of British mothers (Jones 1986) and 96% in the study of Melbourne women by Lowe (1988) does not imply that British women have, in general, fewer problems than Australian women. Instead, it probably reflects differences in the way in which the information was elicited. Neither study clearly indicated how the data was collected. However, a survey in which women are presented with a structured list of common breast-feeding problems and asked to nominate which of the problems they had experienced is likely to result in a higher rate of breast-feeding difficulties than a study in which women were asked to list unprompted any breast-feeding difficulties that they had experienced.

Furthermore, some women may not even consider common breast-feeding events to be a 'problem', as evident in a study of US mothers. Kearney et al. (1990) found that while 66% of women experienced sore nipples within seven days postpartum, only 21% defined this event as an occurrence which was either *usually manageable, sometimes a problem,* or *very difficult to manage, makes me consider weaning.* Similarly, 59% of women had experienced leaking breasts but only 10% considered this to be a 'problem'. A similar finding was reported by Fetherston (1995) in a recent study of Perth women delivering at a private maternity hospital. She reported that while the most common problem experienced by breast-feeding women during hospitalisation was sore nipples (71%), only 15% of these women considered weaning because of this problem.

The 'breast is best' message promulgated in antenatal classes and other intervention strategies is often accompanied by the unspoken message that 'breast-feeding is natural'. Women are often misled by this message (Hewat and Ellis 1986), perhaps because they misinterpret it as implying that breast-feeding 'comes naturally'. While lactation may be 'natural' breast-feeding is 'learned'. The impact of breast-feeding problems on duration may be related more to unrealistic expectations of women rather than the severity and nature of breast-feeding problems.

Furthermore, breast-feeding problems do not necessarily have to lead to termination of breast-feeding. Fahy and Holschier (1988) found that successful breast-feeders (still breast-feeding at 6 weeks) had more problems than unsuccessful breast-feeders (weaned before 6 weeks). They suggested that 'successful breast-feeding is not so much the result of a problem-free postnatal period but the mother's ability to accept and deal with problems as they arise'.

It is apparent from this study and the literature that breast-related problems are common during the establishment stage of breast-feeding. However, these

difficulties, while common, are not necessarily inevitable and with proper education in the art of breast-feeding can be either prevented or successfully managed. For instance, most problems related to cracked or sore nipples and breast engorgement can be prevented by teaching correct positioning and attachment of the infant to the breast (Bear and Tiggs 1993; Moulden 1994). Women may not become so easily frustrated and discouraged if they are forewarned prenatally of the occurrence of some of these common problems and are given information, anticipatory guidance and encouragement to deal with them (Hewat and Ellis 1986).

Jones (1986) found that one of the main reasons for women not wanting to breast-feed again was the physical problems that they experienced while breast-feeding a previous child. This finding illustrates the deleterious consequences of the physical problems which are commonly experienced in the early days of breast-feeding and highlights the benefits that would accrue could these be prevented or at least ameliorated.

8.3.4 Reasons for terminating breast-feeding

It is difficult to determine why mothers stop nursing because several factors are usually involved, not just one. Sjolin et al. (1977) suggest that a change in feeding method is most often characterised by a chain of events that precede the change, and that it is this chain rather than the static end point that is the 'real' reason for discontinuation.

The chain of events may start with hospital routines (e.g. delay in breast-feeding) which negatively influence the establishment of breast-feeding and set the stage for problems which may subsequently lead to cessation. If a woman does not effectively establish lactation in the first few days postpartum or is unsure of her breast-feeding ability, she will often turn to the use of supplements, which reduce nipple stimulation and breast emptying, thus affecting milk supply (Ferris et al. 1987). Most women who in the first few weeks postpartum add formula to an infant's diet do so out of concern

over the adequacy of their milk supply, not with the intention of weaning. Women who are confident about their breast-feeding ability may use less supplementation, thus improving their breast-feeding success.

In this study the most common reasons cited by the mothers for stopping breast-feeding prior to two weeks was that the baby was unsettled, a behaviour often interpreted by mothers as indicating an insufficient milk supply. Thereafter, unsettled infant behaviour and concern about the adequacy of her breast milk were the most common reason given for the early cessation of breast-feeding. Inadequate milk syndrome (IMS) or breast milk insufficiency is the most commonly cited reason for the early termination of breast-feeding amongst women in Western societies (Loughlin et al. 1985; Feinstein et al. 1986; Hill 1991; Hillervik-Lindquist et al. 1991; Birenbaum et al. 1993; Essex et al. 1995). This may or may not reflect the true reasons for cessation of breast-feeding by individual women, as it has been suggested that 'insufficient milk' is given by some mothers as a socially acceptable reason to stop breast-feeding, when a woman decides she no longer wishes to do so (Hitchcock and Coy 1988). Quandt (1986) questioned whether mothers' claims of insufficient milk should be taken literally when they occur in cultural contexts which devalue breast-feeding and present the use of commercial formulas as an acceptable - if not preferred- alternative.

While many mothers perceive a 'lactational crisis', in most cases this is not physiologically real (Hillervik-Lindquist et al. 1991). According to Feinstein et al. (1986), fewer than 5% of nursing mothers may be physiologically incapable of producing sufficient milk due to inadequate glandular lactation tissue. Real milk insufficiency is most often a technical problem due to inadequate suckling frequency or an overly stressful environment. In those cases where breast-milk production may decrease, it is usually of relatively short duration - less than four days- and successfully overcome by proper breast-feeding techniques in a few days (Verronen 1982). Most transient lactational crises occur in the first three months of lactation, often in the first

two to six weeks, which is a critical time for establishing lactation (Goodine and Fried 1984; Loughlin et al. 1985).

Perceived breast milk insufficiency is not confined to Western societies and IMS is becoming increasingly prevalent in 'traditional' societies and is viewed as a symptom of the breakdown of traditional patterns of social support for breast-feeding. Consequently, women everywhere are at risk of doubting the adequacy of their breast milk both in terms of quality and quantity (Tully and Dewey 1985). This doubt makes mothers particularly susceptible to the influence of family and friends who may suggest that the quantity and/or quality of the mother's milk may be deficient in some way.

Real or perceived breast milk insufficiency can have long term consequences which extend beyond the current breast-feeding experience. Da Vanzo et al. (1990) found that only 61.5% of mothers breast-fed a subsequent child if breast milk insufficiency was the reason given for discontinuing breast-feeding their first child. This was compared with over 90% of mothers who breast-fed subsequent children after discontinuing breast-feeding their first child because the 'child no longer needed to breast-feed'. This finding indicates that women who breast-feed their first child are less likely to breast-feed a later-born if the first breast-feeding experience was perceived to be unsuccessful and highlights the need to provide anticipatory guidance to prevent and manage real or perceived breast milk insufficiency.

Mothers often misdiagnose infant behaviours such as restlessness, either during or between feeds, and increased demand for feeds as signs of an insufficient milk supply. This increased demand for more frequent feeds is often associated with growth spurts which occur at approximately 2-3 weeks, 6 weeks, 3 months and 6 months of age (Hill 1992). Lawson and Tulloch (1995) found that most mothers self-diagnosed breast milk insufficiency on the basis of subjective assessment of infant behaviour. Very few of their

subjects mentioned recognised reasons such as nappy count, baby being listless, or failure to 'let-down' as a measure of supply.

The results of this and other studies confirm that mothers' knowledge about the range of normal behaviours of breast-fed infants is still lacking. Infant hunger cycles are far from regular, either from day to day in the same infant or from one infant to another. Western fixation with the importance of time coupled with the expectation that all infants should sleep through the night and feed at regular intervals has resulted in women distrusting and ignoring their own bodily signals and the behaviour of their infant in establishing breast feeding patterns (Millard 1990). Lawson and Tulloch (1995) suggest that being aware of these differences may help mothers in seeing their breast-feeding relationship as falling within the realms of normality, perhaps preventing the unnecessary introduction of breast milk substitutes.

One of the most objective ways of assessing adequacy of breast milk is by monitoring infant growth. However, it has been shown that the growth patterns of breast-fed infants differ from those of bottle-fed infants. Dewey et al. (1995) demonstrated that infants breast-fed for at least 12 months grew more rapidly for the first 2 months and less rapidly (particularly in weight) from 3 to 12 months when compared with the WHO/CDC reference data. This deceleration may be inappropriately interpreted as growth faltering, even if the infant is healthy and thriving. Dewey et al. contend that as a consequence, mothers may be counselled that their breast milk production is inadequate and that complementary foods should be added, thus undermining the confidence of the mother.

The results of this study and other studies suggest that the perception of inadequate milk supply may be due to the mother's misunderstanding of the infant's behaviour as hunger or misinterpretation of normal physiologic changes of the breasts as cessation of milk production (Loughlin et al. 1985). The problem of perceived milk insufficiency can be alleviated with

anticipatory guidance which alerts the mother to the likelihood of changes in the infant's feeding patterns and behaviour which correspond with growth spurts (Hill 1992). Giugliani et al. (1994) suggest a role for fathers in the management of perceived breast milk insufficiency. They propose that a better understanding about such issues as feeding behaviour of normal children and breast-feeding physiology, would help fathers become more supportive when mothers feel tired and insecure about the adequacy of their milk or during a 'transient lactational crisis'.

In this study most women (69.8%) claimed to have stopped breast-feeding on their own initiative. This finding is consistent with other studies which report that the decision to terminate breast-feeding is frequently made without health professional advice (Loughlin et al. 1985).

8.4 Support for breast-feeding

8.4.1 Peri-natal support for breast-feeding

It would be unfair to say that mothers are not supported in their efforts to breast-feed. Most hospitals have now introduced, or attempt to provide, routines which promote and encourage breast-feeding such as early infant-to-breast contact, rooming-in, demand feeding, along with policies which control the use of supplemental feeding. While the value of such practices should not be underestimated, mothers have indicated a need for more practical breast-feeding assistance (Saunders and Carroll 1988).

This finding was supported by comments made by women in the Perth focus groups. They indicated that while hospital mid-wives, and nursing staff in general, were helpful and supportive of their efforts, they often felt they were too busy to give them the degree of individual support and encouragement that they needed. Furthermore, while 'routine' nursing care is available to mothers, they often don't know what questions to ask or else are hesitant to 'bother' nursing staff (Hall 1978). With the advent and increased popularity of

early discharge programs even the most highly motivated and helpful hospital-based staff are not in a position to provide meaningful support.

While peri-natal support is critical for the initiation of breast-feeding, it would appear that post-natal support during the first two to six weeks postpartum is an important ingredient for establishing and maintaining breast-feeding. Traditionally, this type of post-natal support was provided by a *doula*. While many Australian women receive help from their partner or mother in the first few weeks postpartum, this is usually assistance with household chores or child care. However, as many women's mothers did not breast-feed, they are not in a position to provide the practical support and guidance needed to establish and maintain successful breast-feeding.

This type of support and guidance is available in the community through the Nursing Mothers' Association of Australia (NMAA). While the NMAA has been largely credited with reversing the decline in breast-feeding experienced in the 1950s and 1960s (Hartmann et al. 1982; Smibert 1988), it would appear that the group most likely to need their assistance, that is socially disadvantaged women, are the least likely to use this service. In fact, only 6 of the 385 women (1.6%) who had experienced breast-feeding problems at any time indicated that they had approached the NMAA for assistance. Focus group discussions with women from low socio-economic backgrounds suggest that, while they are aware of the services of the NMAA, they regard their counsellors as being somewhat aggressive and 'alternative' (recommending prolonged breast-feeding for 12 months or longer) in their approach. The negative response of mothers in the focus groups to the picture of a toddler being breast-fed suggests that this group in general does not find prolonged breast-feeding acceptable, adding to their non-acceptance of the NMAA.

A similar situation has been reported for the USA by Rassin et al. (1984) in a study of low income women. They found that only 14% of mothers in their

study had participated in any kind of childbirth education or La Leche League group. They contend that despite the increase in the number of La Leche groups, which was an indicator of the increased incidence of breast-feeding, these programs were directed primarily at middle-class Anglo-Americans and did not tackle the educational problems of black Americans and less well-educated women.

These findings suggest that breast-feeding support groups need to look at who they are serving and to investigate ways in which they can best meet the needs of socio-economically disadvantaged women. Those women who currently need their services the most but who do not avail themselves of these same services.

8.4.2 Post-natal support interventions

According to Jones and West (1986), "inadequate assistance for mothers wishing to breast-feed has contributed to the unacceptably high rate of premature cessation of breast-feeding and consequently to disappointment of mothers". Although many investigators have recommended hospital support after discharge, relatively few reported studies have determined the effect of post-natal support on breast-feeding patterns.

A study involving 80 breast-feeding, low-income women in the USA suggests that repeated post-partum breast-feeding support increases the duration of breast-feeding (Saunders and Carroll 1988). The intervention group, which received peri-natal hospital support as well as a follow-up phone call and a structured group support class at 2-weeks post-partum, had a consistent and statistical 20% to 25% increase in breast-feeding duration in comparison with the control group.

A similar study of Welsh women resulted in significantly more intervention group mothers than controls breast-feeding at four weeks (Jones and West 1986). Differences were consistent at each point in time up to six months.

The beneficial effect was greatest among women from the lower social classes and among those previously unsuccessful at breast-feeding.

Grossman et al. (1990) found that intensive post-partum lactation counselling had no effect on the duration of breast-feeding amongst low-income women. However, this study was conducted in the one hospital and the authors acknowledge that there may have been some degree of contamination or Hawthorne effect in operation. It appears that the presence of the lactation consultant on the ward may have stimulated the regular staff's interest in breast-feeding promotion. The authors reported that before the onset of the study, a brief retrospective survey of women delivering at the hospital, revealed that 50% of these women had weaned by six weeks. In the larger prospective study, the program's intervention decreased the rate of early weaning from 50% to 30%, a statistically significant difference.

Serafino-Cross and Donovan (1992) found a significant difference in the duration of breast-feeding between women receiving a breast-feeding intervention program and the comparison group. Both groups received the standard in-hospital breast-feeding instruction, while the women in the intervention group received, in addition, an average of seven home breast-feeding support contacts by the researcher over two months post-partum, and were provided with the researcher's phone number. More than half (61.5%) of the intervention group were breast-feeding at two months post-partum versus just over one third (34.6%) of the comparison group ($p< 0.01$).

Redman et al. (1995) recently evaluated an intensive breast-feeding program amongst new mothers in Newcastle, Australia. Women were randomly assigned to either the control group, which received the standard care or the experimental group which received the intensive program designed to increase the proportion of primiparous mothers who breast-fed for four months or longer. The program consisted of written materials, and antenatal and postnatal groups and individual sessions with a lactation consultant. It

also included a visit from a breast-feeding consultant while in hospital after the birth and contact on return home. The breast-feeding consultant was always available to answer question about breast-feeding. Women were followed up six weeks and four months after delivery. At the completion of the trial the intensive intervention program failed to improve breast-feeding rates at either the 6-week or 4-month follow-up. The authors concluded that programs designed to increase breast-feeding will need to address underlying factors such as hospital policy rather than simply providing more health education.

In general, while findings of intensive post-natal interventions suggest a positive beneficial effect, given the intensity and likely costs of the interventions, the results are often disappointing. Furthermore, many of the interventions are conducted by the researchers who have a strong commitment to breast-feeding and a successful outcome. It may be difficult to replicate the success of these programs when incorporation of these intensive strategies into routine hospital care is attempted unless specific staff are allocated to the task and are trained and personally committed to the task.

8.4.3 Community interventions to promote the social acceptance of breast-feeding

Most strategies to promote breast-feeding have focused on education of both mothers and health professionals and identification and modification of hospital and clinic practices that discourage or inhibit breast-feeding. Relatively few have trialed interventions which promote the social acceptance of breast-feeding or tackle unsupportive public policy with legislative changes.

In recent years in the United States several states have enacted breast-feeding legislation with many states clearly identifying that a woman has a right to breast-feed any place that she has the right to be (Baldwin, 1997 http://www.lalecheleague.org/LawBF.html). The state of New York protects

the right to breast-feed in public as a mother's civil right and provides mothers with legal recourse if they are prevented from breast-feeding. While it is currently not illegal to breast-feed in public the legislation is being enacted because it is the public perception that breast-feeding is indecent exposure.

While protection of a woman's right to breast-feed in public through legislation is to be applauded, the need in the first place for such legislation must be questioned. That such a natural act as breast-feeding should be viewed as being indecent clearly illustrates the trouble that many Western societies have in separating the physiological function of the breasts from the sexual role. As Ellis (1981) contends "it seems more acceptable in today's society to expose breasts by means of décolletage or transparent clothing for erotic purposes than to expose them for breast-feeding".

Barber-Madden (1990) describes a multi-tiered program implemented in New York City which in addition to addressing educational needs and hospital policies targeted public policy and legislation and supportive worksite practices. It also incorporated a mass media public information campaign which consisted of a subway poster campaign, television and radio public service announcements and press coverage. A breast-feeding information line provided individual support, information and referrals to interested callers with an information leaflet being sent to all callers. During the period of the campaign a significant increase in breast-feeding rates amongst low-income and ethnic patients of the municipal hospital system was reported. While acknowledging that the increases may not have been attributable solely to the program, the strategies do demonstrate successful models for breast-feeding promotion in large urban areas.

A community development approach was utilised by a community in Ontario, Canada to increase breast-feeding initiation and duration rates. In addition to development of a series of information leaflets which were promoted by a

mass media launch, the group addressed policy development and environmental support. They also investigated the availability of public facilities for breast-feeding in the region's retail mall (Valaitis and Shea 1993).

In Canada, the City of Toronto has enacted a policy enabling mothers to breast-feed in city owned and leased premises (City of Toronto Public Health, 1997 http://www.city.toronto.on.ca.ca/6SER/brstfd.htm). The policy ensures that a room is available at all city facilities for female employees of the city and nursing mothers in the community.

In Australia a 'Breast-feeding Friendly Restaurant' project was recently launched in the Blue Mountains of NSW (Patterson et al. 1996). Local eating establishments which welcome breast-feeding mothers were identified and a list compiled. These establishments were provided with a specially designed sticker to be prominently displayed on their door or window as an indication of their support for breast-feeding.

8.4.4 A multi-strategy approach to prmoting and supportin breast-feeding

These programs identify a range of strategies and approaches that can be used to promote and support breast-feeding, strategies that have been used successfully to radically shift public opinion, beliefs and behaviours concerning smoking.

Stickney and Webb (1996) conducted an extensive review of the literature which assessed the effectiveness of initiatives aimed at promoting breast-feeding and developed a list of 13 options for promoting breast-feeding. These included:

1. Education (e.g., of mothers, school children, fathers, pregnant women, etc, via curricula, antenatal classes etc.);

2. Assessment and support of breast-feeding mothers (e.g., Nursing Mothers Association of Australia, local schemes, early discharge programs);
3. State, national and international policy;
4. Hospital policies and practices;
5. Health professional policies and practices;
6. Health professional training and attitudes;
7. Industry codes, policies and practices;
8. Workplace policies and facilities (e.g., child care, flexible schedules)
9. Community facilities including health and building regulations and policies;
10. Public campaigns (directed at attitude changes and research into public attitudes to breast-feeding);
11. Lobbying, sanctions, advocacy, consumer lobbying (e.g., boycotts, demonstrations, media advocacy);
12. Monitoring and surveillance of breast-feeding;
13. Applied research to support the design of interventions.

Ellis (1981) suggests that greater public awareness of the benefits of breast-feeding would be achieved if we tackled the problem in the same way and with the same assertion that the anti-smoking campaign has been approached by health professionals in recent decades. Many of the options proposed by Stickney and Webb (1996) have been used successfully in the anti-smoking campaign. Implementation of some or all of these options would help to protect the comparatively high rates of breast-feeding in Australia and promote the increased duration of breast-feeding amongst Australian women. However, in order for these strategies to succeed they need to be tailored to the needs of the community in which they are to be implemented and they need to be appropriately monitored and evaluated.

9 Conclusions and recommendations

On an international scale, breast-feeding interventions conducted in Australia to date, have been successful, in as much that the rapid decline in breast-feeding experienced in the 1950s and 1960s was halted and the number of women breast-feeding on discharge from hospital increased steadily throughout the 70s and into the mid-80s. However, since this time, the rate of breast-feeding has remained relatively constant with between 80 - 90% of women breast-feeding on discharge from hospital. It is unlikely that large-scale interventions aimed at 'selling' the benefits of breast-feeding will result in very many more women choosing to breast-feed. Awareness of the benefits of breast-feeding is relatively high, with most women recognising the nutritional, immunological, and possible psychological benefits of breast-feeding. However, such interventions should not be discontinued as declines in breast-feeding rates have been noted in both the US and UK, indicating a continued need for educational programs of this nature.

Breast-feeding initiation rates in Australia are relatively high and close to the National Goals and Targets recommendation of 90% of women breast-feeding on discharge from hospital (Nutbeam et al. 1993). However, rates of breast-feeding decline rapidly so that many women have ceased breast-feeding by three months. Although some drop in breast-feeding is expected after parturition, it is the rate that this occurs that is of concern. This decline is greatest and most rapid among women from socio-economically disadvantaged backgrounds.

9.1 Recommendations - Opportunities and strategies to support and encourage breast-feeding

To date breast-feeding promotion interventions have focused on motivating mothers to breast-feed, with minimal attention being paid to strategies which

may actively prolong breast-feeding duration. Findings from this study and the literature suggest that the most likely way to achieve the National Goals and Targets for breast-feeding is to focus attention on those strategies which will:

1. Influence intended duration;
2. Influence the attitudes and beliefs of the mother's support network, particularly partners;
3. Shift the emphasis of antenatal and postnatal education from the nutritive and immunological benefits of breast-feeding to the day-to-day realities and practicalities of breast-feeding; and
4. Promote breast-feeding as the social norm.

9.2 Health service-based interventions

It is important that the limited resources used by the health authorities for promotion of breast-feeding are focused on the groups with the lowest prevalence of breast-feeding. Increases in breast-feeding will depend on increasing the initiation and duration of breast-feeding among those groups who currently show the lowest incidence of breast-feeding: mothers less than 20 years of age; mothers with less than 12 years of education, primiparous mothers and mothers with previously unsuccessful breast-feeding histories. However, the high levels of breast-feeding amongst other groups still need to be protected.

9.2.1 Hospital policies and procedures

The WHO/UNICEF Baby Friendly Hospital Initiative encourages the adoption of *Ten Steps to Successful Breast-feeding.* Under this initiative, each facility providing maternity services and care for newborns should:

1. Have a written breast-feeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.

3. Inform all pregnant women about the benefits and management of breast-feeding.
4. Help mothers initiate breast-feeding within a half-hour of birth.
5. Show mothers how to breast-feed, 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 breast-feeding on demand.
9. Give no artificial teats or pacifiers to breast-feeding infants.
10. Foster the establishment of breast-feeding support groups and refer mothers to them on discharge from the hospital or clinic.

Despite the professional attention that breast-feeding has received over the past few decades it would appear that a substantial proportion of women in Australia are still not receiving care consistent with the WHO/UNICEF recommendations regarding maternity services.

While many maternity hospitals practice and promote many of these ten steps, to date, few Australian hospitals have been officially accredited as a WHO Baby Friendly Hospital. All hospitals providing maternity services should be encouraged to seek accreditation as a WHO Baby Friendly Hospital. At the very least, all hospitals with maternity wards should have a written breast-feeding policy which promotes and encourages early infant-to-breast contact, 'rooming-in', breast-feeding on demand and the with-holding of supplementary feeds, unless medically indicated.

In particular, frequent and unrestricted breast-feeding should be encouraged in hospital. Unrestricted breast-feeding has been shown to be associated with increased breast-feeding duration and to increase early milk production and infant weight gain. These findings are of practical relevance as insufficient

milk production is perceived as the major cause of early lactation failure. A slow infant weight gain in the early post-partum period will contribute to a woman's uncertainty about her milk supply. On the other hand, a fast infant weight gain during the early lactation period will potentially increase a woman's confidence in her ability to breast-feed and reassure her of the adequacy of her milk supply.

9.2.2 Antenatal classes

It has been demonstrated that prenatal intent for length of breast-feeding is the strongest predictor of breast-feeding duration. That is, women set prenatal goals for breast-feeding duration and tend to fulfil these goals regardless of intervening events. As most women have made the decision to breast-feed prior to attending antenatal classes the focus of antenatal classes should be directed at modifying these prenatal goals to increase duration. As well as identifying those mothers who intend to breast-feed, prospective parents should be questioned as to the intended duration of breast-feeding.

Rather than simply selling the 'Breast is Best' message more time should be spent promoting six months as the minimum duration for breast-feeding. While full breast-feeding for this period of time is preferred, this should not be interpreted as an 'all or nothing' message. It should be recognised that full breast-feeding is not always possible, especially for mothers who return to work before they wish to cease breast-feeding. Any breast-feeding is better than no breast-feeding and mothers should be encouraged to combine breast feeding with formula feeding in situations where full breast-feeding is neither possible nor practical.

The results of this study and other recent research identify an important supportive role for fathers in the breast-feeding process. Fathers participate in and influence the choice of infant feeding method, and influence duration by acting as key supports or deterrents to breast-feeding by the mother. These findings highlight the need for including fathers in the discussions about

breast-feeding. The amount of time spent on discussing the nutritive and protective advantages of breast-feeding in antenatal classes needs to be expanded to allow time for explanation of the supportive roles families can play for the breast-feeding mother. Fathers may feel left out of the breast-feeding process or left out of the dyadic relationship which develops during breast-feeding. They may also feel that breast-feeding of the infant interferes with their sexual relationship and is therefore placing at risk the re-establishment of prior patterns of sex with their partner. Reinforcement of the value to breast-feeding mothers of practical help with indirectly associated activities (such as occupying other children and household chores) and emotional support during feeding should be given to both parents before and after the birth.

Women everywhere doubt the adequacy of their breast milk both in terms of quality and quantity. This doubt makes mothers particularly susceptible to the influence of family and friends who may suggest that the quantity and/or quality of the mother's milk may be deficient in some way. A better understanding about such issues as feeding behaviour of normal children and breast-feeding physiology, would help fathers become more supportive when mothers feel tired and insecure about the adequacy of their milk, or during a 'transient lactational crisis'.

Antenatal classes should address management issues and deal with the realities, as well as the advantages, of breast-feeding. Successful interventions involve anticipatory guidance, which is based on providing information before it is actually needed. In particular, this should include advice regarding breast milk insufficiency. A mid-wife in hospital is unlikely to see a mother with perceived breast milk insufficiency. However, s/he can help avoid maternal perceptions of an inadequate milk supply, as well as other common problems of nipple soreness and mastitis, by discussing management strategies. This instruction needs to come before and after the delivery.

9.2.3 'Booking-in' interview

At the time of the 'booking-in' interview women should be asked their preferred method of infant feeding. At this time the opportunity should be taken to encourage breast-feeding amongst those women who remain undecided or ambivalent about how they will feed their newborn. A woman who has elected not to breast-feed might be asked if she ever considered breast-feeding and why she has chosen not to breast-feed. It is possible that a little support and reassurance may help change her mind and influence her to try breast-feeding.

As 'intended duration' is a strong predictor of actual duration, the booking-in interview presents an opportunity to identify the intended duration of those women who plan to breast-feed. Simply asking a woman how long she intends to breast-feed is a reliable way of identifying those at risk of breast-feeding for less than six months. The reasons behind the current recommendation of a minimum duration of four to six months could be discussed at this point, with the aim of increasing intended duration amongst those women who plan to breast-feed for less than six months.

9.2.4 Training of health professionals

There is evidence to suggest that education of medical and nursing staff can improve breast-feeding rates. All staff working on maternity wards should receive in-service training and regular up-dates on breast-feeding management. Provision should be made for at least one staff member in each hospital with a maternity ward to be trained as an accredited Lactation Consultant. This training should be offered not only to nursing staff, but other staff members, for example dietitians and medical staff, should be encouraged to undertake this program. This would include support in the form of leave and financial assistance to attend the training workshops that are conducted in major metropolitan centres.

Training in breast-feeding and resources should also be provided for community-based health professionals such as child health nurses, general practitioners and community pharmacists. It is rare for a woman to have successfully established breast-feeding prior to discharge and it may take up to six weeks before breast-feeding is fully established. It is important that the health professionals with whom breast-feeding mothers come into contact during this vulnerable stage, and later, are adequately trained to support and promote breast-feeding.

9.2.5 Post-natal home support program

Funding should be provided to trial a variety of post-natal home support programs. At present women are generally discharged from hospital with the advice to contact either the Child Health Sister or the Nursing Mothers Association if they experience problems with breast-feeding. A more proactive approach whereby women are contacted by phone at 2 and 7 days after discharge and again at 3 and 6 weeks post-partum by a trained Lactation Consultant should be trailed. Programs should be evaluated both in terms of their impact on breast-feeding rates as well as the ability of hospitals and/or Maternal and Child Care staff to incorporate them into routine antenatal and postnatal care. Such a pro-active approach which provides anticipatory and consistent advice before problems occur has been proven to be effective in prolonging breast-feeding duration, particularly amongst low-income hard-to-reach groups.

One predictor of early cessation of breast-feeding is a previous unsuccessful or problematic breast-feeding experience. As women tend to repeat with later children the breast-feeding decision they made with the first child, efforts to increase breast-feeding should focus on primiparous mothers, and multiparous women who failed to breast-feed for the recommended 6 months. Efforts to support primiparous mothers who breast-feed by providing reassurance and advice can not only increase the likelihood that they will

continue to breast-feed their first born, but can also increase the likelihood of them breast-feeding subsequent children.

9.3 Community-based interventions

Breast-feeding interventions should continue to promote the biological advantages of breast-feeding but strategies which promote breast-feeding as socially desirable, and breast-feeding in public as socially acceptable, should also be explored. In particular, health professionals should look for ways of adapting and applying strategies that have been successfully used in the anti-smoking campaign. In the same way that the anti-smoking campaign has successfully reversed public acceptance of smoking, the general public's perception of public breast-feeding as being socially unacceptable could be reversed.

9.3.1 Schools

In most cases the decision to breast- or bottle-feed is made either prior to conception or early in pregnancy. Often this occurs well before a planned antenatal visit. This suggests that educational efforts to increase breast-feeding rates need to reach prospective parents early. Breast-feeding is an appropriate topic for inclusion in high school health curriculum to ensure that both future mothers and fathers are reached.

Adolescent girls and boys, while recognising the benefits and importance of breast-feeding, often experience embarrassment and awkwardness when witnessing a woman breast-feed. They are often inclined to think that a woman should isolate herself rather than breast-feed in public. This attitude if carried into adult years may result in the early discontinuation of breast-feeding. Classes therefore need to cover the sexual and social aspects of breast-feeding as well as the nutritive and protective roles. Discussions about breast-feeding and breast-feeding demonstrations should be incorporated into health education, home economics and life skills curricula. Lessons could be

presented by the School Health Nurse in conjunction with a breast-feeding demonstration by a member of the local branch of the NMAA.

9.3.2 Community-based breast-feeding support groups

Currently the services of breast-feeding support groups such as the NMAA are infrequently used by women from socio-economically disadvantaged background. Focus group discussions revealed that these women perceive NMAA counsellors to be somewhat aggressive and alternative - promoting prolonged infant feeding. The NMAA should conduct further qualitative research among socio-economically disadvantaged women to identify barriers which prevent these women from utilising the services of the NMAA. They should identify the needs of these women and ways of encouraging women to utilise their services.

9.3.3 Breast-feeding policies

All major Commonwealth, State and Local Government offices (e.g. Social Security, Commonwealth Employment Services) and transport boards should have a written breast-feeding policy which acknowledges and supports the right of mothers to breast-feed in public. All staff should be informed of the existence and content of these written policy statements.

Local Government should take into consideration the needs of breast-feeding women when approving building plans for major public venues, such as shopping centres and leisure facilities, and require (or at least advocate for) the inclusion of nursing rooms, where mothers can breast-feed in private should they wish. These rooms may be adjacent to, but should be separate from the female toilets.

9.3.4 Baby friendly restaurants/cafe project

Local Health Authorities, in conjunction with the local branch of the NMAA could initiate a 'Baby Friendly Restaurant/Cafe project. Local eating establishments which support breast-feeding by providing pleasant and hygienic nursing rooms and/or welcome mothers who breast-feed in public should be recruited into the program. They could advertise their support for breast-feeding by clearly displaying a specially designed 'Baby Friendly Restaurant' sticker on their door. A list of 'Baby Friendly Restaurants' could be compiled and distributed to new mothers by the Child Health Nurse and through local pharmacies.

9.3.5 Media promotion

Local Health Authorities should look for opportunities to utilise the local media to promote breast-feeding. Potential news items include the launch of interventions such as the Baby Friendly Restaurant project or a local Council's Breast-feeding Policy. Regular human interest stories should be encouraged, for example a story which identifies a local breast-feeding couple, highlighting the supportive role of the father and the importance of his contribution to successful breast-feeding.

In recent years many health messages have been successfully disseminated to the public through the medium of television. Health promotion professionals should work with this medium to present breast-feeding in public in a favourable light. For instance 'soap opera' script writers should be encouraged to show, or at least allude to, infants being breast-fed, rather than showing infants being bottle-fed as is currently the norm.

A national media campaign funded by the Commonwealth Department of Health and Human Services and State Health Departments, which promotes breast-feeding in public as socially acceptable and socially desirable, should be conducted. Such a campaign could consist of a series of short television

advertisements which show women breast-feeding in a number of situations, for instance on a bus, in a restaurant or a busy shopping mall. The television advertisements could be supported by a series of posters based on the advertisements which could appear as back of bus advertisements or displayed in health centres, pharmacies and various government agencies.

9.4 Research into breast-feeding

While breast-feeding rates in Australia are higher than many other Western countries it is important that government and non-government agencies, health professionals and the general public do not become complacent about breast-feeding. It is essential that breast-feeding rates are regularly monitored to assess whether initiation and duration rates are improving in line with recommended target levels. In particular, breast-feeding rates amongst groups known to have a lower incidence and duration of breast-feeding (e.g. urban aboriginal women, migrant groups and other socio-economically disadvantaged women) should be monitored and evaluated at regular intervals.

There should be continuing research and surveillance of hospital practices to ensure that there is adequate funding and support for breast-feeding initiatives in the face of continuing economic pressures on the health care sector. Funding should be provided for intervention studies designed to improve breast-feeding rates amongst high risk groups. For instance, a health promotion program directed at fathers should be implemented and evaluated to determine whether education of fathers improves initiation and duration rates. Finally, further research should be conducted to investigate the specific effects of smoking and return to employment on breast-feeding duration rates.

9.5 Conclusion

The first Australian Dietary Guideline for Children is 'Promote and support breast-feeding'. Successful breast-feeding depends on many factors. The improvement of breast-feeding initiation rates and the prolongation of mean breast-feeding duration likewise depends on many factors. The suggestions outlined above, if implemented, would contribute to improved breast-feeding rates in Australia and help achieve the National Goals and Targets for breast-feeding.

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Appendix 1

Baseline Questionnaire

curtin
University of Technology
Perth Western Australia

School of Public Health

An Evaluation of

Infant Feeding Practices

The School of Public Health at Curtin University is studying how Perth babies are fed. As part of this project, mothers of newborn babies in several hospitals in Perth are being asked about their experiences and opinions.

We are asking for some of your time to complete the attached questionnaire. Your answers will remain **strictly confidential** because you do **not** have to write your name on the questionnaire and staff at the hospital will not see your answers.

When you have completed the questionnaire, please put it in the attached envelope. If you cannot hand in the questionnaire while at hospital, please post it back to us in the envelope.

For each question please **circle** the number beside the answer of your choice **or** fill in the blank.

For most questions only circle one answer;

examples What colour is your hair?
Brown.....1
Red.....2
Blonde.....3
Grey.....4
I'm not sure.....5

For some questions circle yes or no;

example	Do you like the following foods	Yes	No
	Cheese	1	2
	Tomatoes	1	2
	Chocolate	1	2

For some questions circle any answer that applies.
(These questions are preceeded by instructions).

example Which of the following would you like to see?

Niagra Falls 1
Grand Canyon 1
Ayers Rock 1
Victoria Falls 1

SECTION 1.

office use only

1 2 3

Record 1

4

In this section we are interested in finding out about how you are feeding your new baby.

1a) How are you feeding your baby?

bottle-feeding infant formula or milk 1
breast-feeding only 2
mainly bottle-feeding (formula) but also breast-feeding 3
mainly breast-feeding but 'topping up' with bottle-feeding (formula) ... 4
other (please specify) _____ ☐

(5)

1b) If you are giving your baby any bottle-feeds, how many bottles did your baby have yesterday (24 hours)? ☐☐

6 7

2a) If you are only bottle-feeding, did you try to breast-feed your baby?

No...(Go to question 3) 1
Yes 2

(8)

2b) Why did you change to bottle-feeding? ☐

9

☐

10

3. When did you **first** decide how you were going to feed your new baby?

before I became pregnant 1
early in my pregnancy 2
late in my pregnancy 3
during labour 4
after my baby was born 5

(11)

4. Who helped you decide whether you would bottle-feed or breast-feed?
(Please circle **any answers** that apply) (You can have more than one answer)

No one 1
The baby's father 1
My mother 1
Other relatives 1
Friends 1
My doctor 1
Other health professionals e.g., nurse, dietitian 1

(12)

(18)

Other (please specify) _____

☐

19

5. If you decided to bottle-feed your baby from the start, what were the reasons for this choice?
(Please circle **any answers** that apply) (You can have more than one answer)

formula is better for the baby 1
bottle-feeding is easier 1
I don't like breast-feeding 1
I will go back to work soon after the birth 1
breast-feeding will make my breasts sag 1
the baby's father prefers bottle-feeding 1
formula is just as good as breast-milk 1
the baby's father can help with bottle-feeding 1
I want to know much milk baby has at each feed 1
my mother suggested bottle-feeding 1
friend or relative suggested bottle-feeding 1
health worker (e.g , doctor, nurse) suggested bottle-feeding 1
I am breast-feeding 1

(20)

(32)

other (please specify) _____

☐ 33

☐ 34

6a) Did any member of the hospital staff encourage you to put your baby to the breast right after the birth?

Yes 1
No...(Go to question 7)..... 2 (35)

6b) Who encouraged you to put your baby to the breast right after the birth?

(Please circle **any answers** that apply) (You can have more than one answer)

doctor 1 (36)
midwife 1
nurse 1 (38)
other (please specify)_____ ☐ 39

7. How much of the time have you kept your baby with you in your room?

all during the day and all of the night...(Go to question 9) 1
all during the day and part of the night 2 (40)
all during the day but not overnight 3
part of the day but not all of the day 4
(specify how many hours) _____ ☐☐ 41 42
baby has been in the Special Care Nursery all of the time 5

8. Would you have liked to have had your baby with you overnight?

No 1
Yes, some nights 2
Yes, every night 3 (43)
Don't know 4

9. Have you shared your hospital room with other mothers?

No 1
Yes, one other mother ..... 2 Yes,
two other mothers 3 ..... (44)
Yes, three other mothers 4

10. What type of room have you had in hospital?

Multi-bed 1
Single/private 2 (45)

11. If your baby is in the nursery at night, what do the nursery staff **mainly** do when the baby gets hungry?

they bring the baby to me to feed 1
the nurse lets me know and I go to the nursery to feed baby 2
they give baby a bottle of formula 3
they give baby a bottle of my expressed breast milk 4 (46)
they give baby a bottle of glucose water 5
they give baby a bottle of plain water 6
I don't know 7

12. How often are you feeding your baby?

On demand ie. whenever baby wants to be fed
(e.g., cries out in hunger) 1
By the clock - about every 2 hours 2
By the clock - about every 3 hours 3 (47)
By the clock - about every 4 hours 4
Other (please explain) _____ ☐

13. About how long does your baby spend at the breast for a feed?

baby is bottle-feeding 1
less than 15 minutes 2
15 minutes to half an hour 3 (48)
half an hour to an hour 4
over an hour 5
other (please specify)_____ ☐

14. About how many times per day do you feed your baby? (in a 24 hour period)

_____ ☐☐ 49 50

15. Have you been encouraged by hospital staff to "demand feed"? (Demand feeding is whenever the baby wants to feed)?

Yes 1
No 2 (51)

16a) Have you been satisfied with the hospital's rules about how often you should feed your baby?

Yes...(Go to question 17) 1
No 2 (52)

16b) Please explain what you don't like about these rules.

_____ 53
_____ 54
_____

17a) In general, do you think you have had enough help and information about feeding your baby from hospital staff?

Yes...(Go to question 18) 1
No 2 (55)

17b) What kind of help or information would you have liked? (Please specify)

_____ 56
_____ 57
_____

18a) Hospital staff members sometimes have conflicting ideas and opinions about infant feeding. Do you feel you have been given conflicting advice by different members of this hospital staff about feeding your baby?

Yes 1
No...(Go to question 19) 2 (58)

18b) If yes, please explain

_____ 59
_____ 60
_____
_____

19. Since you have been in hospital have you received any of the fdlowing from hospital staff?
Please circle all that you have received (You can have more than one answer)

pamphlets on breast-feeding baby 1 (61)
lectures or classes on breast-feeding baby 1
demonstrations on how to breast-feed baby 1
video (TV) or slide show on how to breast-feed baby 1
individual consultation or discussion with any of the staff about breast-feeding baby 1
none of the above 1 (66)

other (please specify) _____ 68
_____
_____

20. Did your mother breast-feed any of her children?

Yes 1
No 2 (69)
Don't know 3

21. Does the baby's father have any preference for how you feed your baby?

Yes, he prefers bottle-feeding 1
Yes, he prefers breast-feeding 2
He doesn't mind how I feed my baby 3 (70)
Never really discussed the matter with him 4

22. Does your mother have any preference for how you feed your baby?

Yes, she prefers bottle-feeding 1
Yes, she prefers breast-feeding 2
She doesn't mind how I feed my baby 3 (71)
Never really discussed the matter with her 4

23. How have your friends fed their babies?

Most of them bottle-fed 1
Most of them breast-fed 2
Some breast-fed and some bottle-fed 3 (72)
Friends don't have babies 4

office use only

1 2 3

Record 2

4

24. Have you ever attended any antenatal classes, or lectures on how to feed your baby ?

- Yes, for this pregnancy 1
- Yes, for a previous pregnancy 2
- Yes, for this pregnancy and a previous pregnancy 3 (5)
- No 4

25. For the next few weeks, how do you think you will feed your baby?

- continue bottle-feeding 1
- continue breast-feeding 2
- continue to combine breast and bottle-feeding 3 (6)
- stop breast-feeding and start bottle-feeding 4
- stop bottle-feeding and start breast-feeding 5
- other (please specify) _____ ☐

26. When do you plan to first give your baby solids?

- before 2 months 1
- between 2 and 3 months 2
- between 4 and 6 months 3
- between 7 and 9 months 4 (7)
- between 10 and 12 months 5
- over 12 months 6
- Other (please specify) _____ ☐

27. How was your baby delivered?

- Vaginal without forceps or suction 1
- Vaginal with forceps or suction 2 (8)
- Caesarean (Go to question 29) 3

28a) Were you given any medications for pain during labour?

- Yes 1
- No...(Go to question 29) 2 (9)

28b) Which medications you were given?

- Gas 1 (10)
- Pethidine 1
- Epidural block 1 (12)
- Other (please specify) _____ ☐ 13

29. What was your baby's first feed?

- Formula 1
- Breast milk (or colostrum) 2
- Cow's milk 3 (14)
- Glucose water 4
- Plain water 5
- Other (please specify) _____ ☐

30a) Has your baby had any health problems, either since the birth or as a result of the birth?

- Yes 1
- No...(Go to question 31) 2 (15)

30b) What health problems has your baby had?

_____ ☐

_____

_____ ☐ 17

31a) Has your baby spent any time in a Special Care Nursery?

- Yes 1
- No...(Go to question 32) 2 (18)

31b) How long was your baby in this nursery?

baby is still in the nursery 1
less than one day 2
between 1 and 2 days 3
between 3 and 4 days 4 (19)
between 5 and 7 days 5
more than 7 days 6

32. Is this the first child you have given birth to?

Yes...(Go to question 34) 1
No 2 (20)

33. If not, please write how many weeks or months each child was breast-fed.
OR please write **bottle-fed** if bottle-fed from birth

Child	Weeks/months of breast-feeding	
_____	_____	21 22
_____	_____	23 24
_____	_____	25 26
_____	_____	27 28
_____	_____	29 30

SECTION 2.

The following questions are for mothers who are breast-feeding. If you are not breast-feeding at all, please go to Section 3, on page 16 which starts with question 50.

34. How long after the birth was it before you put your new baby to the breast?

immediately after birth, cord still attached 1
within 15 minutes 2
between 15 and 30 minutes 3
between 30 minutes and 1 hour 4 (31)
within a few hours 5
the next day 6
other (please specify) _____ ☐

35. How long was it before your milk came in?

within one day of the birth 1
the second day after the birth 2
the third day after the birth 3 (32)
still waiting for milk to come in 4
Other (please specify) _____ ☐

36. How much information about breast-feeding were you given by the hospital?

None or very little 1
Some, but I would have liked more 2
Enough 3 (33)
More than I wanted 4

37. Did any staff member check how your baby's mouth was attached to your breast when you first started feeding?

No 1
Yes 2 (34)

38. Did any staff member teach you how to position and attach your baby to the breast?

No 1
Yes 2 (35)
I didn't need to be taught 3

39. Why did you decide to breast-feed?

(Please circle **any answers** that apply) (You can have more than one answer)

the baby's father wanted me to breast-feed 1 (36)
breast milk is better for the baby 1
breast-feeding is the right thing to do 1
breast-feeding is cheaper 1
breast-fed babies are more intelligent 1
breast-feeding helps you lose weight 1
breast-feeding is fashionable 1
my mother advised me to breast-feed 1
breast-feeding helps prevent allergies 1
other people advised me to breast-feed 1
breast-feeding is more convenient 1 (46)

other (please specify)_____ ☐ 47

_____

40. Have you experienced any of the following since you started breast-feeding?

(Please circle **any answers** that apply) (You can have more than one answer)

inverted nipples 1 (48)
cracked or sore nipples 1
baby gets too much milk 1
baby gets milk too fast 1
takes a long time before milk starts flowing at start of feed 1
baby too tired to feed 1
difficulty expressing milk 1
baby not gaining enough weight 1
baby has problems sucking 1
breasts engorged (too full) 1
baby doesn't wake up for feeds 1
not enough milk or colostrum for baby 1
feeling that I'm not doing very well at breast-feeding 1 (60)

Other (Please specify) _____ ☐

_____ ☐ 62

_____

41. At what age do you plan to stop breast-feeding your baby?

before baby is 6 weeks old 1
between 6 weeks and 2 months 2
between 2 and 3 months 3
between 4 and 6 months 4
between 7 and 9 months 5 (63)
between 9 and 12 months 6
over 12 months 7

other (please specify)_____ ☐

42. Are you planning to start giving your baby formula-feeds?

Yes 1
No...(Go to question 44) 2 (64)

43. At what age do you plan to start giving your baby formula-feeds?

- before baby is 6 weeks old 1
- between 6 weeks and 2 months 2
- between 2 and 3 months 3
- between 4 and 6 months 4
- between 7 and 9 months 5
- between 9 and 12 months 6
- over 12 months 7
- other (please specify)_____ ☐

(65)

44a) Has any member of the hospital staff given you the name of anyone to contact if you have problems with breast-feeding after you leave hospital?

- Yes 1
- No...(Go to question 45) 2

(66)

44b) If yes, who were you told to contact?

(Please circle **any answers** that apply) (You can have more than one answer)

- Doctor 1 (67)
- Clinic sister/Community Health Nurse 1
- Lactation consultant 1
- Nursing Mother's Association 1
- Dietitian 1
- Hospital midwife 1 (72)
- Other, (please specify)_____ ☐
- _____ ☐
- _____ 74

office use only ☐☐☐ 1 2 3

For the following questions, there are no right or wrong answers.

Please circle the response that you first think of.

For example, in question 45, if you feel very confident in breast-feeding, circle 5, if you don't feel confident, circle 1. If you fall somewhere in-between please circle the appropriate number between 1 and 5.

If it is too early to tell, please circle 9.

Record ☐ 4

45. How would you rate your confidence in breast-feeding?

not confident				very confident	too early to tell	
1	2	3	4	5	9	☐ 5

46. How enjoyable do you find breast-feeding?

not enjoyable				very enjoyable	too early to tell	
1	2	3	4	5	9	☐ 6

47. How satisfied are you with your breast-feeding experience?

not satisfied				very satisfied	too early to tell	
1	2	3	4	5	9	☐ 7

48. In general, how comfortable do you feel while breast-feeding in front of other people?

not comfortable				very comfortable	too early to tell	
1	2	3	4	5	9	☐ 8

49. Have any of the following people supported or encouraged you with breast-feeding?

(Please circle **any answers** that apply) (You can have more than one answer)

Your friends	1	(9)
The baby's father	1	
Other members of your family	1	
Your clinic sister	1	
Your doctor	1	
Nursing Mother's Association	1	
Your mother	1	
Your mother-in-law	1	(16)

Other, Please specify_____ ☐ 17

_____

_____ ☐ 18

_____

SECTION 3.

The following information about you will help us to analyse our data. We recognise that some of the questions are very personal. Please remember that they will remain strictly confidential.

50. What is your postcode? ☐☐☐☐ (19 - 22)

If you don't know the postcode, what suburb do you live in?

_____

51. What is your age? ☐☐ 23 24

_____

52. What is the highest level of education you have completed?

Left school before year 10	1	
Junior/Achievement certificate/Year 10 or equivalent	2	
TEE/TAE/Leaving (Year 12 or equivalent)	3	
Trade, diploma or TAFE course e.g., hairdressing, secretarial	4	(25)
Bachelor degree or higher	5	

Other (Please Specify) _____ ☐

_____

53. How many years of schooling have you completed? ☐☐ 26 27

_____

54. Were you employed outside the home or studying in the past 6 months?

Yes, full-time employed	1	
Yes, part-time employed	2	
Yes, full-time student	3	(28)
Yes, part-time student	4	
No	5	

55. What is your occupation?

_____ □□ (29 30)

56. What do you plan to do in the next 6 months?

Will still be home with the baby 1
Work full-time 2
Work part-time 3
Study full-time 4
Study part-time 5
Undecided 6

(31)

57. What is your marital status?

Never married...(Go to question 59) 1
Now married 2
Defacto 3
Divorced or separated...(Go to question 59) 4
Widowed...(Go to question 59) 5

(32)

58. What is your partner's occupation?

_____ □□ (33 34)

59. In what country were you born?

_____ □□ (35 36)

60. In what country was your mother born?

_____ □□ (37 38)

61. Are you of Aboriginal or Torres Strait Islander descent?

Yes, Aboriginal descent 1
Yes, Torres Strait Islander descent 2
No 3

(39)

62. What type of health insurance do you have?

Public (Medicare) 1
Private 2

(40)

63. Approximately, what was your total family income for the past 12 months?

less than $ 10,000 1
$10,001 to $15,000 2
$ 15,001 to 25,000 3
$ 25,001 to 40,000 4
$40,001 to 50,000 5
more than $ 50,000 6

(41)

THANK YOU VERY MUCH FOR YOUR PARTICIPATION □

Appendix 2

Follow-up Questionnaire

NAME

Curtin University Infant Feeding Study

BABY'S NAME
PHONE NUMBER
Married / Defacto / Single
Other children
Address
Preferred time to call
Dates away

IDENTIFICATION CODE ☐☐☐

TERMINATION DATE ☐☐☐☐☐☐

	A	B	C	D	E	F	G
DATE interview due							
Date interview completed							
Dates/times tried							
Notes							
Age of baby							

	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
MAIN RECORD CODE							
IDENTIFICATION NUMBER	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)
RECORD NUMBER	(5)	(5)	(5)	(5)	(5)	(5)	(5)
BOTH	A	B	C	D	E	F	G
1. **How are you feeding your baby?**	(6)	(6)	(6)	(6)	(6)	(6)	(6)
breast-feeding only **(any bottles as well?)**	1	1	1	1	1	1	1
bottle-feeding only	2	2	2	2	2	2	2
combination of breast-feeding and bottle-feeding	3	3	3	3	3	3	3
	☐	☐	☐	☐	☐	☐	☐

Other responses

A _____

B _____

C _____

D _____

E _____

F _____

G _____

NOT FOR TERMINATION

(IF FEEDING METHOD HAS CHANGED)

2. Why did you change feeding methods?

A _____
B _____
C _____
D _____
E _____
F _____
G _____

A	B	C	D	E	F	G
☐☐ 7 8	☐☐ 7 8	☐☐ 7 8	☐☐ 7 8	☐☐ 7 8	☐☐ 7 8	☐☐ 7 8

NOT FOR TERMINATION

3. Did anyone help you decide to _____ (change in feeding practice)? If yes who?

	A	B	C	D	E	F	G
No one	1 9	1 9	1 9	1 9	1 9	1 9	1 9
The baby's father	1 10	1 10	1 10	1 10	1 10	1 10	1 10
My mother	1 11	1 11	1 11	1 11	1 11	1 11	1 11
Other relatives	1 12	1 12	1 12	1 12	1 12	1 12	1 12
Friends	1 13	1 13	1 13	1 13	1 13	1 13	1 13
My doctor	1 14	1 14	1 14	1 14	1 14	1 14	1 14
Clinic sister	1 15	1 15	1 15	1 15	1 15	1 15	1 15
Other health professionals e.g , nurse, dietitian	1 16	1 16	1 16	1 16	1 16	1 16	1 16
	A ☐☐ 17 18	B ☐☐ 17 18	C ☐☐ 17 18	D ☐☐ 17 18	E ☐☐ 17 18	F ☐☐ 17 18	G ☐☐ 17 18

Other responses

A _____
B _____
C _____
D _____
E _____
F _____
G _____

BOTH	A	B	C	D	E	F	G
4. **Are you feeding by the clock or by demand?** **(Read out answers)**	(19)	(19)	(19)	(19)	(19)	(19)	(19)
Demand	1	1	1	1	1	1	1
Clock - ~ 2 hours	2	2	2	2	2	2	2
Clock - ~ 3 hours	3	3	3	3	3	3	3
Clock - ~ 4 hours	4	4	4	4	4	4	4
BOTH	**A**	**B**	**C**	**D**	**E**	**F**	**G**
5. **How many times per day on average do you feed your baby (24 hours)** [If given range, average to one decimal place (0 or 5)]	□.□ 20 21	□.□ 20 21	□.□ 20 21	□.□ 20 21	□.□ 20 21	□.□ 20 21	□.□ 20 21
BOTH							
6. **How many times, on average would your baby feed between the hours of 10.00pm and 6.00 am?** [If given range, average to one decimal place (0 or 5)]	□.□ 22 23	□.□ 22 23	□.□ 22 23	□.□ 22 23	□.□ 22 23	□.□ 22 23	□.□ 22 23
BOTH	**A** (24)	**B** (24)	**C** (24)	**D** (24)	**E** (24)	**F** (24)	**G** (24)
7. **What is the average length of each feed?**							
< 15 minutes	1	1	1	1	1	1	1
≥ 15 minutes but < 30 minutes	2	2	2	2	2	2	2
≥ 30 minutes but < 1 hour	3	3	3	3	3	3	3
≥ 1 hour	4	4	4	4	4	4	4
BOTH	**A**	**B**	**C**	**D**	**E**	**F**	**G**

8. **After you stop feeding, what is the average length of time before _____ wants another feed?**	(25)	(25)	(25)	(25)	(25)	(25)	(25)
< 30 minutes	1	1	1	1	1	1	1
≥ 30 minutes but < 1 hour	2	2	2	2	2	2	2
≥ 1 hour but < 2 hours	3	3	3	3	3	3	3
≥ 2 hours but < 3 hours	4	4	4	4	4	4	4
≥ 3 hours but < 4 hours	5	5	5	5	5	5	5
≥ 4 hours	6	6	6	6	6	6	6
NOT FOR TERMINATION							
9. **If you are giving your baby any bottle-feeds, how many bottles did your baby have yesterday (24 hours)?** [If given range, average to one decimal place (0 or 5)]	□.□ 26 27	□.□ 26 27	□.□ 26 27	□.□ 26 27	□.□ 26 27	□.□ 26 27	□.□ 26 27
NOT FOR TERMINATION	**A**	**B**	**C**	**D**	**E**	**F**	**G**
(If giving bottle-feeds)							
10. **At what times do you usually give your baby bottle-feeds?**	(28)	(28)	(28)	(28)	(28)	(28)	(28)
no particular time	1	1	1	1	1	1	1
mainly during the day	2	2	2	2	2	2	2
mainly during the night	3	3	3	3	3	3	3
late afternoon (around dinner time)	4	4	4	4	4	4	4

BOTH	A	B	C	D	E	F	G
(Not asked again if woman answers yes at any stage) 11. **Have you expressed your milk since we last spoke (or since you left hospital)?**	(29)	(29)	(29)	(29)	(29)	(29)	(29)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH	A	B	C	D	E	F	G
12. **Why did you express your milk?**							
Wanted extra breast-milk just in case	1 30	1 30	1 30	1 30	1 30	1 30	1 30
Feed to be given by someone else, (going to work)	1 31	1 31	1 31	1 31	1 31	1 31	1 31
Feed to be given by someone else, (baby-sitting)	1 32	1 32	1 32	1 32	1 32	1 32	1 32
Had too much milk/uncomfortable	1 33	1 33	1 33	1 33	1 33	1 33	1 33
Sore nipples / engorgement	1 34	1 34	1 34	1 34	1 34	1 34	1 34
Baby given tube feeds	1 35	1 35	1 35	1 35	1 35	1 35	1 35
Baby ill	1 36	1 36	1 36	1 36	1 36	1 36	1 36
Self ill	1 37	1 37	1 37	1 37	1 37	1 37	1 37
Other	1 38	1 38	1 38	1 38	1 38	1 38	1 38
	A ☐☐ 39 40	B ☐☐ 39 40	C ☐☐ 39 40	D ☐☐ 39 40	E ☐☐ 39 40	F ☐☐ 39 40	G ☐☐ 39 40

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH	A	B	C	D	E	F	G
13. **What method did you use to express your milk?**							
hand	1 41	1 41	1 41	1 41	1 41	1 41	1 41
manual pump	1 42	1 42	1 42	1 42	1 42	1 42	1 42
electric pump - single	1 43	1 43	1 43	1 43	1 43	1 43	1 43
electric pump - double	1 44	1 44	1 44	1 44	1 44	1 44	1 44
other	1 45	1 45	1 45	1 45	1 45	1 45	1 45

BOTH	A	B	C	D	E	F	G
14. **Did you have any difficulties expressing your milk**	(46)	(46)	(46)	(46)	(46)	(46)	(46)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH	A	B	C	D	E	F	G
15. **(If difficulties What difficulties - expressing milk**							
Took too long	1 47	1 47	1 47	1 47	1 47	1 47	1 47
Was painful	1 48	1 48	1 48	1 48	1 48	1 48	1 48
Couldn't get very much/enough milk	1 49	1 49	1 49	1 49	1 49	1 49	1 49
	A ☐☐ 50 51	B ☐☐ 50 51	C ☐☐ 50 51	D ☐☐ 50 51	E ☐☐ 50 51	F ☐☐ 50 51	G ☐☐ 50 51

Other difficulties experienced (expressing milk)

A _____ E _____

B _____ F _____

C _____ G _____

D _____

NOT FOR TERMINATION

16. Have you had any difficulties with breast-feeding since I spoke to you last (or you left hospital) so things like;	A	B	C	D	E	F	G
- problems with your breasts?	(52)	(52)	(52)	(52)	(52)	(52)	(52)
- or problems with the baby feeding?							
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

NOT FOR TERMINATION

17. What difficulties experienced (unprompted, but probe for more than one answer?)	A	B	C	D	E	F	G
Problems with breasts							
cracked or sore nipples	1 53	1 53	1 53	1 53	1 53	1 53	1 53
breasts engorged (too full)	1 54	1 54	1 54	1 54	1 54	1 54	1 54
mastitis or breast infection	1 55	1 55	1 55	1 55	1 55	1 55	1 55
inverted nipples	1 56	1 56	1 56	1 56	1 56	1 56	1 56
breast-feeding is painful	1 57	1 57	1 57	1 57	1 57	1 57	1 57
Problems with baby feeding							
baby not gaining enough weight	1 58	1 58	1 58	1 58	1 58	1 58	1 58
baby has difficulties sucking	1 59	1 59	1 59	1 59	1 59	1 59	1 59
baby gets too much milk or too fast	1 60	1 60	1 60	1 60	1 60	1 60	1 60
poor " let-down"	1 61	1 61	1 61	1 61	1 61	1 61	1 61
baby refuses to breast-feed	1 62	1 62	1 62	1 62	1 62	1 62	1 62
baby too tired to feed i.e falls asleep at breast	1 63	1 63	1 63	1 63	1 63	1 63	1 63
feeling that I'm not doing very well at breast feeding	1 64	1 64	1 64	1 64	1 64	1 64	1 64
not enough milk for baby	1 65	1 65	1 65	1 65	1 65	1 65	1 65
Any others?							

Other breast-feeding problems	A	B	C	D	E	F	G
	☐☐ 66 67	☐☐ 66 67	☐☐ 66 67	☐☐ 66 67	☐☐ 66 67	☐☐ 66 67	☐☐ 66 67

A _____
B _____
C _____
D _____
E _____
F _____
G _____

NOT FOR TERMINATION	A
18. Did you expect to have difficulties with breast-feeding?	(68)
Yes	1
No	2

MAIN RECORD CODE	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
IDENTIFICATION NUMBER	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)	(2 3 4)
RECORD NUMBER	2 (5)	2 (5)	2 (5)	2 (5)	2 (5)	2 (5)	2 (5)

NOT FOR TERMINATION 19. **Have you asked for advice or help from anyone about your breast-feeding problem(s) ?**	A	B	C	D	E	F	G
If yes, who?							
No	1 6	1 6	1 6	1 6	1 6	1 6	1 6
Yes, doctor	1 7	1 7	1 7	1 7	1 7	1 7	1 7
Yes, child health nurse	1 8	1 8	1 8	1 8	1 8	1 8	1 8
Yes, hospital midwife	1 9	1 9	1 9	1 9	1 9	1 9	1 9
yes, friend/s	1 10	1 10	1 10	1 10	1 10	1 10	1 10
yes, mother	1 11	1 11	1 11	1 11	1 11	1 11	1 11
yes,other family member	1 12	1 12	1 12	1 12	1 12	1 12	1 12
yes, NMA	1 13	1 13	1 13	1 13	1 13	1 13	1 13
	A (14 15)	B (14 15)	C (14 15)	D (14 15)	E (14 15)	F (14 15)	G (14 15)

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

NOT FOR TERMINATION	A	B
20. **If yes, did anyone check to see how your baby's mouth was attached to your breast ?**	(16)	(16)
No	1	1
Yes	2	2

NOT FOR TERMINATION	A	B
21. **Has the clinic sister (or anyone else) taught you how to position and attach your baby to the breast?**	(17)	(17)
No	1	1
Yes	2	2
I didn't need to be taught	3	3

BOTH Week 6 - only if had problems	A	B
22. **In general, do you feel you have had enough help and advice about feeding since you left hospital (or since we last spoke)?**	(18)	(18)
Yes - needed help and got it	1	1
No - needed help but not available	2	2
Haven't needed any help	3	3
23. **If not, what kind of help would you have liked?**	A (19 20)	B (19 20)

A _____

B _____

BOTH	A	B	C	D	E	F	G
24. **Have different people given you conflicting advice about feeding, since we last spoke (or since you left hospital)?**	(21)	(21)	(21)	(21)	(21)	(21)	(21)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

25. **If yes, please explain**	A	B	C	D	E	F	G
	☐☐ (22-23)	☐☐ (22-23)	☐☐ (22-23)	☐☐ (22-23)	☐☐ (22-23)	☐☐ (22-23)	☐☐ (22-23)

A _____

B _____

C _____

D _____

E _____

F _____

G _____

BOTH	A	B	C	D	E	F	G
26. Have you seen any **advertisements for infant formula** since we last spoke (or since you left hospital)?	(24)	(24)	(24)	(24)	(24)	(24)	(24)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH 27. If yes, **Where did you see the ad?**	A	B	C	D	E	F	G
	☐☐ (25-26)	☐☐ (25-26)	☐☐ (25-26)	☐☐ (25-26)	☐☐ (25-26)	☐☐ (25-26)	☐☐ (25-26)

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH 28. **(If formula has been introduced) What type of formula?** (Do not prompt, unless - 'I don't know')	A	B	C	D	E	F	G
SMA	01	01	01	01	01	01	01
S26	02	02	02	02	02	02	02
Lactogen	03	03	03	03	03	03	03
Enfamil	04	04	04	04	04	04	04
Nan	05	05	05	05	05	05	05
Isomil	06	06	06	06	06	06	06
Infasoy	07	07	07	07	07	07	07
Prosobee	08	08	08	08	08	08	08
Karotene	09	09	09	09	09	09	09
O-Lac	10	10	10	10	10	10	10
Enfalac normal iron	11	11	11	11	11	11	11
Enfalac reduced iron	12	12	12	12	12	12	12
Specialised infant formula / other	13	13	13	13	13	13	13
	(27 - 28)	(27 - 28)	(27 - 28)	(27 - 28)	(27 - 28)	(27 - 28)	(27 - 28)

BOTH 29. **Why did you choose this particular formula?**(Do **not prompt** but **probe** for more than one answer)	A	B	C	D	E	F	G
Recommended by hospital staff	1 29	1 29	1 29	1 29	1 29	1 29	1 29
Recommended by Child Nurse	1 30	1 30	1 30	1 30	1 30	1 30	1 30
Recommended by Friend	1 31	1 31	1 31	1 31	1 31	1 31	1 31
Recommended by Mother	1 32	1 32	1 32	1 32	1 32	1 32	1 32
Recommended by other family member	1 33	1 33	1 33	1 33	1 33	1 33	1 33
Saw it advertised	1 34	1 34	1 34	1 34	1 34	1 34	1 34
It was the cheapest	1 35	1 35	1 35	1 35	1 35	1 35	1 35
Recommended by Chemist	1 36	1 36	1 36	1 36	1 36	1 36	1 36
Recommended by Doctor	1 37	1 37	1 37	1 37	1 37	1 37	1 37
Available in trial size	1 38	1 38	1 38	1 38	1 38	1 38	1 38
Saw it being used in the hospital	1 39	1 39	1 39	1 39	1 39	1 39	1 39
Used it before	1 40	1 40	1 40	1 40	1 40	1 40	1 40
	A ☐☐ 41 42	B ☐☐ 41 42	C ☐☐ 41 42	D ☐☐ 41 42	E ☐☐ 41 42	F ☐☐ 41 42	G ☐☐ 41 42

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH	A	B	C	D	E	F	G
30. **Have you tried other formulas?** (Only asked after formula introduced for the first time)	(43)	(43)	(43)	(43)	(43)	(43)	(43)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH 31. (If other formula has been introduced)**What other type of formula?**(Do not prompt, unless answers 'I don't know')	A	B	C	D	E	F	G
SMA	01	01	01	01	01	01	01
S41	02	02	02	02	02	02	02
Lactogen	03	03	03	03	03	03	03
Enfamil	04	04	04	04	04	04	04
Nan	05	05	05	05	05	05	05
Isomil	06	06	06	06	06	06	06
Infasoy	07	07	07	07	07	07	07
Prosobee	08	08	08	08	08	08	08
Karotene	09	09	09	09	09	09	09
O-Lac	10	10	10	10	10	10	10
Enfalac normal iron	11	11	11	11	11	11	11
Enfalac reduced iron	12	12	12	12	12	12	12
Specialised infant formula / other	13	13	13	13	13	13	13
	A ☐☐ 44 45	B ☐☐ 44 45	C ☐☐ 44 45	D ☐☐ 44 45	E ☐☐ 44 45	F ☐☐ 44 45	G ☐☐ 44 45

BOTH 32. **Why did you try this particular formula?**	A	B	C	D	E	F	G
Recommended by hospital staff	1 46	1 46	1 46	1 46	1 46	1 46	1 46
Recommended by Child Nurse	1 47	1 47	1 47	1 47	1 47	1 47	1 47
Recommended by Friend	1 48	1 48	1 48	1 48	1 48	1 48	1 48
Recommended by Mother	1 49	1 49	1 49	1 49	1 49	1 49	1 49
Recommended by other family member	1 50	1 50	1 50	1 50	1 50	1 50	1 50
Saw it advertised	1 51	1 51	1 51	1 51	1 51	1 51	1 51
It was the cheapest	1 52	1 52	1 52	1 52	1 52	1 52	1 52
Recommended by Chemist	1 53	1 53	1 53	1 53	1 53	1 53	1 53
Recommended by Doctor	1 54	1 54	1 54	1 54	1 54	1 54	1 54
Available in trial size	1 55	1 55	1 55	1 55	1 55	1 55	1 55
Saw it being used in the hospital	1 56	1 56	1 56	1 56	1 56	1 56	1 56
	A ☐☐ 57 58	B ☐☐ 57 58	C ☐☐ 57 58	D ☐☐ 57 58	E ☐☐ 57 58	F ☐☐ 57 58	G ☐☐ 57 58

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH 33. **If saw advertised, where did you see it advertised?**	A ☐☐ 59 60	B ☐☐ 59 60	C ☐☐ 59 60	D ☐☐ 59 60	E ☐☐ 59 60	F ☐☐ 59 60	G ☐☐ 59 60

A _____

B _____

C _____

D _____

E _____

F _____

G _____

BOTH	A	B	C	D	E	F	G
34. **Is your baby having anything other than milk or formula?**	(61)	(61)	(61)	(61)	(61)	(61)	(61)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH

35. (If yes), what is your baby having? **Do not prompt, but probe for more than one answer**	A	B	C	D	E	F	G
Boiled water	1 62	1 62	1 62	1 62	1 62	1 62	1 62
Fruit juice	1 63	1 63	1 63	1 63	1 63	1 63	1 63
Rusks	1 64	1 64	1 64	1 64	1 64	1 64	1 64
Infant cereal	1 65	1 65	1 65	1 65	1 65	1 65	1 65
Milk based desserts/yoghurt	1 66	1 66	1 66	1 66	1 66	1 66	1 66
Biscuits in a bottle	1 67	1 67	1 67	1 67	1 67	1 67	1 67
Fruit gels	1 68	1 68	1 68	1 68	1 68	1 68	1 68
Cooked/pureed/mashed fruit (include mashed banana)	1 69	1 69	1 69	1 69	1 69	1 69	1 69
Cooked vegetables	1 70	1 70	1 70	1 70	1 70	1 70	1 70
Bread	1 71	1 71	1 71	1 71	1 71	1 71	1 71
Protein foods	1 72	1 72	1 72	1 72	1 72	1 72	1 72
Biscuits	1 73	1 73	1 73	1 73	1 73	1 73	1 73
Fruit	1 74	1 74	1 74	1 74	1 74	1 74	1 74
Raw vegetables	1 75	1 75	1 75	1 75	1 75	1 75	1 75
BOTH Other responses - Baby food other than milk	A 76 77	B 76 77	C 76 77	D 76 77	E 76 77	F 76 77	G 76 77

A _____

B _____

C _____

D _____

E _____

F _____

G _____

MAIN RECORD CODE	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
IDENTIFICATION NUMBER	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4
RECORD NUMBER	3 5	3 5	3 5	3 5	3 5	3 5	3 5

BOTH	A	B	C	D	E	F	G
36. **Is your baby using any of the following?** (Prompt for each one)							
dummy	1 6	1 6	1 6	1 6	1 6	1 6	1 6
bottle	1 7	1 7	1 7	1 7	1 7	1 7	1 7
feeding spoon	1 8	1 8	1 8	1 8	1 8	1 8	1 8
feeding cup	1 9	1 9	1 9	1 9	1 9	1 9	1 9

BOTH (If not giving solids)	A	B	C	D	E	F	G
37. **At what age do you plan to first give your baby solids?**	(10)	(10)	(10)	(10)	(10)	(10)	(10)
less than 2 months	1	1	1	1	1	1	1
between 2 and 3 months	2	2	2	2	2	2	2
between 4 and 6 months	3	3	3	3	3	3	3
between 7 and 9 months	4	4	4	4	4	4	4
between 10 and 12 months	5	5	5	5	5	5	5
over 12 months	6	6	6	6	6	6	6

BOTH 38. **Has your baby experienced any health problems since I spoke to you last (or since leaving hospital)?**	A (11)	B (11)	C (11)	D (11)	E (11)	F (11)	G (10)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH 39. **If yes, type of problem**	A	B	C	D	E	F	G
vomiting	1 12	1 12	1 12	1 12	1 12	1 12	1 12
diarrhoea	1 13	1 13	1 13	1 13	1 13	1 13	1 13
respiratory	1 14	1 14	1 14	1 14	1 14	1 14	1 14
skin - rash, dermatitis, etc.,	1 15	1 15	1 15	1 15	1 15	1 15	1 15
jaundice	1 16	1 16	1 16	1 16	1 16	1 16	1 16
colic	1 17	1 17	1 17	1 17	1 17	1 17	1 17
	A ☐☐ 18 19	B ☐☐ 18 19	C ☐☐ 18 19	D ☐☐ 18 19	E ☐☐ 18 19	F ☐☐ 18 19	G ☐☐ 18 19

Other problem (baby)

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH 40. **Did you take your baby to see anyone about this problem?** If yes, who?	A	B	C	D	E	F	G
No	1 20	1 20	1 20	1 20	1 20	1 20	1 20
Yes, local GP	1 21	1 21	1 21	1 21	1 21	1 21	1 21
Yes, paediatrician	1 22	1 22	1 22	1 22	1 22	1 22	1 22
Yes, child health nurse	1 23	1 23	1 23	1 23	1 23	1 23	1 23
Yes, A & E , PMH	1 24	1 24	1 24	1 24	1 24	1 24	1 24
	A ☐ 25	B ☐ 25	C ☐ 25	D ☐ 25	E ☐ 25	F ☐ 25	G ☐ 25

Other responses

A _____

B _____

C _____

D _____

E _____

F _____

G _____

BOTH

41. Have you experienced any health problems since I spoke to you last (or since leaving hospital)?

	A	B	C	D	E	F	G
	(26)	(26)	(26)	(26)	(26)	(26)	(26)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

BOTH

42. If yes, type of problem

A	B	C	D	E	F	G
☐☐ 27 28	☐☐ 27 28	☐☐ 27 28	☐☐ 27 28	☐☐ 27 28	☐☐ 27 28	☐☐ 27 28

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH

43. Did you see anyone about this problem?

	A	B	C	D	E	F	G
No	1 29	1 29	1 29	1 29	1 29	1 29	1 29
Yes, local GP	1 30	1 30	1 30	1 30	1 30	1 30	1 30
Yes, gynaecologist	1 31	1 31	1 31	1 31	1 31	1 31	1 31
	A ☐ 32	B ☐ 32	C ☐ 32	D ☐ 32	E ☐ 32	F ☐ 32	G ☐ 32

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH

44. Have you experienced any major changes in your life since I spoke to you last (or since leaving hospital)?

	A	B	C	D	E	F	G
No	1 33	1 33	1 33	1 33	1 33	1 33	1 33
Yes, moved house	1 34	1 34	1 34	1 34	1 34	1 34	1 34
Yes, death in the family	1 35	1 35	1 35	1 35	1 35	1 35	1 35
Yes, divorce, separation	1 36	1 36	1 36	1 36	1 36	1 36	1 36
Yes, sickness in the family	1 37	1 37	1 37	1 37	1 37	1 37	1 37
	A ☐ 38	B ☐ 38	C ☐ 38	D ☐ 38	E ☐ 38	F ☐ 38	G ☐ 38

Other (major change)

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH	A	B	C	D	E	F	G
45. **Are you currently on the pill?**	(39)	(39)	(39)	(39)	(39)	(39)	(39)
No	1	1	1	1	1	1	1
Yes	2	2	2	2	2	2	2

BOTH	A	B	C	D	E	F	G
46. **(If taking OCA), which pill are you on?**	(40)	(40)	(40)	(40)	(40)	(40)	(40)
Regular pill	1	1	1	1	1	1	1
Mini-pill	2	2	2	2	2	2	2

	A	B	C	D	E	F	G
47. **Are you taking any other medications at the moment?**	(41)	(41)	(41)	(41)	(41)	(41)	(41)
No	1	1	1	1	1	1	1
Yes	2	2	2	2	2	2	2

BOTH	A	B	C	D	E	F	G
48. **What medications you are taking?**	☐☐ (42 43)	☐☐ (42 43)	☐☐ (42 43)	☐☐ (42 43)	☐☐ (42 43)	☐☐ (42 43)	☐☐ (42 43)

A _____
B _____
C _____
D _____
E _____
F _____
G _____

BOTH 49. Have you had **help from anyone**, on a daily or almost daily basis, since we last spoke (or since you left hospital)?	A	B
No	1 44	1 44
Yes, husband/partner	1 45	1 45
Yes, mother	1 46	1 46
Yes, other family member or in-law	1 47	1 47
Yes, friend/s	1 48	1 48
Paid help	1 49	1 49
Nappy service	1 50	1 50

BOTH 50. **If yes, what type of help did you receive?**	A	B
House-work	1 51	1 51
Caring for the other children	1 52	1 52
Caring for baby to give me a break	1 53	1 53
Shopping	1 54	1 54
Cooking	1 55	1 55

BOTH 51. **Since you have been home, how helpful has your husband / partner been in caring for the baby?**	A
Read out answers	(56)
Not helpful	1
Sometimes helpful or tries	2
Very helpful	3
Baby's father not around	4

BOTH	A
52. Was the baby's father present at the birth?	(57)
Yes	1
Would have been but he couldn't	2
No	3

BOTH	A	B	C	D	E	F	G
53. Have you visited the Child Health Nurse since we last spoke (or since you left hospital)?	(58)	(58)	(58)	(58)	(58)	(58)	(58)
No	1	1	1	1	1	1	1
Yes	2	2	2	2	2	2	2

BOTH	A	B	C	D	E	F	G
54. How much does your baby weigh? (grams)	59 62	59 62	59 62	59 62	59 62	59 62	59 62
When was that weight taken? Date D D M M	63 66	63 66	63 66	63 66	63 66	63 66	63 66

BOTH	A	B	C	D	E	F	G
55. How long is your baby? (cm)	67 68	67 68	67 68	67 68	67 68	67 68	67 68
When was that length taken? Date D D M M	69 72	69 72	69 72	69 72	69 72	69 72	69 72

MAIN RECORD CODE	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
IDENTIFICATION NUMBER	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4
RECORD NUMBER	4 5	4 5	4 5	4 5	4 5	4 5	4 5

BOTH	A	B	C	D	E	F	G
56. How do you feel about your baby's weight change since birth?	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Read out options							
Satisfied/pleased	1	1	1	1	1	1	1
A little concerned	2	2	2	2	2	2	2
Very worried or concerned	3	3	3	3	3	3	3
Don't know	4	4	4	4	4	4	4

BOTH	A	B	C	D	E	F	G
57. How would you describe your baby's temperament?	(7)	(7)	(7)	(7)	(7)	(7)	(7)
Open ended							
Placid / easy going	1	1	1	1	1	1	1
Irritable / fussy	2	2	2	2	2	2	2
Combination	3	3	3	3	3	3	3
Don't know	4	4	4	4	4	4	4

NOT FOR TERMINATION

The following questions are on your feelings about breast-feeding. So there are no right or wrong answers. For example the first question is "How would you rate your confidence in breast-feeding?" If you can imagine a ruler with five points on it. At one end of the ruler is "not confident" and at the other end of the ruler is five, which is "very confident". Can you give me a number from one to five.

	A	B	C	D	E	F	G
58. How would you rate your **confidence in breast-feeding**?	(8)	(8)	(8)	(8)	(8)	(8)	(8)
1 not confident	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very confident	5	5	5	5	5	5	5
59. How **enjoyable** do you find breast-feeding?	A(9)	B(9)	C(9)	D(9)	E(9)	F(9)	G(9)
1 not enjoyable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very enjoyable	5	5	5	5	5	5	5
60. How **satisfied** are you with your breast-feeding experience?	A	B	C	D	E	F	G
	(10)	(10)	(10)	(10)	(10)	(10)	(10)
1 not satisfied	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very satisfied	5	5	5	5	5	5	5

	A	B	C	D	E	F	G
61. **In general**, how comfortable would you or do you feel while breast-feeding in front of **other people**?	(11)	(11)	(11)	(11)	(11)	(11)	(11)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
62. In general, how comfortable would you or do you feel while breast-feeding in front of **female friends**?	A	B	C	D	E	F	G
	(12)	(12)	(12)	(12)	(12)	(12)	(12)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
	9	9	9	9	9	9	9
63. In general, how comfortable would you or do you feel while breast-feeding in front of **female relatives** e.g., mother, sister?	A	B	C	D	E	F	G
	(13)	(13)	(13)	(13)	(13)	(13)	(13)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

64. In general, how comfortable would you or do you feel while breast-feeding in front of **male friends**?	A	B	C	D	E	F	G
	(14)	(14)	(14)	(14)	(14)	(14)	(14)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

65. In general, how comfortable would you or do you feel while breast-feeding in front of **male relatives** e.g., father, brother?	A	B	C	D	E	F	G
	(15)	(15)	(15)	(15)	(15)	(15)	(15)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

66. In general, how comfortable would you or do you feel while breast-feeding in **someone else's house**?	A	B	C	D	E	F	G
	(16)	(16)	(16)	(16)	(16)	(16)	(16)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

67. In general, how comfortable would you or do you feel while breast-feeding on **public transport**?	A	B	C	D	E	F	G
	(17)	(17)	(17)	(17)	(17)	(17)	(17)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

68. In general, how comfortable would you or do you feel while breast-feeding in a **public eating place**?	A	B	C	D	E	F	G
	(18)	(18)	(18)	(18)	(18)	(18)	(18)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

69. In general, how comfortable would you or do you feel while breast-feeding in a public place such as a **park or the beach**?	A	B	C	D	E	F	G
	(19)	(19)	(19)	(19)	(19)	(19)	(19)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
9	9	9	9	9	9	9	9

70. In general, how comfortable would you or do you feel while breast-feeding in a public place such as Hay Street Mall?	A	B	C	D	E	F	G
	(20)	(20)	(20)	(20)	(20)	(20)	(20)
1 not comfortable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very comfortable	5	5	5	5	5	5	5
	9	9	9	9	9	9	9

BOTH (ONCE ONLY)	A	B	C	D	E	F	G
71. **Do you smoke?**	(21)	(21)	(21)	(21)	(21)	(21)	(21)
Yes	1	1	1	1	1	1	1
Usually, but not at the moment(**ASKED AGAIN if this option chosen**)	2	2	2	2	2	2	2
No	3	3	3	3	3	3	3

BOTH (ONCE ONLY)	A	B	C	D	E	F	G
72. **How many cigarettes do you smoke per day on average?**	(22)	(22)	(22)	(22)	(22)	(22)	(22)
Less than 5	1	1	1	1	1	1	1
5 to 9	2	2	2	2	2	2	2
10 to 19	3	3	3	3	3	3	3
20 to 30	4	4	4	4	4	4	4
More than 30	5	5	5	5	5	5	5

BOTH	A	B	C	D	E	F	G
73. **How does the baby's father feel about breast-feeding and bottle-feeding?**	(23)	(23)	(23)	(23)	(23)	(23)	(23)
He prefers breast-feeding, but will support whatever I do	1	1	1	1	1	1	1
He prefers bottle-feeding, but will support whatever I do	2	2	2	2	2	2	2
He prefers breast-feeding	3	3	3	3	3	3	3
He prefers bottle-feeding	4	4	4	4	4	4	4
He doesn't mind how I feed my baby	5	5	5	5	5	5	5
Never really discussed the matter with him	6	6	6	6	6	6	6

BOTH (ONCE ONLY)

74. **In general, what effect do you think breast-feeding has on a woman's weight?**

	A
	(24)
No effect	1
Helps reduce weight	2
Keeps the weight on	3
Don't know/not sure	4

BOTH (ONCE ONLY)

75. **In general, what effect do you think breast-feeding has on the shape or size of a woman's breasts after she has stopped feeding?**

	A	
it causes breasts to sag	1	25
it doesn't make any difference	1	26
makes them smaller	1	27
don't know / not sure	1	28

Other response

_____ A ☐

_____ (29)

NOT FOR TERMINATION

76. **At what age do you plan to stop breast-feeding?**

	A	B	C	D	E	F	G
	(30)	(30)	(30)	(30)	(30)	(30)	(30)
before 9 weeks	1	1	1	1	1	1	1
between 9 weeks and 2 months	2	2	2	2	2	2	2
between 2 and 3 months	3	3	3	3	3	3	3
between 4 and 9 months	4	4	4	4	4	4	4
between 7 and 8 months	5	5	5	5	5	5	5
between 9 and 12 months	6	6	6	6	6	6	6
over twelve months	7	7	7	7	7	7	7
when gets teeth	8	8	8	8	8	8	8
don't know	9	9	9	9	9	9	9
	A ☐	B ☐	C ☐	D ☐	E ☐	F ☐	G ☐
	31	31	31	31	31	31	31

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

BOTH TWO WEEKS ONLY I'm going to read out a few statements which are related to breast-feeding. Please just answer True, False or Don't know. It really doesn't matter if you don't know.	A
77. Feeding more often increases milk supply	(32)
True	1
False	2
Don't know	3
78. Babies need to feed more when they are having a growth spurt	(33)
True	1
False	2
Don't know	3
79. There are lots of women who need to give their babies formula because they can't make enough milk	(34)
True	1
False	2
Don't know	3
80. Birth Control Pills can reduce milk supply	(35)
True	1
False	2
Mini-pill won't but normal pill will	3
Don't know	4

81. Getting extra rest and relaxation is necessary to ensure a good milk supply	A (36)
True	1
False	2
Don't know	3
82. Feeding formula to a one month old baby will not reduce the amount of milk produced by the mother	(37)
True	1
False	2
Don't know	3
83. Babies naturally know how to breast-feed correctly	(38)
True	1
False	2
Don't know	3
84. Formula-fed babies sleep longer at night	(39)
True	1
False	2
Don't know	3

TERMINATION QUESTIONS

	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
MAIN RECORD CODE							
IDENTIFICATION NUMBER	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4
RECORD NUMBER	5 5	5 5	5 5	5 5	5 5	5 5	5 5

	A	B	C	D	E	F	G
85. **When did you stop breast-feeding?** Date D D M M	6 9	6 9	6 9	6 9	6 9	6 9	6 9
86. **How old was _____ when you stopped breast-feeding?** (weeks)	10 11	10 11	10 11	10 11	10 11	10 11	10 11
(months)	12 13	12 13	12 13	12 13	12 13	12 13	12 13

87. **Why did you decide to stop breast feeding?**	A	B	C	D	E	F	G
Prolonged breast-feeding reasons							
baby old enough to not be breast-fed	1 14	1 14	1 14	1 14	1 14	1 14	1 14
baby weaned itself	1 15	1 15	1 15	1 15	1 15	1 15	1 15
I've done my bit, given a good start	1 16	1 16	1 16	1 16	1 16	1 16	1 16

Problems/pain							
Breast feeding too painful	1 17	1 17	1 17	1 17	1 17	1 17	1 17
cracked or bleeding nipples	1 18	1 18	1 18	1 18	1 18	1 18	1 18
breast engorgement	1 19	1 19	1 19	1 19	1 19	1 19	1 19
breast infection/mastitis	1 20	1 20	1 20	1 20	1 20	1 20	1 20
inverted nipples	1 21	1 21	1 21	1 21	1 21	1 21	1 21
problem with nursing technique	1 22	1 22	1 22	1 22	1 22	1 22	1 22
Maternal psychological							
mother anxious or unsure about breast-feeding	1 23	1 23	1 23	1 23	1 23	1 23	1 23
breast-feeding requires too much motivation	1 24	1 24	1 24	1 24	1 24	1 24	1 24
breast feeding too difficult	1 25	1 25	1 25	1 25	1 25	1 25	1 25
breast feeding too inconvenient	1 26	1 26	1 26	1 26	1 26	1 26	1 26
mother has been under stress	1 27	1 27	1 27	1 27	1 27	1 27	1 27
mother too tired	1 28	1 28	1 28	1 28	1 28	1 28	1 28
dislike breast-feeding	1 29	1 29	1 29	1 29	1 29	1 29	1 29
concern about how breast-feeding will affect your figure	1 30	1 30	1 30	1 30	1 30	1 30	1 30
Insufficient milk/ other baby factors							
can't tell how much infant is drinking	1 31	1 31	1 31	1 31	1 31	1 31	1 31
my milk isn't good enough	1 32	1 32	1 32	1 32	1 32	1 32	1 32
Not enough milk	1 33	1 33	1 33	1 33	1 33	1 33	1 33
Baby not gaining enough weight	1 34	1 34	1 34	1 34	1 34	1 34	1 34
Baby no longer interested in the breast	1 35	1 35	1 35	1 35	1 35	1 35	1 35
Baby biting nipples	1 36	1 36	1 36	1 36	1 36	1 36	1 36
baby prefers a bottle	1 37	1 37	1 37	1 37	1 37	1 37	1 37
baby ready for solids	1 38	1 38	1 38	1 38	1 38	1 38	1 38
baby ill	1 39	1 39	1 39	1 39	1 39	1 39	1 39

	A	B	C	D	E	F	G
Other maternal factors							
mother ill	1 40	1 40	1 40	1 40	1 40	1 40	1 40
Use of prescription medication	1 41	1 41	1 41	1 41	1 41	1 41	1 41
Wanted to go onto OCA	1 42	1 42	1 42	1 42	1 42	1 42	1 42
Return to work or study	1 43	1 43	1 43	1 43	1 43	1 43	1 43
Paternal factors							
baby's father preferred bottle-feeding	1 44	1 44	1 44	1 44	1 44	1 44	1 44
baby's father can help with bottle-feeding	1 45	1 45	1 45	1 45	1 45	1 45	1 45
	A 46 47	B 46 47	C 46 47	D 46 47	E 46 47	F 46 47	G 46 47

Other responses

A _____ E _____

B _____ F _____

C _____ G _____

D _____

TERMINATION

88. Did you ask for advice or help from anyone about your breast-feeding problem(s) ?

If yes, who?	A	B	C	D	E	F	G
No	1 48	1 48	1 48	1 48	1 48	1 48	1 48
Yes, doctor	1 49	1 49	1 49	1 49	1 49	1 49	1 49
Yes, child health nurse	1 50	1 50	1 50	1 50	1 50	1 50	1 50
Yes, hospital midwife	1 51	1 51	1 51	1 51	1 51	1 51	1 51
yes, friend/s	1 52	1 52	1 52	1 52	1 52	1 52	1 52
yes, mother	1 53	1 53	1 53	1 53	1 53	1 53	1 53
yes,other family member	1 54	1 54	1 54	1 54	1 54	1 54	1 54
yes, NMA	1 55	1 55	1 55	1 55	1 55	1 55	1 55
	A 56 57	B 56 57	C 56 57	D 56 57	E 56 57	F 56 57	G 56 57

Other responses

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

TERMINATION

89. **Did you expect to have difficulties with breast-feeding?**	A (58)	B (58)	C (58)	D (58)	E (58)	F (58)	G (58)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

90. **Did you plan to stop breast-feeding now (when you did)?**	A (59)	B (59)	C (59)	D (59)	E (59)	F (59)	G (59)
Yes	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2

91. **If not, at what age did you plan to stop breast-feeding?**	A (60)	B (60)	C (60)	D (60)	E (60)	F (60)	G (60)
before 6 weeks	1	1	1	1	1	1	1
between 6 weeks and 2 months	2	2	2	2	2	2	2
between 2 and 3 months	3	3	3	3	3	3	3
between 4 and 9 months	4	4	4	4	4	4	4
between 7 and 8 months	5	5	5	5	5	5	5
between 9 and 12 months	6	6	6	6	6	6	6
over twelve months	7	7	7	7	7	7	7
when gets teeth	8	8	8	8	8	8	8
	A ☐ (61)	B ☐ (61)	C ☐ (61)	D ☐ (61)	E ☐ (61)	F ☐ (61)	G ☐ (61)

Other responses

A _____

B _____

C _____

D _____

E _____

F _____

G _____

92. **Did anyone advise you to stop breastfeeding?**	A	B	C	D	E	F	G
No	1 62	1 62	1 62	1 62	1 62	1 62	1 62
Child Health Sister	1 63	1 63	1 63	1 63	1 63	1 63	1 63
Local doctor	1 64	1 64	1 64	1 64	1 64	1 64	1 64
Specialist (specify)_____	☐ (65)	☐ (65)	☐ (65)	☐ (65)	☐ (65)	☐ (65)	☐ (65)
NMA	1 66	1 66	1 66	1 66	1 66	1 66	1 66
Friend	1 67	1 67	1 67	1 67	1 67	1 67	1 67
Mother	1 68	1 68	1 68	1 68	1 68	1 68	1 68
	A ☐ (69)	B ☐ (69)	C ☐ (69)	D ☐ (69)	E ☐ (69)	F ☐ (69)	G ☐ (69)

Other responses

A _____

B _____

C _____

D _____

E _____

F _____

G _____

MAIN RECORD CODE	A (1)	B (1)	C (1)	D (1)	E (1)	F (1)	G (1)
IDENTIFICATION NUMBER	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4	2 3 4
RECORD NUMBER	6 5	6 5	6 5	6 5	6 5	6 5	6 5

93. **Would you breast-feed another child if you had another baby**	A	B	C	D	E	F	G
	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Yes	1	1	1	1	1	1	1
Yes, if I could	2	2	2	2	2	2	2
No	3	3	3	3	3	3	3

94. **Unprompted but probe for more than one**	A	B	C	D	E	F	G
If yes, why?							
better for baby	1 7	1 7	1 7	1 7	1 7	1 7	1 7
better for mother	1 8	1 8	1 8	1 8	1 8	1 8	1 8
more contented baby	1 9	1 9	1 9	1 9	1 9	1 9	1 9
natural	1 10	1 10	1 10	1 10	1 10	1 10	1 10
closer relationship with baby	1 11	1 11	1 11	1 11	1 11	1 11	1 11
convenience	1 12	1 12	1 12	1 12	1 12	1 12	1 12
enjoyment/satisfaction of mother	1 13	1 13	1 13	1 13	1 13	1 13	1 13
no particular reason	1 14	1 14	1 14	1 14	1 14	1 14	1 14

Other responses, why would breast-feed another child

A	B	C	D	E	F	G
15 16	15 16	15 16	15 16	15 16	15 16	15 16

A
B
C
D
E
F
G

Unprompted but probe for more than one 95. **If no, why wouldn't breast-feed another child?**	A	B	C	D	E	F	G
inconvenient	1 17	1 17	1 17	1 17	1 17	1 17	1 17
lack of enjoyment/satisfaction of mother	1 18	1 18	1 18	1 18	1 18	1 18	1 18
tied to the house	1 19	1 19	1 19	1 19	1 19	1 19	1 19
embarrassment	1 20	1 20	1 20	1 20	1 20	1 20	1 20
too emotionally taxing for mother	1 21	1 21	1 21	1 21	1 21	1 21	1 21
formula is just as good	1 22	1 22	1 22	1 22	1 22	1 22	1 22

Other responses, why wouldn't breast-feed another child

A	B	C	D	E	F	G
23 24	23 24	23 24	23 24	23 24	23 24	23 24

A
B
C
D
E
F
G

96. **Would you encourage a friend to breast-feed?**	A	B	C	D	E	F	G
	(25)	(25)	(25)	(25)	(25)	(25)	(25)
Yes, definitely	1	1	1	1	1	1	1
Yes, probably	2	2	2	2	2	2	2
Perhaps	3	3	3	3	3	3	3
If she wants to	4	4	4	4	4	4	4
No	5	5	5	5	5	5	5

97. **If yes, why encourage friend?** **Unprompted but probe for more than one**	A	B	C	D	E	F	G
better for baby	1 26	1 26	1 26	1 26	1 26	1 26	1 26
better for mother	1 27	1 27	1 27	1 27	1 27	1 27	1 27
more contented baby	1 28	1 28	1 28	1 28	1 28	1 28	1 28
natural	1 29	1 29	1 29	1 29	1 29	1 29	1 29
closer relationship with baby	1 30	1 30	1 30	1 30	1 30	1 30	1 30
convenience	1 31	1 31	1 31	1 31	1 31	1 31	1 31
enjoyment/satisfaction of mother	1 32	1 32	1 32	1 32	1 32	1 32	1 32
no particular reason	1 33	1 33	1 33	1 33	1 33	1 33	1 33

Other responses, why would encourage friend	A	B	C	D	E	F	G
	34 35	34 35	34 35	34 35	34 35	34 35	34 35

A _____
B _____
C _____
D _____
E _____
F _____
G _____

98. **If no, why wouldn't encourage friend** **Unprompted but probe for more than one**	A	B	C	D	E	F	G
inconvenient	1 36	1 36	1 36	1 36	1 36	1 36	1 36
lack of enjoyment/satisfaction of mother	1 37	1 37	1 37	1 37	1 37	1 37	1 37
tied to the house	1 38	1 38	1 38	1 38	1 38	1 38	1 38
embarrassment	1 39	1 39	1 39	1 39	1 39	1 39	1 39
too emotionally taxing for mother	1 40	1 40	1 40	1 40	1 40	1 40	1 40
formula is just as good	1 41	1 41	1 41	1 41	1 41	1 41	1 41

Other responses, why wouldn't breast-feed another child	A	B	C	D	E	F	G
	42 43	42 43	42 43	42 43	42 43	42 43	42 43

A _____
B _____
C _____
D _____
E _____
F _____
G _____

The following questions are on your feelings about breast-feeding. So there are no right or wrong answers.

For example the first question is "How would you rate your breast-feeding experience?" If you can imagine a ruler with five points on it. At one end of the ruler is "not successful" and at the other end of the ruler is five, which is "very successful". Where do you think you would fit on the ruler?

99. **How would you describe your breast-feeding experience?**	A	B	C	D	E	F	G
	(44)	(44)	(44)	(44)	(44)	(44)	(44)
1 not successful	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very successful	5	5	5	5	5	5	5
9 uncertain	9	9	9	9	9	9	9

100. **How enjoyable did you find breast-feeding?**	A	B	C	D	E	F	G
	(45)	(45)	(45)	(45)	(45)	(45)	(45)
1 not enjoyable	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very enjoyable	5	5	5	5	5	5	5
9 uncertain	9	9	9	9	9	9	9

101. **How satisfied are you with your breast-feeding experience?**	A (46)	B (46)	C (46)	D (46)	E (46)	F (46)	G (46)
1 not satisfied	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very satisfied	5	5	5	5	5	5	5
9 uncertain	9	9	9	9	9	9	9

EARLY TERMINATORS ONLY 102. **How satisfied are you with your babies adjustment to formula?**	A (47)	B (47)	C (47)	D (47)	E (47)	F (47)	G (47)
1 not satisfied	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5 very satisfied	5	5	5	5	5	5	5
9 uncertain	9	9	9	9	9	9	9

Appendix 3

Papers published in peer review journals

Note: For copyright reasons Appendix 3, which contains the following articles, has not been reproduced.

Scott, Jane A., Colin Binns & Rosalie A. Aroni (1996) Breast-feeding in Perth: recent trends. Australian and New Zealand Journal of Public Health 20(2): 210- 211.

Scott, Jane A., Colin W. Binns & Ruth V. Arnold (1997) Attitudes toward breastfeeding in Perth, Australia: qualitative analysis. Journal of Nutrition Education 29(5); 244-249.

Scott, J. A., C. W. Binns and R. A. Aroni (1997) The influence of reported paternal attitudes on the decision to breast-feed. Journal of Paediatrics and Child Health 33: 305-307.

(Co-ordinator, ADT Project (Retrospective), Curtin University of Technology, 8.1.03)

Appendix 4

Abstracts of conference presentations

Note: For copyright reasons Appendix 4, which contains abstracts to conference papers noted below, has not been reproduced.

Scott, Jane, Colin Binns, Rosalie Aroni Is breast-feeding in Australia on the decline? Proceedings Dietitans Association of Australia 13th National Conference, 1994, p. 69.

Scott, J.A. & C.W. Binns Breast-feeding practices amongst Perth women. Proceedings of the Nutrition Society of Australia, 1995, p. 115.

(Co-ordinator, ADT Project (Retrospective), Curtin University of Technology, 8.1.03)