The Glasgow Infant Feeding Action Research Project:

an evaluation of a community based intervention designed to increase the prevalence of breastfeeding in a socially disadvantaged urban area.

By

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To Rhiannon, who turned theory into practice.

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Declaration

I declare that this thesis embodies the results of my own research, that it has been composed by myself and that it does not include work forming part of a thesis presented by me for a degree at this or any other University.

Following the decision of the GGHB to initiate breastfeeding promotion activities, including the funding of an action research project to evaluate a community based intervention aimed at a socially disadvantaged area, I was appointed to my present position in October 1993.

My role, as research midwife, was to plan, design and evaluate methods of collecting data; to collaborate in the design of an appropriate training package for lay Breastfeeding Helpers; to recruit and train the Helpers; to ensure contact between the Helpers and the study subjects; to provide on-going support to the Helpers and to collate, analyse and interpret the study data.

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Definition of Terms

Abortion	spontaneous loss of a pregnancy before 24 weeks gestation
Antenatal	during pregnancy
Any breast/feeding	applies to babies who are exclusively breastfed and those who are receiving a combination of breast milk and artificial milk
Artificial milk	human milk substitute
Booking visit	the first antenatal clinic visit made by the woman in the current pregnancy, usually about 12-13 weeks gestation.
Bottle-fed baby	a baby fed only human milk substitutes
Bottle-feeding	applies to the offering of human milk substitutes
Breast and bottle-feeding	applies to babies receiving breast and artificial milk
Breastfed baby	a baby fed some human milk
Breastfeeding	applies to babies receiving human milk
Breastmilk	milk produced by the human breast, human milk
Caesarean section	surgical removal of foetus and products of conception abdominally after period of viability
Colostrum	nourishing fluid secreted from the breast before lactation is established
Deprivation Category (Depcat)	a measure of deprivation that applies to an area (usually a postcode sector) based on the percentage of households with no car, overcrowding, male unemployment and low social class. One (1) is the most affluent while seven (7) is the most deprived (Carstairs and Morris, 1991).
Exclusive breastfeeding	applies to babies receiving only human milk
Exclusively breastfed baby	a baby fed only human milk
Expressed breast milk	expressed maternal breastmilk (human milk), fed to baby by cup, tube or bottle
Human milk	milk produced by the human breast, breastmilk

Infant mortality	death in the first year of life of infants born alive (includes neonatal deaths)
Low birth-weight	less than 2,500g (includes premature and mature infants)
Multigravid	woman who is pregnant for the second or subsequent time
Neonatal death	death within 28 days of birth
Normal delivery	cephalic presentation which delivers spontaneously
Parous	woman who has delivered a viable (24 weeks or more) infant
Perinatal mortality	stillbirths plus deaths in the first week of life expressed per 1,000 total births
Period of Gestation	the number of completed weeks from the first day of the last menstrual period to the date in question
Phenylketonuria	a hereditary enzyme deficiency which can cause mental retardation
Postnatal period	a time period of four weeks following delivery
Postnatal	following delivery
Postpartum	following delivery
Premature infant	one born before 37 completed weeks' gestation
Prenatal	during pregnancy
Primigravid	woman who is pregnant for the first time
Puerperium	a time period of six weeks following delivery
Return visit	the follow up antenatal clinic visit, usually between 28 and 36 weeks gestation
Stillbirth	an infant born after 24 weeks gestation who did not breath or show signs of life
Term	from 37-42 completed weeks of gestation
Vacuum extraction	procedure to deliver the foetal head vaginally, by traction on a suction cup
Viable foetus	one which has reached 24 weeks gestation

Abbreviations

AN	Antenatal
ANC	Antenatal Clinic
BFHI	Baby Friendly Hospital Initiative
CI	Confidence Interval
COMA	Committee of the Medical Aspects of Food Policy
CS	Caesarean Section
DOMINO	Domicilliary Midwife In-Out
EBM	Expressed breastmilk
GGHB	Greater Glasgow Health Board
GP	General Practitioner
GRMH	Glasgow Royal Maternity Hospital
IBFAN	International Babyfood Action Network
JBI	Joint Breastfeeding Initiative
MEL	Management Executive Letter
NEC	Necrotising Enterocolitis
NS	Not Significant
ONS	Office for National Statistics
OPCS	Office for Population Censuses and Surveys
PN	Postnatal
QMH	Queen Mother's Hospital
RCM	Royal College of Midwives
RR	Relative Risk
SCN	Special Care Nursery
SJBI	Scottish Joint Breastfeeding Initiative
SMR	Scottish Mortality Records
SNAP	Scottish Need Assessment Programme
SOHHD	Scottish Office Home and Health Department
UNICEF	United Nations Children's Fund
WABA	World Alliance on Breastfeeding Action
WHA	World Health Assembly
WHO	World Health Organisation

Summary

Introduction

In many parts of Scotland, breastfeeding is relatively uncommon and attempts to increase its prevalence appear to have had little success. Despite the clear evidence of the risks associated with bottle-feeding it has proved difficult to persuade mothers to change their behaviour in favour of breastfeeding.

There are a number of factors associated with intention to breastfeed and with initiating and continuing breastfeeding. Among these factors are certain socio-demographic characteristics, maternal characteristics and the influences of health professionals and the social and peer group. Breastfeeding is inversely related to poverty, and children from poorer communities are disproportionately higher users of medical services. The proven health benefits of breastfeeding suggest that increasing breastfeeding is one of the most effective measures for improving health in disadvantaged communities.

Aim

The aim of this study was to plan, implement and evaluate an innovative community-based intervention designed to increase the prevalence and duration of breastfeeding in a socio-economically disadvantaged community. It was postulated that, since breastfeeding was influenced by the peer group and by positive role models, a community based system of peer support would be likely to have an impact on breastfeeding behaviour.

Methods

This study was designed as a community-based controlled trial. The intervention, which comprised peer counselling and support, was delivered to one community over a period of two years. Seven local mothers were recruited and trained as peer breastfeeding counsellors or Helpers. These Helpers then provided antenatal women with information about infant feeding options and offered support and encouragement to mothers who were breastfeeding. The support offered consisted of research based practical advice which was specific to individual need. To evaluate the impact, data were collected from this community and a comparable control community by means of four self-completing questionnaires, two

administered antenatally and two postnatally. Additional data were also collected from patient case-records.

Results

The control and intervention communities were socio-demographically similar. Baseline socio-economic indicators demonstrated that the intervention community was slightly more disadvantaged than the control community. Data collected during the study also revealed the two communities to be fairly similar. However, any differences that did occur tended to favour breastfeeding in the control group.

There was a statistically significant increase in the intention to breastfeed during pregnancy in the intervention group ($p<0.05$). However, there were no statistically significant differences in the breastfeeding prevalence between the intervention and the control groups, although there was a statistically non-significant tendency over time for a progressively higher proportion of the intervention group to provide or intend to provide breastmilk when compared to the control group.

When the intervention and control groups were adjusted for socio-economic deprivation status a statistically significantly higher proportion of the intervention group initiated breastfeeding ($p<0.05$), was breastfeeding at hospital discharge ($p<0.05$) and exclusively breastfeeding at six weeks ($p<0.05$) compared to the control group.

Multivariate analyses of possible confounding variables demonstrated a statistically significantly higher proportion of breastfeeding in the intervention group at delivery ($p<0.01$) but did not demonstrate any significant difference at six weeks postnatally.

Intervention group women who stated an antenatal intention to breastfeed were significantly more likely to initiate breastfeeding ($p<0.01$) and to be breastfeeding at discharge ($p<0.01$) and six weeks ($p<0.05$). A statistically significantly higher proportion of the intervention group mothers who stated an intention to breastfeed at booking were also exclusively breastfeeding at six weeks ($p<0.0001$) when compared to the control group.

Breastfeeding was more prevalent in vulnerable sub-groups (e.g. Caesarean Section, admitted to Special Care Nursery) belonging to the intervention than the control community. However these results were not statistically significant.

An important dimension of this study was the impact on the woman, her extended family and the community as a whole. The intervention appeared to be generally acceptable. A change in attitude to both the intervention and to breastfeeding within the community and among health professionals was noted. Comments made by mothers who were encouraged to breastfeed demonstrate the real effect breastfeeding had on them and highlight the importance of good support.

Discussion

Although the impact of this study on breastfeeding prevalence was relatively limited it did show a consistently positive trend in favour of breastfeeding in the intervention area, especially when socio-economic differences between the groups were taken into consideration. However, no differences in overall breastfeeding prevalence rates were demonstrated at six weeks whichever method of data analysis was employed. Women who stated an antenatal intention to breastfeed were assisted to achieve this and a few mothers who had not intended to breastfeed did so successfully. The intervention appeared to be acceptable to health professionals and mothers. It is possible that an intervention lasting longer than two years might have a greater impact on breastfeeding prevalence.

Conclusion

Despite the lack of impact of the intervention at six weeks, a positive trend in breastfeeding in the intervention group study suggests that peer support is a promising strategy for the promotion of breastfeeding in disadvantaged areas.

Chapter 1:
Introduction to Breastfeeding

Chapter 1: Introduction to Breastfeeding

Human milk has evolved over millions of years to meet the needs of the human infant. In addition to providing the baby with all the nutrients required for optimal growth in a form that is readily utilised, human milk is now known to be a highly complex substance with many unique qualities. The increase in knowledge about human milk has served to heighten awareness that replacements are deficient in essential ingredients.

1:1. A brief history

Infant feeding practices have varied according to fashion, medical advice and cultural and religious beliefs. Throughout history, most changes in feeding behaviour began in the upper and middle classes of society and spread to others over a period of time. World-wide, the majority of babies were breastfed up until the middle of the 20th Century.

Written accounts of infant feeding practices prior to the 20th Century are sparse, possibly because the care of the young was mainly the role of the uneducated woman. Much of what was written about breastfeeding was in the form of advice to overcome feeding difficulties or ill health and would not have been accessible to the majority of breastfeeding mothers. It is likely that well-educated mothers, who may have lacked the support networks of the extended family, would have used these texts to assist them to breastfeed their young. Thus these same women then fell victim to ill-founded medical advice and so to the belief that they were too delicate to breastfeed or that they could not produce enough milk. The vast majority of mothers who were unable to read would have continued to breastfeed their babies according to custom (Salmon, 1994).

Despite the predominance of breastfeeding, alternatives have existed for centuries. Feeding vessels dating back to 2000 BC have been uncovered and clay vessels were found in the graves of Roman infants from the first to the fifth century AD. However, there was little mention of artificial feeding at those times. It has been suggested that this would have been because non-breastfed babies would have been fed unmodified animal milk and so little advice was needed on its preparation. At the same time wet nursing was very popular. In

fact this practice was so popular in Roman times that writers warned against it and attempted to encourage mothers to breastfeed their own infants (Wickes, 1953a).

Over the years that followed, there was much written advice on the selection of an appropriate wet nurse (Wickes, 1953a). Wet nurses were mothers who breastfed another mother's infant, usually because the infant's own mother was unable, or did not wish, to breastfeed. The practice of wet nursing was originally a communal and supportive act, which also saved the lives of babies whose mother had died. Later, wet nurses were mothers from lower social groups who were paid or coerced to breastfeed the children of noblewomen. They would breastfeed the upper class baby in addition to, or in place of, their own baby who had died or stopped breastfeeding. This offered relatively good employment for young women. However, as job opportunities improved wet nursing became unpopular and was eventually replaced by the modern day equivalent, the milk bank. The first milk bank was set up in Boston in 1910 (Fildes, 1986).

Feeding patterns which are still popular today such as artificial feeding, discarding of colostrum, feeding routines, timing of feeds, supplementation of breastfeeding and early weaning, can be traced back through many centuries of childcare and paediatric advice. The fact that these practices persist to this day, despite evidence of their detrimental effect on breastfeeding and infant morbidity, is illustrative of the strength of medical influence (Palmer and Kemp, 1996).

Back in the second century BC, there was advice in Indian writings about expressing and discarding of colostrum while the baby was fed on honey and clarified butter for the first four days. Soranus (a writer from the second century AD) recommended that colostrum should not be fed to the new-born. By the 17th century, mothers were still being advised not to breastfeed immediately after birth but to avoid it for a period of eight days to one month (Wickes, 1953b).

Timing of feeds and restricting feeding was used historically to "treat" ill health. In the 12th century AD there was mention of overfeeding causing illness in the infant. Later, in the 15th century, diarrhoea and vomiting were blamed on overfeeding, and thick milk was thought to cause constipation (Wickes, 1953a). Pemell, a GP in Kent in 1653, advised as a cure for vomiting that the infant should feed less often and for a shorter time (Wickes, 1953b).

Demand feeding was encouraged by the French physician, Guillemeau, in the 17th century but in the 18th century the influential paediatrician, William Cadogan, advised strict feeding regimes of "four feeds in 24 hours" and "forbade nightfeeding" (Palmer and Kemp, 1996). The regulation of feeds was increased in the 19th century to 10 feeds in 24 hours in an attempt to reduce gastro-enteritis. However in the early 20th century Truby King, a paediatrician from New Zealand, suggested that frequent feeding may result in overfeeding (Wickes, 1953c).

1:1:1. History of breastfeeding in Britain

In Britain before the Industrial Revolution, the unit of production was the home, where childbirth and breastfeeding were part of the normal working environment and most babies were breastfed by their own mothers. However, many upper class women chose to employ wet nurses. The belief at this time was that noblewomen were too delicate to breastfeed. Moreover, the hiring of a wet nurse was often a demonstration of the high status of the family (Palmer, 1993).

Colostrum's nourishing affects became recognised in the early 18th century and mothers were encouraged to feed it to their own babies. The mother benefited as early breastfeeding prevented engorgement, mastitis, abscesses and milk fever which at that time often had fatal consequences. It also helped to expel retained fragments of placenta. Mothers were encouraged to begin breastfeeding within 24 hours of their baby's birth and so maternal breastfeeding became popular amongst the upper classes once again (Fildes, 1986).

The Industrial Revolution progressed and production moved from the home into the factory. This new structure of labour did not support breastfeeding, since mothers were unable to take their babies to work. The changes in society during the industrial revolution tended to isolate mothers as they moved to the cities and lost the support and knowledge of female relatives (Palmer, 1993). At the same time lack of medical knowledge about breastfeeding and the availability of products promoted as adequate breastmilk substitutes resulted in variations in the frequency and duration of breastfeeding (Wickes, 1953b). The practice of supplementing breastfeeding with cows' milk began to become more widespread throughout Europe. Generally, however any production of cows' milk for infants continued to be a home based process (WHO, 1981a).

The breastfeeding rate began to decline more noticeably in the early 20th century and continued to do so until the 1960s. Untreated milk supplied from milk depots was required to be kept fresh, but this was impossible in most homes which were ill-equipped and over-crowded (Gray, 1975), resulting in a higher mortality rate among bottle-fed babies (Howarth, 1905; Robinson, 1951; Herbert, 1979). In the 1920s, in spite of the recognised harmful effects and no known nutritional advantage, cows' milk based artificial feeds became available to those who could afford it. Pasteur's discovery of the fermentation process and the subsequent knowledge of microbiology brought about a revolution in food hygiene and preparation as well as improvements in sanitation, water facilities and the process of food preservation (WHO, 1981a). Thus by the late 1930s preparation of infant feeds had moved from the kitchen into the factory (Darke, 1988). Knowledge of microbiology also created new fears about personal hygiene. This resulted in mothers being advised to scrub their breasts with soap or surgical spirits before breastfeeding. The resulting sore and cracked nipples had disastrous consequences for breastfeeding (Palmer, 1993).

During World War II, in an attempt to improve the health of the nation, the Government began to produce *National Dried Milk,* which was made available at low cost to all nursing mothers or free to those in financial hardship. This was the first time that a cheap substitute for human milk was available for everyone (Darke, 1988).

Around this period, great social changes were occurring. Large extended families became less popular in favour of the small nuclear family, with the subsequent loss of supportive relatives. As women were offered more opportunities in education and employment their roles changed and they began to work outside the home and to have greater social freedom (WHO, 1981a). Artificial feeding seemed to free women from 'endless' breastfeeding and allowed more time for other activities.

Following the end of the Second World War, health professionals became more involved in perinatal care as women were encouraged to give birth within the hospital. The health professionals' disinterest in breastfeeding combined with powerful advertising promoting a growing variety of artificial milks all served to undermine breastfeeding. Health professionals became associated with baby milk manufacturers by accepting sponsorship

and funding, e.g. the British Paediatric Association has accepted funding from milk companies since 1920 (Palmer and Kemp, 1996).

Other factors such as the increasing popularity of technology (where science appeared to be superior to nature) and a change in attitude to sexuality (breasts were seen as having more of a sexual than a nourishing function) contributed to the decline in breastfeeding at this time (Box 1).

Box 1 - Changes in society having an adverse effect on breastfeeding in Britain: 1945-1960 (see text)

- Altered social structure
- Changed role of women
- Hospitalisation of births
- Health professionals' attitudes to breastfeeding
- Increased number, variety and safety of infant foods
- Advertising
- Increase in technology
- Change in attitude towards breasts

Until the 1960s, the decline in breastfeeding was generally accepted as a fact of modern life and artificial feeding was often encouraged. In Britain before the 1970s there was no national survey of infant feeding practices and statistics are hard to obtain, but by the 1970s there was a generation of bottle-feeding mothers who had been bottle-fed themselves and who had never seen a baby breastfed. Science and technology were losing their appeal however, and the number of women choosing to breastfeed increased. In addition, a number of articles appeared in scientific and medical journals concerning the ill health of bottle-fed babies. Metabolic disturbances, especially hypernatraemia and hypocalcaemia (which can cause neonatal convulsions), were reported (Jelliffe, 1977). A higher incidence of infections, in particular diarrhoeal disease (Goldman & Smith, 1973; Jelliffe, 1977), asthma (Blair, 1977) and allergies (Saarinen *et al.*, 1979) was noted in artificially fed babies. Concerns were expressed about artificial feeding and ulcerative colitis (Whorwell, 1979). There was also anxiety about possible long term unknown effects, e.g.: arteriosclerosis, hypertension, allergy, obesity and the lack of skin-to-skin contact thought to be essential for bonding

(Jelliffe, 1977). Finally, manufacturing errors in the development of artificial milks gave cause for concern (Mackeith and Wood, 1977; Minchin, 1987).

Box 2 summarises the health hazards associated with bottle-feeding at this time.

Box 2 - Health hazards to bottle-fed babies (see text):

- Metabolic disturbances
- Higher incidence of infections
- Allergies
- Manufacturing errors
- Possible long term effects
- Lack of bonding

By the 1980s numerous scientific and medical papers had been published exploring the nature of human milk and its health benefits for the developing infant. As more organisations (e.g. the World Health Organisation (WHO), the United Nations' Children's Fund (UNICEF)) became aware of these benefits the promotion of breastfeeding became an important part of perinatal care.

Research in the 1990s has continued to uncover previously unknown factors regarding breastfeeding and human milk and this has encouraged even greater interest in breastfeeding and the urgent need to promote it. In spite of this, however, the prevalence of breastfeeding continues to decline in many countries of the world.

1:2. The nature of human milk

As human milk was investigated it was discovered to be an increasingly complex substance. It contains many live cells and is believed to provide all the nutrients the baby needs for optimal growth and development. The composition of the milk varies within a feed, from one feed to the next, between breasts and from one woman to another all depending on the needs of her baby at that particular time. As the baby grows, the composition also alters to keep up with his growth. It is therefore very difficult to study human milk and its

composition. In spite of these difficulties, research has shown the clear benefits of breastfeeding (Williams, 1994).

The interaction of nutrients and other elements in human milk enhances the infant's nutritional and developmental status. These elements must be able to be absorbed and utilised by the growing infant. *Transfer factors* in human milk allow some elements such as iron, zinc, folic acid and vitamin B12 to be absorbed efficiently. The iron in artificial milk although more plentiful, is poorly absorbed and instead is available to gut bacteria resulting in the growth of potentially pathogenic bacteria. *Enzymes* in human milk are essential for digestion of the milk, e.g. the enzyme lipase assists the digestion of fats in the infant's mouth and stomach. *Growth factors* in human milk may be important in the differentiation and proliferation of infant tissues. In addition there are a number of hormones present in human milk such as thyroxin, calcitonin, erythropoietin and prostaglandins. These hormones are also thought to be important for the growth and differentiation of the infant's tissues and organs (Inch, 1996). The endocrine response of the infant to the first feeds differs between infants fed human milk and those fed artificial milk. The different composition of feeds influences the release of hormones and thus affects the circulating concentrations of metabolic fuels and their utilisation (Aynsley-Green, 1983).

Absorbed nutrients, minerals, trace elements and vitamins are used in the development of cells, tissues and organs and it is essential that these are appropriate for the function expected of them. For example, the long chain fatty acid, docosahexaenoic acid (DHA), found ready synthesised in human milk, is non-existent in most artificial milks. DHA is essential in forming the neuronal membranes, retinal photoreceptors and the myelin sheath during the first year of life (Cockburn *et al.*, 1993; Cockburn, 1994).

Usually, a non-breastfed infant will be given cows' milk that has been modified to make it more suitable for the human baby. The final product bears little similarity to cows' milk and is grossly different in composition from human milk (Minchin, 1987). This difference in composition has an effect on the baby, for instance the whey:casein ratio affects the level of plasma cholesterol (Jelliffe and Jelliffe, 1978) and Hambraeus (1977) suggested that the lower mineral content of breastmilk was more appropriate for the immature infant kidney.

It should be remembered that breastmilk is designed to *optimise* the growth of the infant while artificial milk *maximises* it. It takes a human 180 days to double his birth weight while the cow (the supplier of infant formula) takes just 47 (Hambraeus, 1977). Research by the WHO Working Group on Infant Growth demonstrated differences in growth between breastfed and bottle-fed babies. Compared to the accepted standard, breastfed infants grew more rapidly in the first few months but less rapidly from 3-12 months. In particular, breastfed babies were lighter than expected for their age or length. However the head circumference of breastfed babies was greater than expected during the first year (Dewey *et al.*, 1995).

1:3. Health benefits of breastfeeding

It is now widely accepted that human milk is healthier than formula or cow's milk for both the baby and the mother. Lack of breastfeeding is estimated to result in 1.3 million infant deaths each year (Reid, 1993).

Human milk has well recognised anti-infective properties. It can actively inhibit and destroy many bacteria, viruses, fungi and parasites (Minchin, 1987). Lysozymes in human milk have a direct bactericidal effect and also enhance the activity of antibodies (Hambraeus, 1977).

The anti-infective properties of breastfeeding are more striking in developing countries (Sazawal *et al.*, 1992). Recent research in Scotland, however, found that breastfeeding protected babies from gastro-intestinal infection (Howie *et al.*, 1990). The incidence of other infections such as respiratory infections (Howie *et al.*, 1990; Pisacane *et al.*, 1994; Wilson *et al.*, 1998), otitis media (Duncan *et al.*, 1993) and urinary infections (Pisacane *et al.*, 1992) was also found to be reduced in breastfed babies. Lucas and Cole (1990) demonstrated that preterm babies who did not receive breastmilk were six to ten times more likely to suffer from necrotising enterocolitis (NEC) than babies who received breastmilk. NEC is a rare but serious condition affecting the small intestine that is fatal in about a quarter of cases.

Breastfeeding has been shown to enhance the active immune response in the first year of life (Pabst and Spady, 1990). Other suggested health benefits associated with breastfeeding in developed countries include reduced incidence of Sudden Infant Death Syndrome (Mitchell

et al., 1991) and reduced incidence of atopic disease where there was a family history (Chandra, 1979; Lucas *et al.*, 1990b; Saarinen *et al.*, 1995). Possible long term benefits for breastfed infants include reduced incidence of insulin dependent diabetes (Borch-Johnson *et al.*, 1984; Mayer *et al.*, 1988), possible reduced incidence of non-insulin dependent diabetes (Pettitt *et al.*, 1997), protection from certain cancers (Davis, 1988), including leukaemia (Greaves, 1997) and reduced incidence of Crohns disease and ulcerative colitis (Whorwell *et al.*, 1979; Koletzko *et al.*, 1989). Early studies suggested that breastfed pre-term infants may have higher IQ and developmental status at 18 months than artificially fed babies (Lucas *et al.*, 1990a). Later, this advantage was also observed in term babies (du Florey *et al.*, 1995). Other studies have recorded enhanced neuro-development (Lucas *et al.*, 1992; Morley *et al.*, 1988; Makrides *et al.*, 1993; Cockburn *et al.*, 1993) and reduced incidence of psychomotor delay (Barros *et al.*, 1997), while nine-year-old children appeared to have improved neurological development if they had been breastfed for at least three weeks (Lanting *et al.*, 1994). Improved neurodevelopmental performance was also noted for babies with phenylketonuria if they were breastfed rather than bottle-fed prior to diagnosis (Riva *et al.*, 1996). Breastfeeding may affect serum cholesterol level (Kolacek *et al.*, 1993; Fall *et al.*, 1992) and may possibly offer protection against obesity and some circulatory diseases (Cunningham *et al.*, 1992). A study which followed-up a cohort of children for seven years, demonstrated significantly lower systolic blood pressure among children who had been breastfed compared to their bottle-fed counterparts (Wilson *et al.*, 1998). Marmot *et al.* (1980) found that serum cholesterol was reduced in young women who had been breastfed as infants. In terms of dental health, breastfeeding may offer protection from dental caries and malocclusion (Tank and Storvick, 1965).

The special bond thought to exist between a breastfed baby and its mother has been cited as a reason to breastfeed (McIntosh, 1985; Cassidy, 1992). Historically, this bond was recognised to exist between wet nurses and their charges making it important to select a wet nurse of good character (Wickes, 1953a). It is unknown whether the bond is related to human milk or to the act of breastfeeding. In an American study mothers who were breastfeeding commented on feeling closer to the children they had breastfed and that the breastfed baby felt "special" (Locklin and Naber, 1993). There appears to be very little research exploring this issue.

In addition, breastfed babies are thought to be less at risk of nappy rash, to be easier to wean and have less offensively smelling stools.

The suggested benefits for the baby are summarised in Box 3.

Box 3 - Suggested health benefits of breastfeeding for the baby

- Reduced incidence of infection
- Reduced incidence of Sudden Infant Death syndrome
- Reduced incidence of necrotising enterocolitis (NEC) in pre-term babies
- Reduced incidence of atopic disease
- Reduced incidence of diabetes
- Enhanced neuro-development
- Reduced incidence of certain cancers
- Reduced incidence of Crohns disease and ulcerative colitis
- Reduced blood pressure
- Possible protection against obesity and some circulatory diseases
- Improved dental health
- Enhanced infant-maternal bonding

Recent research demonstrated that the benefits of breastfeeding were related to the amount of human milk consumed by the infant (Lucas and Cole, 1990) and to the duration of breastfeeding (Howie *et al.*, 1990).

The development, manufacturing and supply of infant formula has considerable financial implications for families and society as a whole. In a climate of dwindling natural resources it is wasteful that a nutritious foodstuff which enhances development, prevents disease and is freely available should be discarded and replaced with a costly substance which is wholly inferior (Palmer, 1993).

In financial terms, it has been estimated that treating babies suffering from gastrointestinal illness caused by lack of breastfeeding could cost the NHS in Scotland over £3M a year (Broadfoot, 1995). This contrasts with the cost of human milk which is, of course, free.

Breastfeeding can also have a beneficial effect on the mother. Historically, it prevented milk fever and expelled fragments of placenta. These diseases are less significant in a modern society where antibiotics are available but there is growing evidence for other possible long-term benefits of breastfeeding. Pre-menopausal breast cancer (Chilvers, 1993; Newcomb *et al.*, 1994) and ovarian cancer (Gwinn *et al.*, 1990) may be reduced in mothers who have breastfed. It appears that the longer the mother breastfeeds, the greater the protection. Mothers who have breastfed may have some protection in later life from osteoporosis (Aloia *et al.*, 1985) and hip fracture (Cumming *et al.*, 1993). Death from rheumatoid arthritis has been shown to be lower among women who have breastfed (Brun, 1995).

Birth spacing resulting from demand breastfeeding has been accepted as a reliable contraceptive in some societies for many years. Ninety-eight percent of women with lactational amenorrhoea who were fully breastfeeding their babies were protected from pregnancy for up to six months postnatally (Kennedy and Visness, 1992). Most modern contraceptives also offer a protection rate of 98%.

Breastfeeding may also empower women (Locklin and Naber, 1993) and a successful breastfeeding experience may improve a woman's self-esteem.

The benefits for the mother are summarised in Box 4.

Box 4 - Suggested benefits of breastfeeding for the mother

- Reduced incidence of certain cancers
- Reduced serum cholesterol
- Lactational amenorrhoea
- Protection from osteoporosis and hip fracture
- Improved self esteem
- Enhanced maternal infant bond

1:4. Disadvantages of breastfeeding

In the immediate postnatal period, breastfed infants appear to be at greater risk of developing jaundice and of increased weight loss. A study in Japan showed that these problems could be avoided by frequent suckling (Yamauchi and Yamanouchi, 1990). The

breastfed neonate also appeared to be more susceptible to hypoglycaemia. However, guidelines published by the WHO indicated that this was an iatrogenic complication which could be avoided with proper knowledge and management of breastfeeding (WHO, 1997).

Due to the very low concentrations of vitamin K in human milk, breastfeeding is a risk factor for late haemorrhagic disease of the newborn, a rare condition that may result in long term neurological disability. A programme of prophylaxis in developed countries prevents haemorrhagic disease but in less developed countries, breastfed babies are at increased risk of death and disability from this cause (Victora *et al.*, 1998).

Mothers who are HIV positive may transfer the virus to their baby if they breastfeed (Dunn *et al.*, 1992). The WHO (1992) recommends that if there is a "safe alternative", babies should not be breastfed if the mother is known to be HIV positive. However, recent research suggested that babies breastfed for a short period of time (about six months) were protected from becoming sero-positive by the maternal antigen. This study recorded similar risks for developing HIV in babies breastfed for a short term and babies who were bottle-fed. Babies breastfed for more than six months had a much greater risk of becoming sero-positive (Takezaki *et al.*, 1997). In developing countries the risks of not-breastfeeding may outweigh the risks of short-term breastfeeding. A study of available data demonstrated that there were fewer adverse outcomes in babies who were breastfed for three months or less compared to those who were breastfed for more than three months (Kuhn and Stein, 1997).

Other viruses and bacteria can be transferred in varying degrees in breastmilk. Hepatitis B may be transferred in breastmilk and if a mother is known to be infected her baby should be immunised to allow breastfeeding to continue without interruption (La Leche League, 1991). Hepatitis C antibodies and Hepatitis C ribonucleic acid have been isolated in the colostrum of infected mothers but hepatitis was not transmitted to the infant by breastfeeding in the first year of life (Lin *et al.*, 1995).

Human cytomegalovirus has been isolated in breastmilk at approximately one month after delivery, but less frequently from colostrum or early breastmilk. This virus is the most common cause of congenital and perinatal infections throughout the world (Numazaki, 1997).

The bacterium responsible for Toxic Shock Syndrome (a strain of staphylococcus aureus) can be harmful to the baby. The milk of infected mothers should be tested and the baby weaned until it is free of contamination (La Leche League, 1991).

Diseases spread by contact can be minimised by reducing contact between mother and baby. If necessary, the mother can express her breast milk for her baby. Mothers who have active herpetic lesions on their breasts are advised not to feed from the affected breast (La Leche League, 1991).

Breastfed babies are also susceptible to chemicals and drugs to which the mother is exposed. In the case of most prescribed drugs there are often safe alternatives. However, some environmental chemicals which accumulate in the mother's body and in her milk may prove harmful to the baby. Polychlorinated biphenyls (PCBs) and dioxins are widespread environmental pollutants that are neurotoxic in animals (Huisman *et al.*, 1995). Since the breastfed baby is at the highest level in the food chain, he will consume the most concentrated amount of PCBs and dioxins in his diet. These chemicals have been linked to disturbed cognitive development and delayed motor development (Koppe, 1995). A Dutch study showed that pre- and postnatal exposure to PCBs and dioxins influenced the foetal and neonatal immune system (Weisglas-Kuperus *et al.*, 1995). In 1997, a message from the Chief Medical Officer (for England) regarding dioxins and PCBs stated that "the proven benefits of breast feeding far out-weigh any small theoretical risk from these chemicals" (CMO, 1997).

Recreational drug abuse may have severe consequences for the neonate. Cocaine, heroin and marijuana are all secreted in breastmilk. Cocaine is neurotoxic and may cause irritability and convulsions in the neonate. Heroin can result in addiction and marijuana has been found to cause structural changes in the brain cells of animals (Wilton, 1992).

Some maternal conditions such as renal disease may be made worse by breastfeeding. Other maternal conditions may make breastfeeding more problematic; for instance, although breastfeeding is anti-diabetogenic, the breastfeeding diabetic mother is more at risk of thrush and requires prompt action in the event of blocked ducts or mastitis. In the event of ketosis, acetone is secreted in breastmilk and may cause hepatomegaly in the infant (Asselin, 1987).

There are several illnesses and discomforts to which the breastfeeding mother is more susceptible. She is more likely to suffer from mastitis, which, if not managed properly, can result in a breast abscess. She may suffer discomfort from engorgement. In the early days while breastfeeding is being established she may also suffer from sore or cracked nipples. Other mothers may feel inconvenienced because breastfeeding can be messy and, particularly in the early weeks, leakage of milk may be restricting or embarrassing.

Although the majority of breastfeeding mothers do not have to alter their diet while breastfeeding, some infants may be affected by certain elements in the maternal diet. In particular caffeine can cause babies to be irritable (Clement, 1989). Alcohol accumulates in breastmilk and may cause sleepiness or irritability. Other substances thought to affect some babies include chocolate, some types of vegetables, aerated drinks, spicy foods and dairy products. Breastfeeding mothers are also advised to avoid peanuts as this may result in an increased risk of the baby developing peanut allergy. Dietary restrictions may prove unacceptable for some mothers.

Since the responsibility for nourishing the baby rests entirely with the mother, mothers who are returning to work or who enjoy an active social life may feel restricted. To enable breastfeeding to continue, the working day may be changed to suit the baby or breastmilk be expressed and fed to the baby by someone else. Expressing breastmilk can be very time consuming.

The disadvantages of breastfeeding are summarised in Box 5.

Box 5 - Suggested disadvantages of breastfeeding

For the baby:

Increased risk of haemorrhagic disease

Increased risk of infection from maternal viruses and bacteria

Exposure to drugs and chemicals which may accumulate in breastmilk

For the mother:

Deterioration in some chronic maternal disease

Increased susceptibility to engorgement, mastitis and abscess

Possible dietary restrictions

Possible restrictions in social and working life

1:5. Factors affecting the choice of infant feeding

Despite the well known risks, around 40% of mothers in the UK chose to bottle-feed their babies in 1995 (Foster *et al.*, 1997).

The reasons women choose to feed their babies in a particular manner are highly complex. The decision is related to belief systems established during childhood, adolescence and adulthood. Beliefs about breastfeeding are related to knowledge and to the beliefs and behaviour of the family and the peer group. Personal motivation will determine whether a mother will choose to breastfeed and will, to some extent, determine the success or failure of the chosen behaviour.

Generally, older women from more advantaged backgrounds who have completed secondary or tertiary education and who are non-smokers are more likely to want to breastfeed. Younger, less well educated women from disadvantaged areas, who smoke are least likely to want to breastfeed (Bacon & Wylie, 1976; Bloom *et al.*, 1982a; White *et al.*, 1992; Foster *et al.*, 1997).

Most women have decided how they will feed before they are pregnant (Hally *et al.*, 1984; Dix, 1991; White *et al.*, 1992; Foster *et al.*, 1997). Research shows that family and friends have a great influence on feeding intention and behaviour (Foster *et al.*, 1997). Women whose mothers strongly support breastfeeding appear more able to resist peer pressure to bottle-feed. Conversely, grandmothers can encourage bottle-feeding or undermine a new mother's confidence in her ability to breastfeed (Bryant *et al.*, 1992). A positive role model has been shown to be important and women who were breastfed themselves or who have been in contact with breastfeeding mothers were more likely to breastfeed (Coles *et al.*, 1978; Salariya *et al.*, 1980; Hally *et al.*, 1984; Foster *et al.*, 1997). A negative breastfeeding experience affecting friends or family can act as a disincentive (Dix, 1991; Wright, 1993).

Bryant (1992) also identified different influences depending on others present in the household. For instance, the partner will have a greater influence if he lives with the new mother. In addition, the person having the greatest influence on feeding varied according to ethnic group. The support of a close friend was most important among black Americans, while among Mexican-Americans it was the mother's mother, and among Anglo-Americans

the male partner who had the greatest influence on a woman's experience of infant feeding (Baranowski *et al.*, 1983). Bryant (1982) found that Anglo subjects viewed their husband or friends as having the greatest influence on feeding decisions, while for Puerto Ricans and Cubans the mother was the main influence.

An American study of (predominantly white) expectant fathers demonstrated a more positive attitude to breastfeeding where the partner was planning to breastfeed (Freed *et al.*, 1992)

School pupils demonstrated a more positive attitude to breastfeeding if they had seen a baby being breastfed (Gregg, 1989). However, teenagers may have already developed strong feelings about feeding which might not be associated with their knowledge of the benefits (Purtell, 1994).

In a survey of attitudes of college students, although 82% believed breastfeeding was the best way to feed a baby, only 17% stated that they thought they would choose to breastfeed (Ellis, 1983).

Attitude to breastfeeding and the choice of feeding may be associated with the mother's feelings about the pregnancy. Women whose pregnancy was unplanned were significantly less likely to intend to breastfeed than women who had planned their pregnancy (Dye, 1997).

Another important influence is previous experience. In a British survey, 91% of women who had previously breastfed stated that they would breastfeed a subsequent baby compared to only 18% of women who had initially bottle-fed. Previous experience had a very strong effect on choice of feeding in parous women and displaced other influences such as socio-demographic factors and how she herself had been fed. Birth order also appears to have an affect, with first babies being more likely to be breastfed than subsequent children (Foster *et al.*, 1997).

Health professionals appear to have limited influence over a mother's choice of feeding (Bryant, 1982; Baranowski *et al.*, 1983; White *et al.*, 1992). The Best Start programme (a social marketing approach to promote breastfeeding to low income women) found that peers were more persuasive than health professionals or celebrities when promoting

breastfeeding as they provided a role model which gave mothers the confidence to breastfeed (Bryant *et al.*, 1992).

1:6. Factors affecting the duration of breastfeeding

Once a woman has decided to breastfeed, factors in her immediate environment as well as her socio-economic background affect how long she will breastfeed. Duration may also be influenced by her personality and by the people in her social support network.

Events surrounding birth and during the first few days in hospital have a great impact on the success or failure of breastfeeding. In particular, events associated with labour and delivery can affect initiation and duration of breastfeeding. Babies of mothers who have received narcotic pain relief may be more sedated and thus have greater difficulty fixing and feeding at the breast (Rajan, 1994). While some authors indicate that mothers delivered by caesarean section are more likely to give up breastfeeding before six weeks (Bruce, 1991), other authors have found no relationship between type of delivery and feeding (Foster *et al.*, 1997).

A number of hospital practices have been found to be unsupportive of breastfeeding and may reduce the duration of breastfeeding or result in its failure in the first few days. These include delaying the first feed (Salariya, 1978; Fisher, 1986; Feinstein *et al.*, 1986; Buxton *et al.*, 1991), giving formula supplements during the hospital stay (Murdaugh and Miller, 1972; Loughlin *et al.*, 1985; Feinstein *et al.*, 1986; Michaelsen *et al.*, 1994; Blomquist *et al.*, 1994), separating mothers and babies (Mobbs, 1973; Buxton *et al.*, 1991), interfering with demand feeding (Mobbs, 1973; Howie *et al.*, 1981; L'Esperance, 1985) and the use of nipple shields or dummies (Auerbach, 1990a). The provision of formula samples on discharge remains controversial. A number of studies associated the provision of formula samples on discharge with a shorter duration of breastfeeding (Bergevin *et al.*, 1983; Frank *et al.*, 1987; Dungy *et al.*, 1992). However, other studies have shown no association between breastfeeding duration and discharge formula samples (Feinstein *et al.*, 1986; Dungy *et al.*, 1997).

The effect of length of hospital stay on breastfeeding is unsubstantiated. A national audit in Scotland demonstrated that increased hospital stay resulted in increased duration of breastfeeding (Elton, 1993), whereas shorter hospital stays have also been associated with

increased breastfeeding success (Emery, 1990; Hawthorne, 1994). Two other studies, one in America and one in Sweden, found no association between length of hospital stay and breastfeeding duration (Quinn *et al.*, 1997; Kvist *et al.*, 1996).

The attitude and knowledge of health professionals (Winnikoff, 1988; Waterston and Davies, 1993) and the confusion caused by conflicting advice (Bruce, 1991) also appear to exert an important effect on the mother's confidence and ability to breastfeed. In particular the midwife (McKnight, 1987; Wright, 1993) and the health visitor appear to have the greatest influence (Dracup and Sanderson, 1994).

Hospital practices that have been reported to be unsupportive of breastfeeding are summarised in Box 5:

Box 6 - Hospital practices that may negatively affect breastfeeding

- Giving supplements
- Separating mothers and babies
- Interfering with demand feeding
- Use of nipple shields or dummies
- Provision of formula samples at discharge
- Conflicting advice

Hospital practices that are supportive of breastfeeding are embodied in the "Ten Steps to Successful Breastfeeding" (Appendix 1).

Factors relating to the mother's background appear to have an important effect. Maternal smoking and a low level of education (Martin and White, 1988; Michaelsen, 1994) (Goodine and Fried, 1984; Martin and White, 1988) are both associated with a shorter duration of breastfeeding. Women who stop breastfeeding prematurely are unlikely to have previous breastfeeding experience (Martin and White, 1988). Returning to work or worries about returning to work can affect the duration of breastfeeding (Ekwo *et al.*, 1984, O'Campo, 1992).

An American study, which assessed a number of socio-demographic variables and attitude measures, demonstrated that the maternal perception of "ease of feeding" was the only

significant predictor of whether a baby was exclusively breastfeed during the study period. "Ease of feeding" was also associated with a longer duration of some breastfeeding (Dungy *et al.*, 1992).

The personality of the mother herself may have an effect on her ability to breastfeed successfully (Rentschler, 1991). A mother's confidence in her ability (Loughlin *et al.*, 1985; Buxton *et al.*, 1991, O'Campo, 1992), her attitude to breastfeeding (Jones and West, 1985; Hill, 1991) and the certainty of her decision to breastfeed also affect duration (Buxton *et al.*, 1991).

A number of studies that attempted to increase the duration of breastfeeding demonstrated that actual duration was significantly associated with the intended duration (Hauck and Dimmock, 1994; Schy *et al.*, 1996).

The attitude of a "significant other" is important and their lack of support has been cited as a reason for breastfeeding failure (Wiles, 1984). Those who have been previously supportive of breastfeeding may encourage weaning by becoming silent or withdrawing support. Later, weaning may be positively encouraged (Morse and Harrison, 1987).

In a study of home support for the breastfeeding mother, there was a marked difference in continuance between social class I (over 80% of those who started feeding were still breastfeeding at 24 weeks) and social classes III and IV (only 56% were breastfeeding at 24 weeks). This difference was unlikely to be physiological but probably related to home environment (Houston and Howie, 1981).

Studies that ask the mother why she stopped breastfeeding prematurely, regularly cite poor milk supply as perceived by the mother to be the main reason (Bacon and Wylie, 1976; Goodine and Fried, 1984; Graffy, 1992; Lowe, 1994; Robertson and Goddard, 1997). It is unclear whether this reflects a genuinely inadequate milk supply, an unsettled baby or a lack of adequate preparation for the reality of breastfeeding. Unsupportive hospital practices (see Box 5) may indeed result in poor milk supply for some mothers. Other reasons given by mothers for discontinuing breastfeeding include sore nipples (Lowe, 1994; Robertson and Goddard, 1997) and dislike of breastfeeding (Lowe, 1994).

Finally, the baby himself may influence the outcome of breastfeeding. Loughlin *et al.* (1985) found that breastfeeding outcome was related to the nursery staff's perception of the baby in particular how much he cried, his personality, whether there was difficulty with feeding or likely to be future difficulty with feeding. This was supported in a study by Wiles (1984) where the majority of a control group who did not succeed in breastfeeding cited the baby being a "poor nurser" as the main reason for giving up. In listing reasons for stopping breastfeeding mothers may report "unsatisfied baby" (Robertson and Goddard, 1997) or "colicky" (Lowe, 1994).

1:7. The epidemiology of breastfeeding

1:7:1. Breastfeeding world-wide

The WHO estimates that around 95% of all women in the world are physiologically capable of breastfeeding (WHO/UNICEF, 1989). However, despite its well-publicised advantages, breastfeeding has declined in many parts of the world. In the 1990s some industrialised countries have recorded small but steady increases in the rates of breastfeeding. The Baby Friendly Hospital Initiative was launched in 1991 to overcome the barriers to successful breastfeeding that exist in many health care facilities around the world.

Although the majority of babies in developing countries are breastfed in the early months, feeding practices vary considerably from country to country and there is evidence of western feeding practices (i.e. bottle-feeding, early supplementation and early weaning) spreading to these countries. In addition, actions such as discarding colostrum, giving pre-lacteal feeds, powerful advertising and the promotion of breastmilk substitutes in the health care setting have all contributed to the decline in breastfeeding. In developing countries, breastfeeding decreases as socio-economic status improves (Baumslag, 1992). For affluent urban families the bottle symbolises a modern twentieth century way of life while breastfeeding is considered old-fashioned, low class and inconvenient.

In developing countries, bottle-feeding often takes place where there is a poor water supply and where families are unable to read the instructions on the tin. Breastmilk substitutes are costly, thus they are often diluted to make them last longer. Under these circumstances, the

risk of death for bottle-fed infants is 10-15 times greater in the first three to four months than for babies who are exclusively breastfed (Grant, 1992).

Statistics for individual countries are not routinely published, thus comparisons are difficult to make. It is known that breastfeeding varies considerably between different countries and between rural and urban or affluent and deprived populations within the same country.

Breastfeeding is practised widely in many African countries, often into the second year of life. In Botswana breastfeeding declined from 98% to 91% between 1984 and 1988 (Morewane, 1996). In Namibia in 1991, 97% of children under six months were breastfed (Viljoen and Amadhila, 1996).

A study in Myanmar revealed that 99.9% of mothers in a peri-urban area breastfed but that only 4.5% were exclusively breastfed at five months (Mya and Myint, 1996).

In developed countries the incidence and prevalence of breastfeeding also varies widely.

Breastfeeding in Australia reached its lowest during the 1960s and early 1970s, mainly due to unsupportive hospital practices. In 1996, 75% of mothers in Victoria breastfed their babies at hospital discharge with 53% continuing to three months and 39% to six months. Breastfeeding in Australia is part of the public policy agenda and its superiority is universally acknowledged (Murray, 1996b).

In America, the Ross Laboratories monitor breastfeeding by mailing a questionnaire to a representative sample of mothers when their infants are six months old. Data collected between 1984 and 1989 revealed a decline in both the initiation and the duration of breastfeeding. However, data collected between 1989 and 1995 demonstrated increases in the initiation and duration of breastfeeding. Although these increases were seen across all socio-demographic groups, increases were greater amongst the groups who previously tended not to favour breastfeeding. It was suggested that the improvements in the WIC (Women, Infants and Children) Food Supplemental Program (provides foodstuffs to breastfeeding mothers or infant formula) had had an impact on breastfeeding among low-income mothers. Variations in breastfeeding in America were related to income, education, age, ethnic group, and region of residence (Ryan, 1997).

Even within Europe there are tremendous differences in breastfeeding prevalence. The best breastfeeding rates are recorded in the Scandinavian countries but this has not always been the case. Data collected from 1860 to 1980 in Norway demonstrated that over 80% of babies were breastfed at one week. However between 1920 and 1960 the continuance of breastfeeding fell dramatically to a low of less than 50% of babies being breastfed at three months. Improvements in the health care system and government support resulted in almost 80% of babies being breastfed at three months in 1980 (Austveg and Sundby, 1995). Data for 1985 reveal that 95% of mothers are breastfeeding at hospital discharge and in 1984 between 60-90% of babies were breastfed over three months (Helsing, 1990). Studies carried out in Sweden between 1944 and 1970 revealed a steep decline in initiation and duration of breastfeeding. In 1944, 69% of babies were breastfed at four months but by 1970 this had fallen to 17% (Vahlquist, 1975). However, in 1987 97% of Swedish babies were breastfed at discharge from the maternity ward and 56-66% were breastfed at four months. Other European countries do not fare so well. In 1985, the percentage breastfeeding at time of discharge from the maternity ward was recorded at 68% in Luxembourg and 35% in Ireland. In 1984, the percentage breastfeeding at three months in Austria, the Netherlands and Spain was 41%, 33% and 30% respectively (Helsing, 1990).

1:7:2. Breastfeeding in Britain/UK

In response to a recommendation from the Committee of Medical Aspects of Food Policy (COMA) that there should be a continuous review of patterns of infant feeding, the government began measuring the frequency of breastfeeding in England and Wales in 1975. Scotland was included from 1980 and Northern Ireland from 1990. The surveys are repeated every five years. The *incidence* is those mothers who "ever put their baby to the breast" and includes those who tried only one or two feeds. In 1995 only 66% of women in the UK ever attempted to breastfed their babies, this has not changed greatly over the past 20 years (*Table 1*). Compared to previous studies, the demographic variables of the sample of mothers selected for the 1995 survey tended to favour breastfeeding. Mothers in the 1995 sample were older, had received more years of education and fewer were classified into the manual social group when compared to the 1990 sample. The increase in incidence of breastfeeding in Britain could be accounted for by this change in sample profile. However in Northern Ireland, the increase remained significant after correcting for this (Foster *et al.*, 1997).

Table 1 - Incidence of breastfeeding (i.e. ever put to the breast)

	1975 (%)	1980 (%)	1985 (%)	1990 (%)	1995 (%)
ENGLAND & WALES	51	67	65	64	68
SCOTLAND		50	48	50	55
NORTHERN IRELAND				36	45
GREAT BRITAIN/UK		65	64	62	66

Source: White et al., 1992; Foster et al., 1997

The prevalence of breastfeeding declines sharply in the first few weeks of life. The rate of decline appears virtually unchanged since 1975: *Table 2.*

Table 2 - Duration of breastfeeding in women initiating breastfeeding in Britain, 1980-1985, UK 1990-1995

	1980 (%)	1985 (%)	1990 (%)	1995 (%)
Birth	100	100	100	100
1st week	88	86	85	85
2nd week	81	81	80	80
6th week	63	61	62	65
4th month	40	41	39	42
6th month	34	43	33	32
9th month	18	17	18	21

Source: White et al., 1992; Foster et al., 1997

1:7:3. Breastfeeding in Scotland

Breastfeeding statistics in Scotland are collected in a variety of ways. Data for the Office for National Statistics (ONS) - previously known as the Office of Population Censuses and Surveys (OPCS) - are obtained from a five yearly survey of a sample of mothers giving birth in the sample year. The mothers are followed up from the birth till their babies are nine months old. The disadvantage of this method is that the characteristics of the population sample may vary from year to year. Guthrie card data record the numbers of babies breastfeeding at approximately seven days. As the Guthrie cards are collected routinely for metabolic screening, this is an unbiased sample of the entire population. The main disadvantage of the Guthrie card method is that samples are collected at varying ages in

different hospitals and regions; for instance, in Aberdeen the data are collected on day four while in Glasgow they are collected on day seven. A low frequency of breastfeeding in one area may reflect the timing of the sample rather than breastfeeding practices. The Guthrie card method does not collect information on those combining bottle-feeding and breastfeeding as this is recorded as either breast or bottle depending on which method is used most. The Guthrie results show the OPCS/ONS results to be rather optimistic in favour of breastfeeding (Ferguson *et al.*, 1994). Data are also available through the SMR (Scottish Morbidity Record) 02 forms, which are completed at the time of discharge from the maternity hospital; the data being collated in the Information Statistics Division (ISD), Edinburgh. More recently, breastfeeding information has been recorded on the Child Health Surveillance Programme records at the ages of ten days, six weeks and eight months. Once this system is computerised, the data should be more readily available for analysis of feeding practices.

In Scotland, the breastfeeding rate at birth hovered around 50% from 1980 - 1990 (White *et al.*, 1992). However, recent data collected by the ONS show an increase of 5% in mothers initiating breastfeeding in 1995 (*Table 1*). This increase in initiation could be accounted for by the change in sample profile of the mothers in the 1995 sample.

Guthrie data show the percentage of babies receiving breast milk at approximately seven days. The large differences in breastfeeding frequency between the different cities in Scotland reflect the socio-economic characteristics of their populations (Marshall *et al.*, 1995). These routine data demonstrate a steady increase in the breastfeeding rate in Scotland as a whole. The increases in Glasgow and Edinburgh are considerable while Aberdeen and Dundee fare less well (*Table 3*).

Table 3 - Breastfeeding at approximately seven days

AREA	1990-1991 (%)	1993 (%)	1997 (%)
SCOTLAND	36	38	42
ABERDEEN	50	50	47
EDINBURGH	43	45	57
DUNDEE	38	41	39
GLASGOW	27	32	36

Source: Guthrie Card Data.

The rate of decline of breastfeeding in the first few weeks of life has remained unchanged since 1980. However, between 1990 and 1995, there was a statistically significant increase in the proportion of mothers still breastfeeding at six weeks (from 60 to 66%) (*Table 4*).

Table 4 - Duration of breastfeeding in women initiating breastfeeding in Scotland, 1980-95

	1980 (%)	1985 (%)	1990 (%)	1995 (%)
Birth	100	100	100	100
1st week	89	85	83	84
2nd week	81	79	77	79
6th week	64	60	60	66
4th month	42	45	39	45
6th month	36	36	33	35
9th month	18	20	19	24

Source: White et al., 1992; Foster et al., 1997)

1:7:4. International action to promote and protect breastfeeding

In order to collect information on the prevalence and duration of breastfeeding and the volume and composition of breastmilk, the 13th International Paediatric Congress in 1970 suggested a multinational study. This would be a basis for useful action to improve breastfeeding that would be appropriate for individual countries.

In 1974, the World Health Assembly (WHA) urged a review of the promotion of baby food and encouraged legislation where necessary. This was followed in 1979 by a meeting of the WHO and UNICEF to discuss the marketing of breastmilk substitutes. The International Babyfood Action Network (IBFAN) evolved from this meeting. In an attempt to reduce the influence of baby milk manufacturing companies on breastfeeding, the "International Code on Marketing of Breastmilk Substitutes" was approved in 1981 (WHO 1981b). Countries could adopt this either as a legal or a voluntary code. The code was clarified in 1986 to prevent free samples of artificial milk being given to hospitals.

The Innocenti Declaration was formulated and adopted by participants at the WHO/UNICEF policy makers meeting in 1990. This recognised the uniqueness and

importance of breastfeeding and called for measures to be taken to promote and protect breastfeeding with the aim of creating a breastfeeding culture. This document set targets that included Government legislation to protect breastfeeding and the adoption of the "Ten Steps to Successful Breastfeeding" (WHO/UNICEF, 1989), Appendix I. Breastfeeding rights were included in the "Convention on the Rights of the Child, 1990".

The following year, the World Alliance for Breastfeeding Action (WABA) was formed to co-ordinate the efforts of organisations involved in breastfeeding. In the same year, UNICEF launched the Baby Friendly Hospital Initiative (BFHI) which urged the implementation of the "Ten Steps to Successful Breastfeeding" (Appendix I). The BFHI was initiated in response to the low uptake of breastfeeding that was noted in the western style hospitals of the developing countries. Lack of breastfeeding in these countries greatly increased the infant mortality and morbidity rate (WHO/UNICEF, 1989).

1:7:5. National action to promote and protect breastfeeding in the UK

In 1988, in an attempt to reduce conflicting advice, the Royal College of Midwives (RCM) produced "Successful Breastfeeding" (Royal College of Midwives, 1988). This was distributed free to all midwives. During the same year, the Joint Breastfeeding Initiative (JBI) was launched in England and Wales. This was to be a co-operative effort between health professionals and lay breastfeeding support organisations to promote and support breastfeeding.

In 1991 the first targets for breastfeeding were set for England in the "Health of a Nation" policy document. This stated that "the proportion nationally of infants aged six weeks being wholly or partly breastfed be increased from 39% in 1985 to 50% or more by 2000" (Department of Health, 1991). In response to this document, the National Network of Breastfeeding Co-ordinators was established in England and Wales in 1992. The remit of this group was "to promote and facilitate breastfeeding, building on the work of the JBI". In 1995 they collaborated with the Department of Health to produce "Breastfeeding: Good Practice Guidance to the NHS" (Department of Health, 1995). This was available free from the Department of Health.

The Scottish Joint Breastfeeding Initiative (SJBI) was launched in 1991 and began auditing infant feeding practices in Scotland from 1992. The audit demonstrated the association between low breastfeeding rates and deprivation, maternal age and parity (Elton, 1993).

In 1993 a review of maternity services policies was issued by the Scottish Office Home and Health Department (SOHHD). This document titled the "Provision of Maternity Services in Scotland" did not set any breastfeeding targets (SOHHD, 1993a).

In the same year, the Scottish Office published "The Scottish Diet". This discussed breastfeeding, its importance in prevention of infant morbidity and suggested setting targets (SOHHD, 1993b).

In 1994 the Scottish Needs Assessment Programme (SNAP) document, "Breastfeeding in Scotland" outlined the epidemiology of breastfeeding, the health consequences of the current decline and recommended action (Campbell and Jones, 1994). Later that year, the Scottish Office set a target in Scotland of "50% of mothers to be breastfeeding their babies at six weeks of life by 2005" (MEL, 1994).

Also in 1994, "Weaning and the Weaning Diet" was produced as a Report of the Working Group on the Weaning Diet of COMA. This report stated that "breastmilk is the best source of nourishment for the early months of life" and recommended that mothers "breastfeed for at least four months and may choose to continue to breastfeed as the weaning diet becomes increasingly varied" (Department of Health, 1994).

The SJBI completed its four-year term in September 1995 but left behind a network of local groups to continue the process of promoting and protecting breastfeeding. The Scottish Breastfeeding Group was established to co-ordinate action. The remit of this group was to promote breastfeeding, to provide information and advice and to work with the Health Education Board to increase public awareness.

1:7:6. The Baby Friendly Hospital Initiative (BFHI) in Britain

In the early 1990s, the BFHI had begun to gather strength in Britain and in 1995 the first two Hospitals in England received the BFHI UK award. The UK award was developed because it was thought that it would be impossible for British hospitals to achieve the Global award which required at least 75% of mothers to be breastfeeding on discharge from

hospital. The UK award does not set a rate for breastfeeding at discharge but hospitals must adopt the "Ten Steps" (Appendix I).

In 1996, as the drive to become Baby Friendly continued, the first hospitals in Scotland received a "Certificate of Commitment". A hospital receiving a certificate of commitment must have adopted steps 1, 7 and 10 (Appendix I) and achieve Baby Friendly status within 24 months.

By August 1997, there were over 10,000 Baby Friendly Hospitals around the world. Four of those were in Britain; one hospital in England and one in Wales had received the Global Award, two other hospitals in England had received the UK award. A number of hospitals had received certificates of commitment, seven of which were in Scotland (Warren, 1997).

To continue the support and protection of breastfeeding, the Baby Friendly Initiative (BFI) began to implement a Community Initiative in 1997.

1:8. Summary of Chapter 1

Key Points

- The majority of babies in Europe were breastfed until the beginning of this century.
- Current practices that undermine breastfeeding originate from centuries of inappropriate religious, cultural and medical influence.
- Breastmilk is a live substance, which in addition to providing sufficient nutrients, enhances optimal development and offers protection from a number of diseases.
- A woman's choice of feeding is influenced by her socio-economic background, previous experience and the attitudes of her social and peer group. Health professionals have a lesser, but not unimportant, influence.
- The initiation and duration of breastfeeding are influenced by a mother's socio-economic background, the attitudes of friends and family and by hospital practices.
- Around 55% of mothers in Scotland initiate breastfeeding; however, less than half of these mothers breastfeed beyond six weeks.
- Breastfeeding prevalence varies widely within Scotland with a particularly low rate in Glasgow.

Chapter 2:

Health Promotion Approaches to Breastfeeding

Chapter 2: Health Promotion Approaches to Breastfeeding

Before exploring evaluations of attempts to promote breastfeeding it may be useful to consider the processes involved in health promotion.

The goal of health promotion is to reduce high-risk behaviour and encourage the adoption of healthier practices. Many health promotion activities are based on the Health Action model, which involves knowledge, attitude, behaviour and practice and tends to incorporate health education activities (Figure 1). The theory is that if certain information is provided this will change the population's knowledge, which will then change attitudes, behavioural intention and ultimately behaviour. This model also suggests that there must be post-decisional support (Tones & Tilford, 1994).

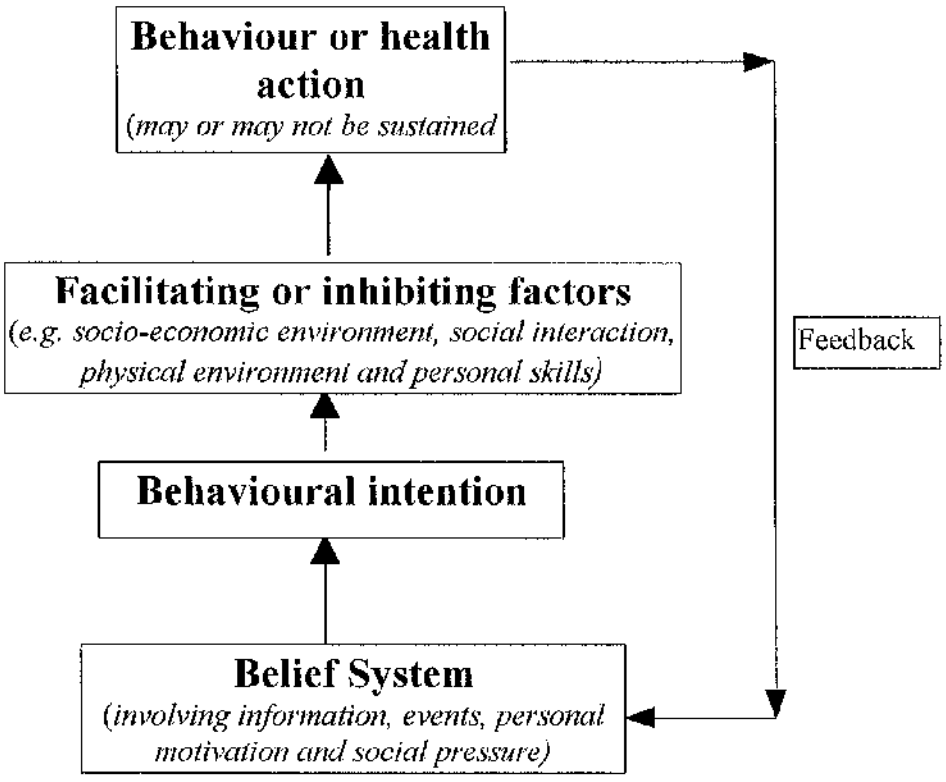


Figure 1. The Health Action Model, adapted from Tones and Tilford, 1994

The feedback process is important and serves to modify behaviour. In the case of breastfeeding, a mother may breastfeed because she knows it is healthier. However, her

experience of, for example, sore nipples may cause her to choose the less healthy behaviour and change to bottle-feeding. Once a behaviour has been chosen, it may become routine (an acceptable or enjoyable behaviour which will now recur automatically) or it may be reversed (if the experience was not acceptable or enjoyable). "Quasi-routine" behaviour is a particular behaviour that is so common that the individual is unaware that a choice might exist (Tones and Tilford, 1994).

Once knowledge about a particular behaviour has been given, certain barriers can prevent intention from becoming action; these may be physical, personal or social. It is therefore necessary to identify facilitating factors that will allow the healthy behaviour to be initiated and become established as a routine (Tones and Tilford, 1994).

It has been recognised that changing behaviour is very difficult. A model involving knowledge, attitude, beliefs etc. relies mainly on vertical communications from "top down". However, within a target group there are other influences acting horizontally such as the influences of social and peer groups. Acceptable behaviour within a peer group reflects shared beliefs that exert a pressure to conform, independent of individual knowledge. This will induce feelings of confidence when behaving in an appropriate or socially desirable manner (Svenson and Hanson, 1996). A health promotion programme that attempts to alter a behaviour that is "the norm" will thus find it difficult to be effective if it relies solely on the vertical model described above.

A review of the literature on interventions that attempted to reduce socio-economic health differences found that interventions often involved health education but that providing information was only successful if combined with personal support or structural measures such as changes in the physical environment (Gepkens and Gunning-Schepers, 1996).

2:1. Peer support and peer counselling

The importance of the peer group has been recognised by several authors, (Cushing and Kennedy, 1997; Halikas, 1993). This has led to a number of programmes using a 'peer' (someone who has shared common life experiences) to promote healthy behaviour. For example, the Health Cities Project in Glasgow uses Community Health Volunteers to promote healthy behaviour within their own community.

Svenson and Hanson (1996) recognised that peer influences had an important effect on condom use in an HIV-STD prevention programme and demonstrated a "communication gap" which seemed to suggest that the target group doubted the credibility of health authorities. The results of this study suggested that the participants did not feel that the campaign messages were relevant to them.

Very few studies have assessed the impact of providing peer support in an effort to reduce high-risk behaviour or increase healthy behaviour. In a pilot study in Manchester, women at risk of a low birthweight baby were offered the support of lay workers, but this did not significantly increase the mean birth weight or proportion of low birth weight infants. However, analysis of data was on an "intention to treat" basis rather than on the number who accepted lay support. The authors of the study also pointed out that it might not be possible to change outcomes such as birthweight by offering greater social support. Despite the results, the authors stated that "family workers increased the subjective well-being of their clients". Further analysis of the data also suggested that the lay workers might have had greater impact on some sub-groups compared to others (Spencer *et al.*, 1989).

An American study, a randomised trial of the Dollar-a-Day programme, compared the effect of monetary incentives and peer support on repeat adolescent pregnancies. The results showed that monetary incentives increased participation in the peer support group but that attendance at a peer support group did not decrease repeat pregnancy (Stevens-Simon *et al.*, 1997).

2:2. Promotion and support of breastfeeding

The promotion of breastfeeding has been described as the most effective strategy for improving health (Lutter, 1990).

It is often assumed that because breastfeeding is natural it is also instinctive. However, breastfeeding is a behaviour which was traditionally learned through conscious or subconscious observation during childhood and adolescence and then supported by practical advice from female relatives at the time of motherhood. In modern industrialised countries, where people tend to grow up in small, nuclear families, children can develop into adults and parents without ever seeing a baby breastfeed. These new families then tend to live

alone with little support from family and friends. Thus in western countries there is little opportunity both to observe this behaviour and to receive the practical advice and support necessary to sustain it. Breastfeeding promotion programmes have developed out of a need to replace the supportive, extended family and because we no longer learn about infant care during our own childhood. There have been a number of specific actions at both national and international levels that aim to promote and protect breastfeeding (Chapter 1).

Most breastfeeding promotion efforts aim to encourage women to initiate breastfeeding and to increase the duration of breastfeeding. Others attempt to alter professional attitudes and behaviour or hospital practices, while others try to encourage society as a whole to accept breastfeeding as the norm. In industrialised countries, because the health differences between breastfed and bottle-fed babies are less marked, it is more difficult to promote breastfeeding in terms of the immediate health benefits (Cunningham, 1988). However, the health benefits outlined in Chapter 1 demonstrate the continued need to promote and protect breastfeeding.

The ultimate target of all programmes is the mother or mother-to-be; however, women do not exist in isolation and as discussed in Chapter 1 there are many factors that influence the choice of feeding. Figure 2 shows the areas that appear to have the greatest influence:

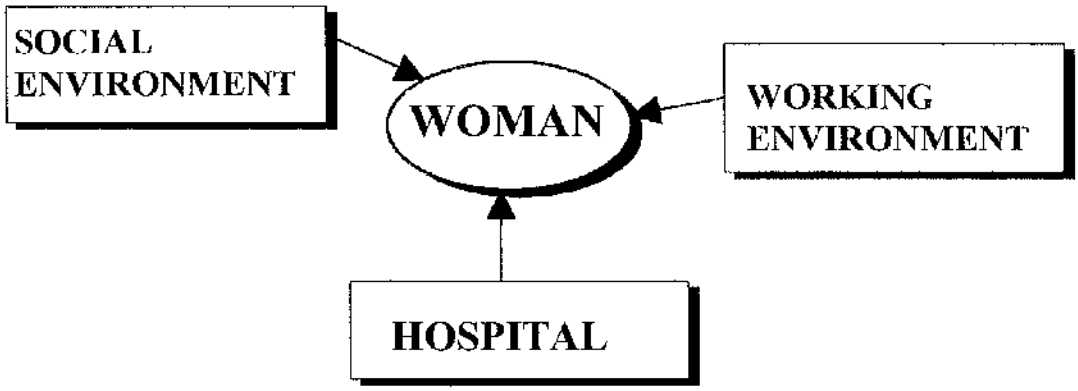


Figure 2: Areas of influence in choice and duration of infant feeding

Kelly *et al.* (1993) suggested that for health promotion programmes to be successful they should target four areas (environmental, social, organisational and individual) and that each activity be integrated with the others. The promotion of breastfeeding alone is not enough to encourage women to breastfeed but there also needs to be support of women who choose to breastfeed and protection of breastfeeding in institutions and society to enable

those who intend to breastfeed to actually do so (Auerbach, 1990b). The complex nature of the feeding decision implies that any promotion programmes will not be simple. Generally, however, most breastfeeding promotion programmes appear to tackle only one area for change and very few appear to have an integrated approach to all areas.

Due to the complex factors surrounding the decision to breastfeed, it is important for those planning breastfeeding promotion programmes to consider a mother's socio-economic and cultural background. It seems unlikely that one programme will affect all women equally when circumstances and attitudes vary. A breastfeeding education programme in Edinburgh which did appear to increase the prevalence of breastfeeding had little effect on women of low socio-economic status, suggesting that strategies might need to be tailored to meet the requirements of different groups of women (Kirk, 1979).

It may be that the timing of breastfeeding promotion is crucial to the success of the intervention. For instance as the feeding decision is often made before pregnancy, breastfeeding promotion in schools would be an obvious strategy. The time interval between school initiatives and any possible impact on breastfeeding rates is likely to be quite long making them difficult to evaluate. It may be appropriate to evaluate such studies, at least in the short term, by their impact on knowledge and attitudes. In Norwich, a schools education pack, "Breastfeeding Matters", was launched in 1994 in an attempt to increase awareness about breastfeeding (Agnew, 1996). However, there are no reports of proper evaluation studies of this or similar initiatives. Most promotional efforts concentrate on the perinatal period, i.e. the few days when the mother is in hospital around the time of delivery. Some investigate the effect of antenatal education, but according to White *et al.* (1992), most women have made up their minds by then. A review of the literature did not uncover reports of controlled trials assessing the impact of the time at which information or support was provided on the outcome of breastfeeding.

One study which examined the effect of giving information on postpartum care to women at different times in pregnancy and postpartum, compared the difference between receiving no information with receiving antenatal information or postnatal information or antenatal information which was then repeated postnatally. The results show no difference between the four groups when completing a test at 5-13 postnatal days. The study was very small,

with only 10 in each group and breastfeeding was not included in the material taught (Petrowski, 1981).

The remainder of this chapter will explore documented reports of studies that attempted to increase breastfeeding. The electronic databases, Medline, BIDS and CINAHL, were examined from 1970 to 1998 using the terms breastfeeding, promotion and English language. The Health Education Board for Scotland (HEBS) Library was contacted and they provided a search of their databases from 1988 to 1998 using the search terms breastfeeding, health promotion, evaluation studies. Articles were also obtained from the reference lists of journal articles. In order to reduce cultural differences, articles relating to studies in non-industrialised countries were largely ignored. The studies were then divided into categories depending on the target of the promotional message. Three main groups were identified: programmes aimed at mothers/pregnant women (2:2:2); those aimed at hospitals (2:2:3) and those aimed at society (2:2:4). Programmes aimed at the woman/mother were considered in greater detail and were further divided depending on the components of each intervention. Such studies could be grouped according to whether they provided antenatal education, postnatal education, postnatal support, postnatal education and support or a combination of antenatal education and postnatal support. A brief summary of promotional efforts aimed at hospitals and society is also given. Finally, the electronic databases and the HEBS databases were again explored using the terms breastfeeding and peer support or breastfeeding and peer counselling. Additional studies were also obtained from the reference lists of journal articles. The studies found using these terms are documented in section 2:3.

2:2:1. Evaluation of programmes to promote breastfeeding

It is widely accepted that an increase in the breastfeeding rate will improve the nutritional status and health of children. The effectiveness of most programmes is therefore measured by assessing whether the initiation or duration of breastfeeding actually increased in the target group, although few studies define what actually constitutes breastfeeding. Those that do, provide definitions that vary from exclusive breastfeeding to at least one breastfeed per day. In some studies, effectiveness is measured by change in knowledge and/or attitude among the target group with the ultimate aim of increasing the rates of breastfeeding.

Very few programmes measure effectiveness in terms of the mother's perception of her breastfeeding experience. It may be important to collect qualitative data instead of, or in addition to, purely quantitative measures (e.g. proportion breastfeeding, length of breastfeeding). A mother who feels she has breastfed successfully may be more confident about her ability to breastfeed, may be more likely to breastfeed a subsequent baby and is likely to speak more favourably about breastfeeding than a mother who has had an unsatisfactory breastfeeding experience.

In one study more of those who received antenatal breastfeeding education (intervention) reported feeling successful in breastfeeding compared to those who had not received education (control). The study also demonstrated a difference in the mothers' perception of her baby (using the Neonatal Perception Inventory) when comparing the intervention and control groups. Participants were primiparous women, who had already registered to attend childbirth education classes and who intended to breastfeed. The majority had also completed a college education (Wiles, 1984). However, a small study which increased knowledge, but not initiation, of breastfeeding in a group of low income women showed no difference between the intervention and control groups in the mothers' perception of successful breastfeeding (Hill, 1987).

As discussed earlier, there appear to be different needs for women from different backgrounds but there is often little analysis of the outcome for different age groups or educational backgrounds. A study in Edinburgh indicated that breastfeeding education by the Department of Health and Social Security (DHSS) was relatively ineffective for mothers of low socio-economic status but was more effective for those of higher status (Kirk, 1976). It may be useful to measure effectiveness across different socio-economic groups to enable programmes to be tailored to meet the needs of specific groups. It may also be useful to examine results relating to age, parity, previous experience or home support.

Fredrickson (1993) stated that "policy change and financial incentives are instrumental for protecting and promoting healthful behaviour". This suggests that programmes should be evaluated, at least in part, in terms of their financial savings to the health service or to the individual.

2:2:2. Programmes that target mothers

The majority of programmes attempt to bring about a change in one or more of the following areas: knowledge, attitudes and / or practices. Such programmes usually provide antenatal or postnatal education or postnatal support or a combination of education and support.

2:2:2:1. Antenatal education

Antenatal education can be delivered in the form of a leaflet or booklet or by discussion either as a group or one-to-one. Providing information about breastfeeding may increase knowledge but appears to have little affect on attitudes to feeding or on feeding behaviour (Mazen and Leventhal, 1972; Kaplowitz and Olsen, 1983).

Kaplowitz and Olsen (1983) randomised 44 pregnant women to either a treatment or a control group. The treatment group was then mailed a series of pamphlets, which gave information and practical advice about breastfeeding. At the end of the trial, there was a significant increase in knowledge in the intervention groups but no difference in attitude or breastfeeding behaviour. An increase in positive attitude to breastfeeding was recorded among women who intended to breastfeed or who were undecided. Participants were women who had never previously breastfed or succeeded in breastfeeding (i.e. primigravida or multigravida who had previously bottle-fed or had an unsuccessful breastfeeding experience). The greatest influence was noted among women who were unsure about feeding. The authors suggested that this might be due to a lack of established beliefs against breastfeeding. The authors also acknowledged that it is difficult to change attitudes and that leaflets were likely to be less successful than interpersonal communication.

A quasi-experimental trial, which assessed the impact of an "explanatory and encouraging" leaflet given to antenatal women in the last trimester of pregnancy, found no affect on breastfeeding rate or duration (Gilmore *et al.*, 1979).

In another study no difference was found in the duration of breastfeeding among 15 women who received an antenatal information leaflet compared to 15 who did not. However, the leaflet may have been useful in reducing some breastfeeding difficulties (Swanwick, 1992).

An evaluation of literature to promote breastfeeding demonstrated that while 80% of non-profit literature had a positive approach to breastfeeding only 8% of commercial literature appeared positive. Non-profit literature provided more accurate information and was more compliant with the WHO Code (WHO/UNICEF, 1981b). Reading level for both sources of literature was high. Commercial pamphlets were also more likely to be glossy and freely available in large quantities (Valaitis and Shea, 1993).

Giving information in a more interactive manner may result in a more positive outcome. Information communicated verbally may be more influential than literature. To assess the influence of "communicator-recipient similarity" in communicating the importance of breastfeeding and "rooming-in", pregnant women were exposed to either no information, factual information only, or factual information combined with a personal endorsement from someone of the same/different colour and/or pregnant or not pregnant. Information was conveyed verbally in small groups. This was evaluated in terms of attitudes and behaviour. The results showed that providing information had no significant effect on attitudes and behaviour. However the communicator appeared to be important, i.e. "visible similarity consistently increased behavioural compliance with the communicators recommendations" (Mazen and Leventhal, 1972).

An antenatal breastfeeding education programme which included a slide programme with a lecture and discussion, a question and answer period and an information booklet was administered to a small group of low-income pregnant women (N=31). The intervention group were reported to have greater knowledge of breastfeeding than a control group but were no more likely to initiate breastfeeding or to breastfeed for any longer. This study, which was fairly small (N=64), included all mothers, regardless of feeding intention and parity (Hill, 1987).

The studies documented above suggest that for some mothers the provision of factual breastfeeding information alone may not be sufficient encouragement to initiate breastfeeding. However, information provided to women intending to breastfeed may increase the likelihood of successful breastfeeding. Matich and Simms (1992) showed that women who were intending to breastfeed sought more information and therefore perceived that they had received more information and support than those intending to bottle-feed.

However, the authors could not show any difference in emotional support between women who were breastfeeding and those who were bottle-feeding.

Other studies have documented increases in breastfeeding as a result of providing information at either individual counselling or group sessions. An American study (Kistin *et al.*, 1990) randomised women to attend one of two intervention groups or a control group. The interventions comprised attendance at either individual or group educational sessions. A paediatrician or nurse practitioner led both sessions and although mothers could attend only one type of session they could attend more than one. The authors found that mothers in the intervention groups were more likely to carry out their prenatal intention to breastfeed compared to control mothers. They also found that intervention mothers were more likely to breastfeed despite their antenatal intention to bottle-feed. The authors suggested that the group sessions had been valuable in encouraging women who intended to breastfeed to actually do so, while the individual sessions were more important in changing mother's minds. The effect on breastfeeding duration was less clear. However, mothers attending the group sessions had significantly higher breastfeeding at 12 weeks when compared to the individual sessions or the control group, but numbers were very small at this stage (6, 2, 2 respectively). The authors suggested that this might be due to the peer support that exists in group sessions. This study which targeted black, low income women living in an urban area of America, was quite small (N=159) and had a fairly high drop out rate. Breastfeeding was defined as one or more feed/s per day. A follow-up study (Kistin *et al.*, 1994) which examined the affect of peer support is discussed in section 2:3.

A study in Chile (Pugin *et al.*, 1996) indicated that mothers attending prenatal breastfeeding skills group education were more likely to remain fully breastfeeding at six months compared to mothers who had not attended. This study built upon a number of other activities that aimed to increase breastfeeding. The group education comprised three to five 20-minute sessions. Five to six women, in the last trimester of pregnancy, attended each session. Participants (N=59) were compared to historical controls (N=363). Data analysis excluded the effect of time on the increase in breastfeeding in the intervention group This positive outcome was significant for primiparous, but not for multiparous, women.

An Israeli survey (Shoham-Yakubovich, 1990) of the impact of a health education course in villages in the West Bank territories found that mothers attending the health education

course appeared more likely to breastfeed. Village participation in the programme was voluntary and in participating villages most mothers of young children attended. However, it is difficult to assess whether breastfeeding mothers were more likely to attend or whether those who attended were more likely to breastfeed. It is also unclear whether women attended this course before they gave birth or after. A comparison of the experimental group (attended course) with the control (no course) found that more of the experimental group had delivered at home (51% versus 35%). Women who delivered at home were also more likely to breastfeed than women who delivered in hospital (97% versus 74%). Information was collected from six mothers from each village by structured interview and the authors acknowledged that experimental mother may report differences in behaviour but may, in fact, not behave differently.

In researching attitudes of low-income women and adolescents, Bryant *et al.* (1992) observed that individuals who stated an intention to bottle-feed became less decisive in a group situation and showed interest in breastfeeding. Some women also changed their feeding intention after hearing someone speak positively about the advantages of breastfeeding. The social support provided by a group may give a mother the confidence to behave in a manner different to her peer group.

It has been suggested that breastfeeding promotion initiatives should be culturally appropriate. Thus assessment of the target group will highlight particular sociocultural barriers that might inhibit breastfeeding (Abramson, 1992). A randomised controlled trial based in Australia (Rossiter, 1994) compared Vietnamese women who had attended a culture and language-specific education programme (experimental group) with those who had attended a non culture-specific education programme (control group). The programme comprised videos and three two-hour small group discussions. The experimental group demonstrated an increase in knowledge about breastfeeding, increased positive attitude to breastfeeding, increased intention to breastfeed and increased breastfeeding frequency at birth and four weeks compared to the control group. The effect was not sustained to six months, which the authors suggested might be due to lack of continuous support. This study included primiparous and multiparous women, the majority of whom were educated to secondary school standard and were unemployed. The study and control groups were fairly similar except that the control group had more previous experience of breastfeeding.

Since the same people who provided breastfeeding support collected the data, the results may be biased. Breastfeeding was defined as where breastmilk was the main source of nutrition.

2:2:2:2. Postnatal information

Postnatal information may be written (leaflet or booklet) or spoken (one-to-one counselling, group discussion or group teaching). A number of studies have examined the impact of these methods of providing information.

A breastfeeding information booklet was sent to a random sample of 75 mothers on discharge from hospital (intervention group). When compared to a control group, which had not received a booklet, there was no statistically significant difference in the duration of breastfeeding. However breastfeeding survival at eight and twelve weeks was increased in the intervention group and the booklet was cited as useful by 97% of intervention group mothers. The authors found that the actual duration of breastfeeding was significantly related to the intended duration of breastfeeding. They also noted that the control group intended to breastfeed longer, which may have confounded the results. Breastfeeding was defined as at least one feed per day (Hauck and Dimmock, 1994).

A large Italian trial (Curro *et al.*, 1997) randomised 200 mothers to receive verbal counselling only or to receive both verbal counselling and a booklet. No statistically significant difference was found between either group with respect to the prevalence of exclusive or complementary breastfeeding at six months of age. Participants were primiparous mothers of healthy term new-borns who were currently exclusively breastfeeding. The mothers were contacted when their baby was 10-20 days old. The authors suggested that a booklet might be of use if combined with more individual support. The booklet may have been administered too late to prevent practices that ultimately lead to early weaning.

Providing information in a more interactive manner may be more successful. A study in Turkey (Neyzi *et al.*, 1991a) randomised 941 primiparous mothers into a control and an intervention group. The intervention comprised attendance at a group educational session while in hospital, followed by one-to-one education at home at five to seven postnatal days and the provision of a booklet. Intervention group mothers reported a higher frequency of

exclusive breastfeeding in the first two months. After the first two months, however, there was no difference between the experimental and control groups.

2:2:2:3. Postnatal support with or without information

Breastfeeding has been shown to increase with support from an enthusiastic individual (Creery, 1973; Coles *et al.*, 1978; Salariya *et al.*, 1980). Moreover, women have been put off breastfeeding or stopped feeding early because of inappropriate support (Mobbs, 1972; Bacon and Wylie, 1975; Wright, 1993).

Around 50% of women in Scotland attempt to breastfeed but around 20% of them have given up within the first two weeks, suggesting a need for some sort of support system once a mother is at home. In a small non-randomised study (Houston *et al.*, 1981) which examined home support in Scotland, 100% of the study group of 28 mothers were still breastfeeding at 12 weeks compared to only 50% of the control group of 52 mothers. The study group received fortnightly visits by the same person (a midwife) while the control group received routine health care. Important factors were thought to include being visited by the same person who gave consistent advice and the formation of a trusting relationship. Visits were by appointment thus "mothers knew when to expect a visit and could tolerate problems better because they knew that help was at hand". The beneficial effect of this programme on breastfeeding was statistically significant only for social class III and IV. This study did not include mothers from social class V. The authors also found a difference between control and study groups in the introduction of solids. At 16 weeks, 83% of the control had introduced solids compared to only 28% of the study group. Further analysis demonstrated that this difference was only significant for social class I and II. Breastfeeding was not defined in this study.

A second study by Neyzi *et al.* (1991b) had a greater impact on the duration of exclusive breastfeeding up to four months. This study combined postnatal information (two educational sessions, one group and one at home) with follow-up support (attended well baby clinic for four months and telephone support if required). More mothers who received extra support (68%) were exclusively breastfeeding at four months compared to the mothers who had not received extra support (5%). Family members, in particular mothers and mothers-in-law were encouraged to attend the postnatal sessions.

Telephone support in the postnatal period can increase the duration of breastfeeding. In a randomised-controlled trial (Bloom *et al.*, 1982b), 157 married primiparous mothers received an information leaflet on breastfeeding techniques and infant behaviour. In addition, half the sample (study mothers) also received weekly telephone calls for three weeks beginning at ten days postpartum. Mothers with problems were referred to the maternity hospital. Data collected by "blind" telephone interview indicated that the average duration of breastfeeding was extended by one week (from 21 to 28 days) in the group receiving telephone support. Breastfeeding was not defined in this study.

An American study (Schy *et al.*, 1996) hypothesised that attendance at a breastfeeding information session would increase both the duration of breastfeeding and mothers' satisfaction with breastfeeding. Mothers were randomly assigned to either the experimental or the control group. The experimental group attended a 30-60 minute information session followed by daily contact with a lactation specialist while in hospital. Once home, both groups had access to a telephone helpline and were contacted every month to assess feeding status. No differences in the duration of breastfeeding were found between the experimental and the control group. There was also no difference in breastfeeding satisfaction scores between the two groups. Although there was contamination of the experimental and control subjects while in hospital, analysis showed that this was probably not responsible for the negative result. It may be that monthly telephone calls and a helpline assisted the controls to breastfeed. The participants in this project tended to be middle to upper class and all intended to breastfeed. This study showed that duration of breastfeeding was related to the mothers perceived level of satisfaction, her educational level and how long she expected to breastfeed. Other studies have supported this last conclusion (see White *et al.*, 1992).

Postnatal support comprising a visit by a lactation specialist where feeding was observed, technique discussed and follow-up support offered while in hospital; a supportive phone call or letter at approximately four days and a support class at two weeks was provided to a group of low income mothers. All participants had enrolled with the WIC (Women, Infants and Children) programme. When compared to historical controls, breastfeeding duration in the supported group was increased but this was not statistically significant. The greatest impact on breastfeeding was found amongst mothers who had received all of the support measures listed above. However, as historical controls were used, the positive result may

reflect changes in infant feeding behaviour related to the time difference. No definition of breastfeeding was given (Saunders and Carroll, 1988).

A hospital-based education programme (30-45 minutes one-to-one with project nurse, plus a breastfeeding booklet) followed by home telephone support, did not affect the duration of breastfeeding for low-income breastfeeding women. Ninety-seven women were randomised to participate in the programme (experimental) or to receive routine care (control). Contamination and the Hawthorne effect (whereby subjects alter their behaviour because they are aware of their participation in a study) may have been responsible for the results. The authors also suggested that project staff stimulated other staff to be more supportive of breastfeeding (Grossman, 1990).

In a similar study, 270 mothers (primiparous and multiparous) were randomised to either an experimental or control group. Mothers in the experimental group then received an educational and supportive home visit by a breastfeeding consultant within five days of birth followed by weekly then monthly phone calls up to six months. Experimental group mothers were also offered additional telephone support or home visits if they required help or information. The results showed no significant difference between experimental and control groups in the duration of breastfeeding or in their knowledge of lactation. However, the programme was shown to be effective in the subgroup of mothers who had made their decision to breastfeed later in pregnancy. In this study, few of the mothers (<30%) voluntarily contacted the breastfeeding consultant although 45% of the experimental group reported that the consultant had been helpful (Lynch *et al.*, 1986).

Jones and West (1985) demonstrated significantly increased duration of breastfeeding in a study group of mothers who were supported by a lactation nurse. This large randomised-controlled trial was based in a district general hospital in Wales. All mothers who attempted breastfeeding were included in the trial and randomisation was by means of timing of delivery and discharge to avoid contamination of cases and controls. Trained midwives helped mothers in the intervention group to establish and maintain breastfeeding in hospital and at home. There was a significant increase in the duration of breastfeeding among intervention women up to four months postpartum. Further analysis of the data demonstrated that the intervention had been most successful among mothers of the lower social groups and among mothers who had previously not succeeded in breastfeeding. Data

were collected at birth and then at 12 months which may introduce recall bias. Breastfeeding was not defined.

Community based support groups have been established around the world. Although there is no specific information on their impact, their growth suggests that they play an important part at least for those who participate. An increase in breastfeeding in Austria was partly attributed to mothers support groups (Haschke *et al.*, 1988) although no formal research study was carried out to assess this.

2:2:2:4. Antenatal education combined with postnatal support

While provision of antenatal education followed by on-going postnatal support might be an effective way of increasing breastfeeding very few studies appear to have assessed this.

In a small English study (Jenner, 1988), 38 working-class primigravida who intended to breastfeed were randomised to a control or an experimental group. Women in the experimental group received two antenatal home visits to discuss breastfeeding and also received three pieces of literature. After delivery, experimental mothers received one or two "encouraging and supportive" home visits, telephone support was also available. At three months 68% of experimental mothers compared to 21% of control mothers reported exclusive breastfeeding. The author acknowledged that as the intervention was delivered by the same person who evaluated its effectiveness, this may have confounded the results.

A community-based project in Mexico (Rodriguez-Garcia, 1990) targeted second time mothers in late pregnancy to participate in a programme of breastfeeding education. Four villages were selected, a combination of interventions were applied to three while the fourth village acted as a control. Education was provided in a group or individually or as a combination of group and individual teaching. This was followed up with two visits a month for the first six months. The programme was backed up by a comprehensive strategy to promote breastfeeding within the community. Preliminary results demonstrated increased breastfeeding in the intervention. This project also reported more success where breastfeeding was promoted by "promotoras" who were local mothers who had breastfed their own children and had demonstrated leadership capacities in other volunteer efforts in the community. An unexpected outcome was the formation of informal woman's support

groups. A paper reporting statistical analysis and the final findings of this study does not appear to have been published.

2:2:3. Programmes that target hospitals

Several programmes have sought to change the hospital environment either by educating the health professionals or by changing hospital practices which have been shown to be detrimental to breastfeeding (Chapter 1:6). Recent research has shown that many hospital practices have a negative affect on breastfeeding (Bergevin *et al.*, 1983; Feinstein *et al.*, 1986; Frank *et al.*, 1987; Waterson and Davies, 1993; Blomquist *et al.*, 1994) and that hospitals which conform to the "Ten Steps to Successful Breastfeeding" (Appendix I) improve their breastfeeding rates. In some instances, despite positive attitudes on the part of hospital staff, good practice guidelines were not always followed. For breastfeeding support to be effective hospital practices should be monitored and lactation management training should be provided for staff (Beeken and Waterson, 1992).

2:2:4. Programmes that target society

Projects targeted at society aim to influence the knowledge and attitudes of partners, friends and relatives or may aim at the wider spectrum of society, seeking to reduce the influence of advertising, improve maternity leave, improve working conditions for breastfeeding mothers or implement policies to protect breastfeeding. These programmes often use the media to facilitate change.

In 1978, the Canadian Medical Association published a paper endorsing breastfeeding. This led to a National Awareness programme that included public education and health professional development. The increase in breastfeeding in Canada which began in the 1980s was attributed to the interaction of many variables including the formation of support groups, social acceptance of breastfeeding, de-medicalisation of childbirth, promotion of breastfeeding as the norm and governmental support (Myres, 1988).

In 1975, Greater Glasgow Health Board acknowledged that the promotion of breastfeeding would require changing social attitudes rather than advocating breastfeeding to antenatal mothers (Busby *et al.*, 1976).

A five-week campaign in Canada, which comprised twice daily advertising on television and weekly advertisements in local newspapers, attempted to change adolescents' attitudes to breastfeeding. The results demonstrated that only the television advertising positively influenced knowledge and attitudes. The successful outcome of television compared to newspaper advertising was explained by the greater popularity of television compared to newspapers and because the adverts appeared more often on television. (Friel, 1989).

As increasing numbers of women intend to return to work after giving birth, the working environment could have an effect on the duration of breastfeeding. More women may be encouraged to continue to breastfeed if there was legislation to protect them and to improve working conditions, maternity pay and leave. Norway, which has one of the highest rates of breastfeeding in the western world, also has one of the best provisions for maternity leave (Hakansson, 1997). In the USA, some companies have instituted policies that support breastfeeding. This has been done without legislation because it increased productivity through reduced absenteeism (Maternity Action, 1997).

2:3. Promotion of breastfeeding by peer support

It has long been recognised that breastfeeding initiation and duration can be influenced by the support of an enthusiastic and encouraging individual (Creery, 1973; Coles *et al.*, 1978; Salariya *et al.*, 1980). A positive role model is regarded as one of the most important influences in a woman's decision to breastfeed (Foster *et al.*, 1997). Kistin *et al.*, (1990) hypothesised that peer support increased the duration of breastfeeding but did not evaluate it in that study. A Mexican study demonstrated more success where breastfeeding was promoted by local mothers who had breastfed their own children, (Rodriguez-Garcia, 1990). Very few trials appear to have used peer support to promote breastfeeding and those that do lack good study design and/or evaluation.

A study by Kistin *et al.* (1994) followed up an initial hypothesis that peer support increased the duration of breastfeeding. Breastfeeding initiation, duration and exclusivity were increased in a group receiving peer support (study group) compared to an unsupported group (control group). Participants were low-income women who intended to breastfeed or who were breastfeeding and had requested a peer counsellor. Support was provided by telephone and home visits were "not commonly made". Data were collected by interview at

time of recruitment and thereafter by telephone by the peer counsellors or the project supervisor; no attempt was made to validate the data recorded by telephone. The control group consisted of mothers who had requested a peer counsellor but had not been provided with one. There were no statistically significant differences when comparing the socio-economic variables in the study and control groups, however the study group had more previous experience of breastfeeding (22% and 14% in the study and control groups respectively). This was a small study, 59 in the study group and 43 in the control group, of which 82% and 80% respectively were followed up to 12 weeks. In is not clear what proportion of each group was recruited antenatally (intending to breastfeed) or postnatally (breastfeeding), nor was there any measure of feeding intention. The authors acknowledged inconsistencies in the level of support provided but suggested that peer counsellors assisted mothers to carry out their antenatal intention to breastfeed.

The Nottingham peer counsellor programme was set up in 1991 in response to a need for more help for breastfeeding mothers from low-income groups. Peer counsellors attend antenatal classes where support is offered. They are also available for telephone contact and offer one-to-one support. Breastfeeding figures collected over a month showed a small increase in the initiation and a larger increase in the duration of breastfeeding in the area where the Peer Counsellors worked when compared with a "broadly similar area" (Wright, 1996). There was no information on sample size for the above figures. A formal assessment of the impact of this initiative does not appear to have been published.

The Utah Peer Counsellor Programme aimed to increase the initiation and duration of breastfeeding among native Americans. Two trained peer counsellors contacted women in the last month of pregnancy at home and/or at the antenatal clinic. Participants were also able to contact their peer counsellor if they needed information. Postnatal visits were carried out at one, two, four and six weeks. The peer counsellor also collected data at postpartum visits, which may introduce reporting bias. Breastfeeding was defined as at least one breastfeed per day and breastfeeding rates were compared to historical controls. Because the breastfeeding rate was high (70%) statistical significance was set at $p \leq 0.08$. Initiation of breastfeeding was higher in the peer counsellor group ($p=0.07$), however there was no information on antenatal intention for the control group. Breastfeeding at three months was also higher in the supported group when compared to the unsupported historical controls

($p=0.08$). Breastfeeding rates at six months were similar in the supported group and the control group. The authors suggested that the peer counsellor was a substitute for the *doula,* or birth attendant, found in traditional Native American cultures (Long *et al.*, 1995).

An important form of peer support is the mother-to-mother support group. These have become more numerous in recent years. The impact of these groups on breastfeeding has never been properly evaluated. However, it was suggested that the increase in support groups had contributed to the great increase in the prevalence of breastfeeding in Scandinavia during the 1970s and 1980s, (Helsing, 1990).

2:4. Summary of Chapter 2

Key Points

- Health Promotion programmes are more likely to be successful if they provide information combined with personal support and/or structural measures
- The peer group exerts a powerful influence on the individual
- The majority of breastfeeding initiatives target the pregnant women or the new mother
- Most initiatives focus on the perinatal period
- Very few projects which aim to increase breastfeeding define what constitutes breastfeeding
- The majority of breastfeeding programmes are evaluated in terms of their impact on breastfeeding initiation and / or duration
- Antenatal education may change knowledge but appears to have little effect on behaviour
- Group postnatal education may have greater effect on breastfeeding duration than individual counselling
- Postnatal support appears to increase the duration of breastfeeding
- Peer support for breastfeeding has been initiated but studies have been poorly designed and/or evaluated

Chapter 3:

The Study Setting

Chapter 3: The Study Setting

3:1. The City of Glasgow

Glasgow is a large industrialised city located on the west coast of Scotland. It developed rapidly in the first industrial revolution from a trading centre to an important industrial centre for engineering and shipbuilding. As the industries expanded, an influx of workers brought about a population increase, which led to chronic overcrowding.

The congested and unsanitary living conditions caused frequent outbreaks of infectious diseases. Attempts to reduce these problems included demolishing the overcrowded slums in the heart of the city and providing subsidised housing. In spite of this, conditions remained poor and in the 1950s many Glaswegians (residents of Glasgow) were relocated to nearby towns including the two new towns of East Kilbride and Cumbernauld. At the same time, the large housing estates of *Drumchapel*, *Easterhouse*, *Castlemilk* and *Pollok* were built around the perimeter of the city. These large, working class suburbs each with populations of 25-30 000, provided better housing but few social and community facilities and very limited local employment opportunities.

Vandalism, trespass and delinquency combined with a falling population in the 1970s made living in these estates unpopular. Later, as the estates were improved, changes addressed the emotional, environmental and community needs of individuals. Current initiatives attempting to improve living conditions are more aware of individual and community needs and involve local people in planning and implementing changes such as upgrading housing, providing amenities, and running programmes which address social and health-care issues.

3:2. Health in Glasgow

During the first half of the 19th century, infectious diseases such as typhoid, cholera and measles were the most common causes of death in Glasgow. Later as a result of developments in public health, diseases such as bronchitis and tuberculosis became more important. Now, following improvements in housing and the environment, heart disease and cancers are the major causes of death in Glasgow. The death rate in Glasgow is about 11%

above the Scottish average and death from heart disease is the highest in the world (SOHHD, 1993b). Many of these deaths could be prevented. Most diseases of the past and the present have disproportionately affected the poor (Healthy City's Project, 1989). This relationship between socio-economic deprivation and ill health is now widely accepted.

3:3. Breastfeeding in Glasgow

Glasgow has more areas of extreme deprivation than any other city in Scotland and also has the lowest breastfeeding rate. Breastfeeding in Glasgow ranges from 61% in the affluent suburbs of Bearsden and Milngavie to as low as 10% in the peripheral housing estates of Easterhouse and Castlemilk, (Source: Guthrie Data, see also Ferguson *et al.*, 1994). This agrees with research that relates infant feeding with maternal background and socio-economic status, (Chapter 1.5). Table 5 demonstrates the association between breastfeeding and area type:

Table 5 - Breastfeeding and neighbourhood type

		Breastfeeding rate:		
	Neighbourhood Type	**1993**	**1994**	**1995**
G61 (Bearsden)	Type 1 (most affluent)	61%	61%	71%
G11 (Broomhill)	Type 3	56%	55%	62%
G53 (Pollok)	Type 5	21%	17%	18%
G34 (Easterhouse)	Type 7 (least affluent)	8%	10%	8%

Data source: Guthrie Card Data, for details of neighbourhood type, see Appendix II.

In 1992, after a review of the breastfeeding statistics, Greater Glasgow Health Board (GGHB) took action to improve breastfeeding practices. This comprised:

1. Training for hospital based health professionals (The Bloomsbury Workshops).
2. Producing a breastfeeding policy.
3. Supporting the work of the Scottish Joint Breastfeeding Initiative (SJBI).
4. Supporting several breastfeeding initiatives through the Healthy Cities Project.
5. Looking at introducing the Baby Friendly Hospital Initiative into Glasgow hospitals.
6. Funding the Glasgow Infant Feeding Action Research Project.

Chapter 4:

Aim, Objectives and Rationale of the Study

Chapter 4: Aim, Objectives and Rationale of the Study

4:1. Aim

The aim of this study was to develop, implement and evaluate a community based intervention designed to increase the initiation and duration of breastfeeding in a socially disadvantaged urban area of Glasgow.

4:2. Objectives

1. To assess the feasibility of recruiting and training lay breastfeeding counsellors who have previously breastfed and who live within the target area.

2. To develop an acceptable and efficient means of ensuring a specified number of personal contacts between the local counsellors and all mothers, both antenatally and postnatally, within the target area over a defined period of time without duplicating or adversely affecting the delivery of routine services.

3. To evaluate the intervention in the target area by assessing:
    a. its acceptability to mothers and health professionals.
    b. its impact on breastfeeding intentions and frequency (up to six weeks postnatally).

4. To make recommendations for future efforts to promote breastfeeding in disadvantaged areas.

4:3. Rationale of the study

The study was designed to test the hypothesis that providing greater information and support to antenatal and postnatal women will increase the initiation and duration of breastfeeding. As breastfeeding is a behaviour predominately associated in the developed world with well-educated women from advantaged backgrounds, it is possible that women from more deprived areas lack the support networks that are already functioning in other areas. From previous research, it appeared that an intervention providing postnatal support

for breastfeeding women would be most likely to be successful. In the socially deprived areas of Glasgow considered for this project, however, breastfeeding was so uncommon that very few women appeared to have considered the options. Thus, it seemed essential to give information on breastfeeding in the antenatal period to encourage more women to attempt to breastfeed. It was postulated that an intervention providing both antenatal information and postnatal support would be more likely to be effective in this context.

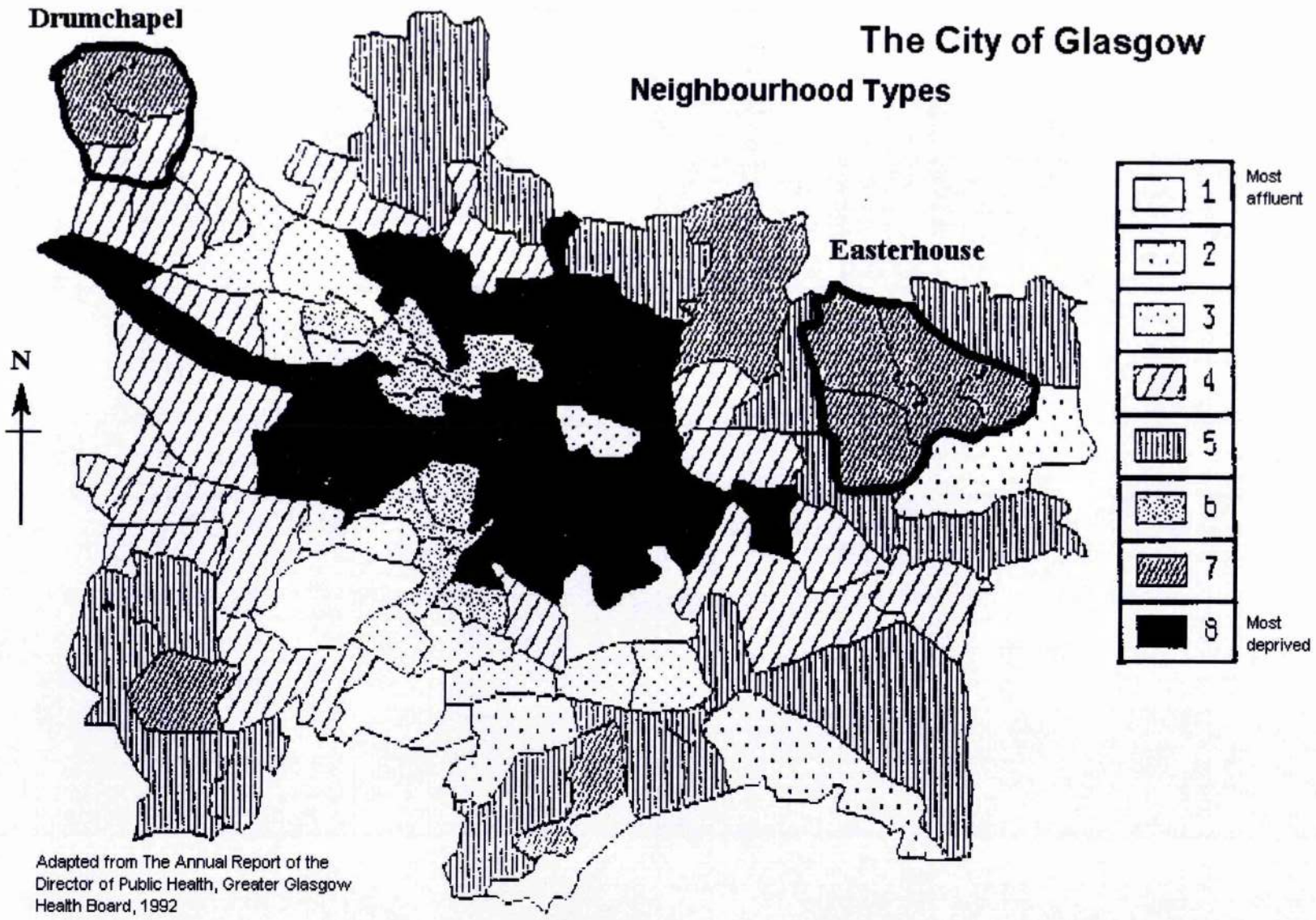
Breastfeeding information was already provided at antenatal classes, and women who attend antenatal classes are more likely to breastfeed (White *et al.*, 1992, Foster *et al.*, 1997). However, women from more deprived areas generally do not attend such classes. For this reason the intervention was conceived as a means of disseminating information in a locally acceptable manner. It was assumed that information provided by local women with breastfeeding skills would have a more positive effect than that delivered by health professionals from very different social backgrounds.

It was also postulated that this community-based intervention might have a community effect, whereby the effects of local counsellors would spread beyond their immediate contact with the intervention sample. People do not live in isolation and by visiting study women, it was believed that the local counsellors might raise community awareness about the project and about breastfeeding itself.

While this intervention was unlikely to change the opinion of those who were determined to bottle-feed, it aimed to encourage women to at least consider breastfeeding as an option. Many women could not give a real reason why they chose to bottle-feed but appeared to merely emulate the most visible behaviour in their community. The intervention aimed to encourage all women to think about breastfeeding and to make an informed choice about infant feeding, and to help those who choose to breastfeed to carry out their intention.

Chapter 5:

Materials and Methods



Adapted from The Annual Report of the Director of Public Health, Greater Glasgow Health Board, 1992

Chapter 5: Materials and Methods

5:1. Research design

The study employed a quasi-experimental design using two naturally occurring, geographically separate communities which met the following criteria:

- very low incidence of breastfeeding
- demographically and socially similar
- served by separate maternity hospitals
- accessible to the researcher

The intervention was introduced to one community while the other served as the control.

5:1:1. Study areas

Two areas conforming to the above criteria were Easterhouse and Drumchapel, large peripheral housing estates, located to the north east and the north west of Glasgow respectively (see map opposite). The areas shared similar demographic and social characteristics, (Appendix III, Tables 1A and 2). There was obviously no guarantee, however, that the two communities were identical with respect to all relevant factors or that they would remain unchanged during the project.

5:1:2. Sample size

Sample size was determined using the Epi-info programme for unmatched cohort studies. As there were few data available on breastfeeding rates in either the intervention or the control area, it was assumed for this purpose that at six weeks 12% of mothers exposed to the intervention would be breastfeeding compared to 6% of the control mothers. To achieve this at least 389 women were required in each area, assuming a power of 80% and a 95% confidence interval. At the planning stage the annual number of births in Easterhouse (intervention) was 315 and in Drumchapel (control) was 381. It was calculated that, allowing for attrition of the sample, an intervention spanning two years should ensure an adequate sample size (i.e. approximately 600 intervention subjects and 750 controls).

The possibility was considered of restricting the sample to primigravida as they were less likely to have established feeding patterns, but this would have resulted in too small a sample size to achieve the necessary statistical power in the time available.

5:2. Comparison of antenatal and postnatal care in the intervention and control areas

In both intervention and control areas, a large proportion of antenatal and postnatal care was provided in the community. In the intervention area, the initial booking visit and any further ultrasound scans took place in a large maternity hospital located several miles away. Follow-up care was provided either at the hospital or in a local health centre. In the control area, all antenatal care was provided in a local health centre. In both communities, care was transferred to the maternity hospital if serious complications occurred.

All women participating in the study stated their intention to deliver their babies in hospital. The two hospitals involved were teaching hospitals with 4,800 and 3,600 deliveries per year in the intervention and the control hospitals respectively, (1995). There was no reason to suspect any substantial differences in terms of their support of breastfeeding. However, a national audit carried out from 1992 showed that fewer mothers (26%) in the intervention hospital were discharged breastfeeding compared to the control hospital (41%). These differences were shown to reflect the socio-economic status of the client group attending the hospital rather than hospital practices (Elton, 1994). A Glasgow audit from 1995 to 1996 demonstrated that a significantly greater proportion of women in the control hospital initiated breastfeeding when compared to the intervention hospital but that the fall-off rate was the same. Once again differences became non-significant once other variables were taken into consideration (Britten *et al.*, 1997).

In the initial stages of data collection fewer women attended the antenatal clinic in the intervention area than anticipated. Several possible causes were explored but the most likely explanation appeared to be a fall in the number of births from 1990 (when the project was planned) to 1993 (when the project was initiated), Table 6. To achieve the target intervention sample size, it became necessary to extend the intervention target area from

Easterhouse (G34) to *Greater* Easterhouse (G34 plus G33.4 and G33.5). The intervention and control areas continued to share very similar characteristics, (Appendix III, Table 1B).

Table 6 - Total number of births by postcode area

Area	1990	1991	1993
Drumchapel G15	381	415	385
Easterhouse G34	315	292	258

Source: Guthrie card data

5:3. The intervention

The intervention comprised the recruitment, training and deployment of lay support workers (Helpers) in the intervention area. Each intervention subject was allocated a Helper who maintained contact with the subject from the time of booking onwards and who undertook to visit the subject on two occasions antenatally and on two occasions postnatally.

In an area where the birth rate was approximately 300 per year, it was decided that ten counsellors would be sufficient to implement the intervention. The term *Counsellor* was deemed inappropriate and the less formal term *Helper* was adopted.

5.3.1 Recruitment of lay counsellors

A network of local women with breastfeeding experience fulfilling specified criteria were recruited and trained to provide antenatal information and postnatal support to women in the intervention area. The recruitment criteria were:

- living within the intervention area
- having at least one child under five
- having breastfed a baby for at least three months
- interested in helping other mothers to breastfeed

Health visitors in the intervention area were approached to assist with recruiting women who satisfied the above criteria. In addition, discharge records for the previous five years were obtained from the local maternity hospital. Names and addresses of women who satisfied the first two parts of the above criteria and who had been breastfeeding at discharge were recorded. These names were then passed to the local health visitors who

evaluated suitability for working with the proposed intervention. Breastfeeding in the intervention area was so uncommon that the health visitor could name individual mothers who had breastfed. Mothers interested in becoming Helpers completed a recruitment form, which was then returned to the project midwife. Thirteen women fulfilling the criteria completed and returned the form. Of these, two were unable to participate as they had returned to full time employment; the remaining 11 indicated an eagerness to participate.

5.3.2 Training of lay counsellors

The aim of the training was to provide the participants with sufficient information and skills to enable them to promote breastfeeding and to give support to breastfeeding mothers in Easterhouse.

The training programme was designed between April the 21st and August the 31st 1994 and was adapted from Jenny Warren's workshops (*The Best Breastfeeding Course*) to suit the needs of the project and Easterhouse. Information specific to Easterhouse was supplied by Elaine Wotherspoon, Parenthood Educator, through her experiences in parenthood education. Additional information was obtained from the pilot study carried out in the area in 1994.

The workshops were designed to be sufficiently flexible to incorporate the needs of each Helper and ensure that the basic subjects, thought to be essential to helping others to breastfeed, were covered. The Helpers were taught about various aspects of breastfeeding from social attitudes to anatomy and physiology, the benefits and techniques of breastfeeding as well as how to avoid some of the problems. They were taught to deliver messages about breastfeeding such as the importance of avoiding formula feeds in the first few days postnatally, and about the availability of resources and support for breastfeeding. To enable them to communicate effectively they were taught the skills essential for active listening and giving advice or support (see Appendix IV for full details of the workshops).

A similar format was used for each workshop, beginning with a recap of the previous session and finishing with a piece of work to be completed for the next workshop. This was intended to encourage participants to think of this project in terms of their everyday environment and to introduce the idea of discussing breastfeeding with people outside of the immediate family. Any "homework" was discussed at the start of the next session.

The 11 women who had completed the recruitment form were invited to attend the workshops in Easterhouse Health Centre (EHHC). Seven women attended and completed the course. Six remained after the training to carry out the intervention. After completing the training workshops, the Helpers were each supplied with a copy of the La Leche League "Questions and Answers" book (1991) and a copy of the National Childbirth Trust booklet "A guide for Counsellors".

To ensure on-going support, the Helpers attended weekly meeting where they could discuss progress, problems and relevant issues. Funding was made available to enable the Helpers to attend local conferences and workshops. This served the joint purpose of keeping the Helpers up-to-date with a rapidly changing field and encouraged greater awareness of the project among lay volunteers and health professionals.

5.3.3 Deployment of lay counsellors

The project midwife allocated study subjects to Helpers. Allocation was based on subject's age, parity and address (in an attempt to allocate Helpers to women who may have had similar experiences and who lived fairly nearby). Helpers were allocated an equal number of subjects who intended to breastfeed, bottle-feed or who were undecided. Names and addresses of subjects were distributed to the Helpers each week, along with a note of the feeding intention.

The six trained Helpers attempted to contact all antenatal women in the intervention group. Helpers were given a date by which the first visit should be conducted, i.e. before 18 weeks gestation or as soon as possible thereafter if a woman had booked late in pregnancy. This visit aimed to encourage women to think about breastfeeding. A suggested month for a return visit during the final trimester (at around 30-36 weeks of pregnancy) was also given. The second antenatal visit was arranged by mutual agreement between the Helper and study subject during the first visit. This visit provided more information on breastfeeding. It was important to have two antenatal visits in order to establish a relationship of trust and support between Helper and study subject.

After delivery, breastfeeding mothers received further support and encouragement from the Helpers by means of two further visits. Throughout this period, the Helpers offered on-going support to the intervention group, either personally or via telephone contact. The

specific support offered by the Helper included information on the benefits, practicalities and realities of breastfeeding. Intervention subjects were informed about how to initiate and maintain breastfeeding, about what might influence breastfeeding, how to involve friends and relatives. More specific issues such as the support of mothers whose babies were in Special Care, how to hand express, information on diet and drugs was made available if required (Box 6).

Box 7 - Support offered by the Helper

- Information on benefits for mother and baby
- How to breastfeed
- What breastfeeding really means for the mother
- Factors which influence breastfeeding
- How to involve friends and relatives
- Special needs
- Referral to appropriate information source
- Referral for medical advice

Where possible all four specified contacts were face-to-face. In the event of this being unsuccessful, a leaflet was left outlining the benefits of breastfeeding and giving the Helper's name and home telephone number.

Although antenatal visits were provided during distinct time periods in pregnancy (i.e. second trimester and third trimester) no such guidance was given regarding postnatal visits. It was hoped that leaving the frequency and timing of postnatal visits open would enable the Helper to respond appropriately to the mothers needs.

In order to gain experience of what the intervention involved, to share skills and experiences and to ensure personal safety, the Helpers worked in pairs. To protect the study participants, the Helpers were screened by Strathclyde Police and issued with GGHB identification passes. The Helpers received expenses to cover travel, child-care and other out of pocket expenses.

Certain procedures were in place in an attempt to standardise the support and information provided to each intervention subject. The Helpers had to fulfil selection criteria, attended a standard training programme, followed the visit protocol (Appendix V) and provided standardised written materials. The Helpers also worked in pairs and partnership was changed every two months. However, it was accepted that variations would occur and what actually took place at each visit would be dependent on the knowledge, personality and needs of both Helper and mother as well as the circumstances in which the visit took place. Assessment by an independent observer would not have been appropriate, as this would have interfered with the concept of local peer support.

Both study and control populations continued to receive conventional care and support from health professionals.

5:4. Data collection methods

To assess the impact of the intervention, data were collected from all study subjects using four questionnaires (Appendix VI), two during the antenatal period and two in the postnatal period. The questionnaires were designed to be completed by each woman at the antenatal clinics (ANC), in the postnatal wards and either in the postnatal clinic or at home. Additional information was obtained from the obstetric case notes and from health professionals. Data collection is summarised in Figure 3.

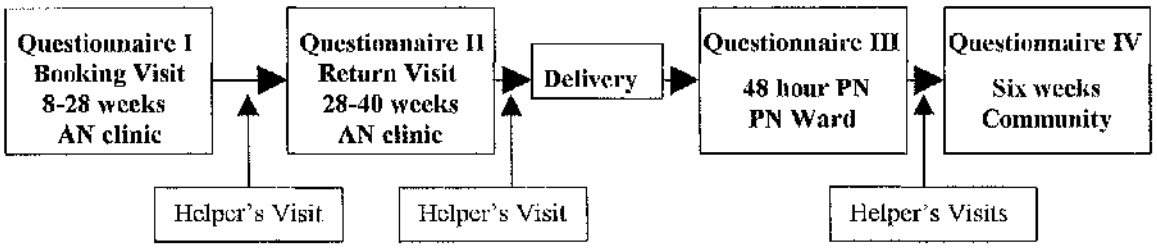


Figure 3: Summary of data collection

The antenatal questionnaires were designed to obtain data on feeding intention, influences and previous feeding behaviour. To enable comparison between the intervention and control groups, demographic details thought to influence infant feeding were also recorded. These were age, smoking habit, parity, previous breastfeeding experience, social support and domestic circumstances (i.e. living alone, with parents, partner etc.). The first questionnaire was completed in the antenatal clinic at the first (booking) visit at around eight to twelve

weeks and the second antenatal questionnaire at the return visit at around 28-32 weeks. The project assistant identified control and intervention subjects (see section 5.8) and provided assistance with completing the antenatal questionnaires if required.

The postnatal questionnaires were designed to obtain data on actual feeding behaviour and influencing factors after delivery. To enable comparison between the two groups, information was obtained about events surrounding birth and the immediate postnatal period which may have an effect on infant feeding, (e.g. type of delivery, prematurity, weight of baby, transfer of baby to Special Care Baby Unit, number of days in hospital). Data were also collected about events in the postnatal wards such as feeding problems, breastfeeding support and whether breastfed babies received artificial milk in addition to breast milk. The first postnatal questionnaire was completed in the first 48 hours and the second postnatal questionnaire at the end of the postnatal period (around six weeks). The first questionnaire was distributed by the hospital midwives and the final questionnaire by the health visitor.

5:5. Development and validation of antenatal questionnaires (Questionnaires I and II)

The following steps were taken in the process of designing of the questionnaire and in planning the approach to data collection:

5:5:1. Informal discussions with antenatal clinic attendees

As a pre-pilot study, informal visits were paid to the antenatal clinics (Easterhouse ANC, Glasgow Royal Maternity Hospital (GRMH) ANC and Drumchapel ANC) to assess the procedure during each booking visit. These visits took place over a two week period during February 1994. Eighteen women attending their first clinic appointment, who fulfilled the criteria for the main study, were invited to an informal discussion with the researcher to assess their thoughts on infant feeding and the proposed intervention. From comments made at this time a draught questionnaire was drawn up. This was then used as a key during the next stage of the development of the questionnaire.

5:5:2. Semi-structured interviews with antenatal clinic attendees

The second part of this pre-pilot study took place over a three week period from 16th-31st of March 1994, in three sites: Drumchapel Health Centre (DHC), Easterhouse Health Centre (EHHC) and GRMH. Thirty-four eligible women (18 from Drumchapel and 16 from Easterhouse) attending the antenatal clinic were invited to a semi-structured interview with the researcher. All agreed to participate. This enabled questions to be phrased more comprehensively and to probe for answers where responses were not forthcoming. The specific questions asked related to the choice of feeding method, how this choice had been made, what had influenced this decision, where information had come from, as well as a several questions on past experience. The responses given during these interviews were used to further develop the draft questionnaire.

5:5:3. Face validity

The draft questionnaire was circulated among various health professionals and lay people in order to identify errors or ambiguities. Errors detected at this stage were corrected and ambiguous questions were altered. The questionnaire was then discussed with a statistician who identified and suggested changes to questions that would have been difficult to analyse. The questionnaire now appeared complete. However, it was essential to test it on the study population both to check that it was intelligible and to determine the most appropriate method of completing the questionnaire. Several copies of the questionnaire were therefore printed and piloted in both the intervention and the control areas.

5:5:4. The pilot study

5:5:4:1. Aims

1. To identify any ambiguous or incomprehensible questions in the antenatal questionnaires
2. To identify the most frequent answers to open ended questions. This would provide the formulation of closed questions in order to make the questionnaire easier to complete and to enable storage in a database for statistical analysis.
3. To identify the most appropriate method of distributing the questionnaire

The questionnaires were piloted from the 20th-29th April 1994 in the three sites DHC, EHHC and GRMH. In all, 16 women were approached, 11 from Drumchapel and five from

Easterhouse. All agreed to complete the questionnaire and an additional form that examined the ease of completing the questionnaire.

5:5:4:2. Results of pilot study

1. Ambiguous and unintelligible questions were identified and altered.
2. Irrelevant questions were identified and discarded.
3. Open-ended questions were closed.
4. Practical problems with completing the questionnaire were identified (below).

Between the first informal visits and the pilot study, some changes had taken place in two of the clinics. The two clinic days in Drumchapel had been reduced to one resulting in a very busy clinic with less time spent with each woman. Frequent staff changes were also identified as a potential problem in ensuring the continuity of the project. These observations were relevant to subsequent decisions concerning the data collection.

5:5:5. Determination of the method of completing the antenatal questionnaires

Several unsuccessful strategies were attempted before a successful strategy was developed. It was originally intended that the antenatal questionnaires would be completed using a semi-structured interview performed by the project midwife during each clinic session. However, a number of eligible women were missed by this procedure, reasons for which included the following: busy clinics which made it not possible to identify and approach eligible participants; lack of space and privacy which was problematic during semi-structured interviews; semi-structured interviews were very time consuming. It was therefore decided that this method of data collection would not be successful.

The clinic midwives were then asked to complete the questionnaire for each of the eligible women. Because of recent and frequent staff changes, however, this proved to be unreliable. In addition, clinic midwives were very keen to promote breastfeeding, which might have resulted in a large degree of bias in the answers given by the women.

It was decided that the receptionist would distribute the questionnaire to each eligible woman who would complete it during waiting time and return it to the clinic midwife. To facilitate this, the questionnaire was re-designed to be self-completing and each question had a list of possible responses that the respondent could circle as appropriate.

Receptionists were asked to identify possible recruits by postcode area and to hand out the questionnaires when the women attended the clinic. This method resulted in a lot of extra work in already busy clinics and again many women were missed.

It was therefore necessary for an individual with a sole remit for the project to attend each clinic in order to ensure that the maximum number of eligible women was recruited. This would ensure appropriate identification of possible recruits, assistance with completing questionnaires if required, collection of questionnaires after the clinic and the return of the questionnaires to the research base. It would also provide greater feedback regarding attitudes of staff and study subjects to the data collection and the project as a whole. For these reasons, a project assistant was employed who would be responsible for recruiting eligible women and collecting initial and follow-up data.

As the pilot progressed, there were several minor changes to the grammar and the structure of the questions and a question on the *milk token scheme* was added at the request of Greater Glasgow Health Board.

The structure of the questionnaire was amended following discussions with the Information Technology (IT) Support Officer who provided assistance with creating the database. Changes were made to the questionnaire at this time to facilitate computer storage and analysis. Each form was entered into the database to identify and correct errors in the database or questionnaire and to make any other modifications required.

The final questionnaire was therefore a simple self-completion form. There was minimal writing and a choice of answers to each question was offered. As it was impossible to cover all possible responses, each question had an "other" option with a space for individual comments if required. Sample questionnaires are filed in Appendix VI.

The second antenatal questionnaire was similar to the first questionnaire but had one additional question on information on infant feeding provided during pregnancy. In the second questionnaire, the section on previous infant feeding behaviour was omitted and most of the demographic details were not repeated except where change during pregnancy was possible. As the structure and method of completing the second questionnaire was the same as for the first, it was not necessary to pilot it extensively. The questionnaire was

therefore distributed to six women in each clinic to confirm that it was comprehensible and unambiguous.

5:6. Development and validation of postnatal questionnaires (Questionnaires III and IV)

5:6:1. First postnatal questionnaire (Questionnaire III, birth to two days)

The structure of the postnatal questionnaires was the same as that of the antenatal questionnaire i.e. a form with selected responses which each respondent could choose. It was therefore not necessary to pilot the structure of the form. Due to the more complex nature of postnatal events, however, extra care was taken to ensure that the forms were clear and instructions were unambiguous. To achieve this, sample forms were first circulated around colleagues and health professionals. Thirty-one postnatal mothers (eight from the control hospital and 23 from the intervention hospital) also completed this draft of the postnatal questionnaire. As well as evaluating the content of the questionnaire and the clarity of instructions, common answers to open ended questions were sought in order to provide a choice of possible responses. This phase of the development of the postnatal questionnaire took place between the 15th July and 20th August 1994.

In the final version, closed questions were used with a list of possible responses. The responses included those obtained during the pilot study and the results of other published studies.

The final draft was circulated to 36 mothers in both the intervention (GRMH, N=18) and the control hospitals (Queen Mother's Hospital (QMH), N=18). This assessed ease of completing the forms, form errors, the return of the questionnaires from hospital to research base and potential problems transferring the data onto the database, alterations to either the form or the database were made at this time. This phase of the development of the postnatal questionnaire took place during December 1994.

It was obviously not possible at this point to assess the success of following-up study participants at delivery or to assess the method of postnatal data collection, as these could

only happen when participants delivered and reached the postnatal stage of data collection. Due to the often very short hospital stay it was decided that postnatal data collection would only be possible if the ward staff distributed questionnaires to participants while in the postnatal ward. This would avoid missing the large numbers who would deliver during evenings, nights, weekends and holidays. For this purpose, the case notes of each participant were flagged to indicate their inclusion in the study. A form was designed which would be completed by the staff at the end of the pregnancy (live birth, stillbirth or abortion). This was filed along with the questionnaire and would assist the project staff to identify mothers who would require follow-up or who had been removed from the project. The first postnatal questionnaire was due to be completed within the first two postnatal days by the participant. Each postnatal ward was visited by the researcher to inform staff members about the project and the method for the completion of the forms. This also enabled the project to be discussed and suggestions to be incorporated. A box was placed in each ward for the collection of questionnaires and a poster was displayed giving further information about the project.

5:6:2. Second postnatal questionnaire (Questionnaire IV, 6 weeks)

The six-week questionnaire aimed to assess the duration of breastfeeding and was based on the first postnatal questionnaire.

To evaluate the content and clarity of the second postnatal questionnaire, ten copies were piloted in the intervention area with the assistance of the health visitors. This took place between December 1994 and January 1995.

Collection of six-week data posed a more serious problem and assistance was sought from the project steering group. As before, it was not possible to test this method of identification and data collection until each participant progressed through the study to the six-week check. In Easterhouse, the questionnaires were sent to the health centre manager and passed onto the health visitors for completion. This effort was co-ordinated by the health centre manager and by one of the health visitors.

In Drumchapel, this approach failed and several alternatives for collecting the six-week data were explored. It was felt essential to maintain input from health care providers in order to

alert the project staff to problems such as a perinatal death or illness. Obviously, it would be very distressing for a mother in this situation to receive a questionnaire. Health care staff in contact with participants at this stage were generally the health visitor or the general practitioner (GP). As the administrative support from the health visitor co-ordinator had not been obtained, the only other option was via the GP. After discussion with the GP co-ordinator, it was decided that second postnatal questionnaires would be sent to the appropriate GP. This would be completed by the study participant at the six-week check-up. Once again it was not possible to assess the success of this method until participants had progressed through pregnancy to this point.

It was later decided that only mothers who were breastfeeding or who had attempted to breastfeed would complete the six-week questionnaire. No new information would be gained by giving the questionnaire to those who had only ever bottle-fed their baby.

5:7. Reliability of questionnaires

As this was a prospective study, which was attempting to measure change over a period of time, it was not possible to assess reliability by repeating the questionnaire at a later date. A woman's intentions in pregnancy may or may not be reflected in her behaviour and are influenced by a number of variables. It was expected that the reliability of the questionnaires in the intervention and the control groups would not differ greatly. The following paragraphs outline the measures taken to ensure that the questionnaires provided fairly reliable data.

Four subjects completed the first questionnaire twice at different stages in their pregnancy. Two women, one of whom completed the form at 14 then 22 weeks, and another at 15 then 32 weeks, provided identical information on each occasion. One woman completing the form at 10 weeks then 15 weeks provided a different reason for choosing to bottle-feed. This woman also stated at 10 weeks that she intended to give up smoking but at 15 weeks stated that she did not intend to give up smoking. This may indicate that she had been unable to stop smoking in the intervening five weeks. The other subject who completed the form at seven weeks then at 16 weeks provided several different replies: different reasons for choice of intended feeding; mentioned being involved with the intervention in the later form; stated she did not know if she would continue to smoke in earlier questionnaire but in

the later questionnaire stated intention to continue smoking; at seven weeks stated feeling unsupported in her pregnancy but stated at 16 weeks that she felt supported. Differences here may again reflect social changes occurring over time as well as interaction with the intervention.

Comparing three key questions in Questionnaire I (completed at approximately 12 weeks) with responses given in Questionnaire II (at 28-40 weeks), showed relatively consistent responses. Any differences may reflect changes in social circumstances that have occurred during pregnancy.

Question 6a. Did you smoke regularly before pregnancy? 460 subjects responded "Yes" in Questionnaire I compared to 434 in Questionnaire II (95.3% agreement)

Question 5c. Do you feel supported in your pregnancy? 742 said "Yes" on Questionnaire I compared to 693 in Questionnaire II (93.4% agreement)

Question 5a. Who do you live with? In Questionnaire I, 469 lived with partner compared to 429 in Questionnaire II (91.5% agreement); 87 lived alone in Questionnaire I compared to 55 in Questionnaire II (63.2% agreement); and 139 lived with own parents in Questionnaire I compared to 96 in Questionnaire II (69.1% agreement).

Feeding method employed at discharge recorded by the mother in Questionnaire III was compared to the feeding method recorded by hospital staff on the follow-up sheet. This sheet was completed for 72% of intervention mothers and 79% of control mothers. For those for whom this data was recorded, the method stated by the mother matched the method recorded by the health professional for 95% of intervention mothers and 98% of control. This indicates that the feeding data gathered by Questionnaire III was generally reliable.

5:8. Data collection from study subjects

5:8:1. Selection criteria for study recruits

Eligible participants were required to meet the following criteria for inclusion in the study:

- living in post code area G15 (control area), G33.4, G33.5 or G34 (intervention area).

- attending a booking visit at Drumchapel Health Centre or Glasgow Royal Maternity Hospital.
- agreed to participate in the project.

There were no exclusions at this stage. Women booking late in pregnancy, i.e. after 28 weeks, were included but were not required to complete the second antenatal questionnaire.

The following protocol was used to anticipate unexpected events in pregnancy and to keep track of the fairly mobile population:

- anyone moving out of the area but remaining within the hospital in which they booked, would be followed up at the new address where possible.
- anyone moving from the intervention area to the control area who had been exposed to the intervention, would no longer be included.
- anyone moving from the control area to the intervention area could be included in the intervention, if the move took place in the antenatal period.
- anyone moving out of the area who would no longer deliver in either of the two hospitals was removed.

Data collected from women who later aborted or whose baby was stillborn or died in the postnatal period were included up to the point where they could no longer participate. A follow-up sheet was placed in the case notes of all participants, which was designed to be completed and returned to the project staff in the event of a non-continuing pregnancy.

5:8:2. Completion of the questionnaires

5:8:2:1. Completion of Questionnaire 1 (Booking, approx. 8-12 weeks)

Eligible study recruits were identified by post-code of normal address from the booking register at each antenatal clinic by the Project Assistant. Potential recruits were then approached and verbal consent obtained. Everyone had the option to refuse. The booking visit normally took place around eight to twelve weeks gestation however, some women booked later in their pregnancy. Regardless of booking gestation, all women who met the recruitment criteria (5.8.1), completed the first questionnaire. Anyone who booked after 28 weeks however, did not complete the second questionnaire (Questionnaire I gave greater demographic details), in order to prevent duplication of data.

The first antenatal questionnaire was completed by participants during clinic waiting time. To enable follow-up, the second antenatal questionnaire and the follow-up sheet were filed in each participant's case-notes. Case notes were also marked with a red dot and labelled "Infant Feeding Research Project". A note was made of the next clinic visit. The follow-up sheet enabled identification of pregnancies that had terminated or delivered prematurely.

5:8:2:2. Completion of Questionnaire II (Return, 28-40 weeks)

The second questionnaire, to be completed at the return clinic visit (28-40 weeks), was filed in the case notes at the booking visit. Women were identified by the project assistant from the list of return dates recorded at the booking visit. Case notes were flagged to alert staff when the woman arrived for her check-up.

The second antenatal questionnaire was only completed once the pregnancy had progressed to 28 weeks or more. Once again the questionnaire was completed during waiting time.

At the time of the return visit, the first postnatal questionnaire was filed in the case notes. If any participant did not attend a return visit, the postnatal questionnaire was filed in the case notes so that it would be available at delivery. Attempts were then made to trace the next antenatal appointment.

5:8:2:3. Completion of Questionnaire III (Postnatal, 0-two days)

The first postnatal data were collected by a questionnaire distributed by the ward staff on either the second postnatal day or the day of discharge, whichever came first. Completed questionnaires were collected from the ward by the project staff. The wards in the Queen Mother's Hospital were visited daily and the wards in the Glasgow Royal Maternity Hospital were visited on a Monday, Wednesday, Thursday and Friday. Lists of study participants were distributed to the midwifery staff in each ward.

5:8:2:4. Completion of Questionnaire IV (Postnatal, approx. six weeks)

The final postnatal data were collected at around six weeks. In Easterhouse, this was initially co-ordinated by the Easterhouse Health Centre Nurse Manager who received questionnaires as they were due for completion. These questionnaires were then passed on to the health visitor who was visiting the women at home or at a clinic. The Nurse Manager left her post in 1996, therefore from that date, the questionnaires were sent to one health

visitor who agreed to co-ordinate the data collection among the other health visitors. Completed questionnaires were returned to the project co-ordinator initially via the antenatal clinics and later by post. In the later stages of data collection, the questionnaires were delivered by the Helpers, a stamped addressed envelope was provided to ensure confidentiality and return to base. In Drumchapel, questionnaires were initially sent to the GP at the time of the six-week check-up and the woman was asked to complete the questionnaire by the clinic receptionist. The completed questionnaires were returned direct to the research base in an envelope provided. Later, as this was proving unsuccessful, the questionnaires were sent direct to the appropriate health visitor who completed it with the mother and returned it in the stamped addressed envelope provided.

5:8:3. Procedure for participants who were missed

5:8:3:1. Procedure for participants missed at the return visit

If a participant was missed at her return visit, attempts were made at later clinic visits to complete the questionnaire.

5:8:3:2. Procedure for participants missed at delivery

If the first postnatal questionnaire was missed and a live, healthy birth had taken place within the previous 10 days then a questionnaire was sent out with the community midwife. If 10 days had elapsed, details regarding the birth and feeding were recorded from the case notes.

5.8.3.3 Procedure for participants missed at six weeks

If the final questionnaire was not returned by eight weeks, the GP or health visitor would be contacted by telephone or by letter. If this was unsuccessful relevant information was obtained from the community case records with the assistance of health visitors and clinic reception staff.

5:8:4. Summary of data collection

The same questionnaires were used in both the intervention and control areas. The antenatal questionnaires were distributed by the same person and completed and collected in the same manner. The first postnatal questionnaire relied upon the hospital staff. The final

questionnaire was completed slightly differently in each area, the intervention questionnaires being distributed by the health visitors and the control questionnaires by clinic receptionists.

5:9. Data processing and analysis

5:9:1. Storage of data

Data were stored in a database using the software package Microsoft Access 2.0. This database comprised of four separate tables, one for each form.

The database was copied onto floppy disks three times per week and a copy was stored outside the office.

5:9:2. Entering data

Each data table was accessed through a form. To reduce errors in entering the data, the structure and colour of each form matched the corresponding questionnaire.

The project assistant entered antenatal data into the database after each clinic and the research midwife entered postnatal data as it was made available.

There were several mechanisms built into the database that would prevent or reduce error:

- *Reference number* could only be number between 001 and 999 prefixed by a letter (i.e. E or D). No duplicates were allowed.
- *EDD* could only be between 1/1/95 and 9/9/99 or zero (the code 9/9/99 was used where someone had been withdrawn from the study, e.g. due to miscarriage)
- *Date of birth* could only be between 1/1/45 and 1/1/80 (it was accepted that 14 - 50 were the ages most likely to be pregnant).
- *Return Date* was between 1/12/94 and 9/9/99 (9/9/99 was used to indicate someone who had missed her return visit either because she wasn't eligible (e.g. booking after 24 weeks) or because she had defaulted or delivered early).
- *Date of delivery* could only be between 1/1/95 and 9/9/99 or zero (the code 9/9/99 was used where someone had been withdrawn from the study e.g. due to miscarriage)

- *Date of six-week check* was between 14/2/95 and 9/9/99 but as this was entered automatically by the computer as 'Date of Delivery plus 42 days' this would reduce error substantially.

All other data were either mutually exclusive categories where only one answer could be given or a list of choices where the respondent could circle as many as desired.

In addition, the research midwife checked all antenatal data entered by the project assistant. The research midwife re-checked all postnatal data one month after entering it into the database.

5:9:3. Analysis of data

The data were analysed using the EPI-INFO programme and with the assistance of a statistician.

Chi-squared tests were used to compare the feeding intentions or feeding behaviour of the intervention and control populations. Prevalence ratios were used to compare each group at each point in time.

Multivariate analysis based on logistic regression analyses was performed to assess whether any apparent differences or similarities between the intervention and the control group could be attributable to other underlying factors which might differ in the two areas and which were likely to affect breastfeeding.

Statistical significance was assessed at a 95% confidence interval (CI) assuming a power of 80%.

The net gain was measured to evaluate changes taking place during the time participants were in contact with the intervention. Net gain was defined as the increase in the number of those intending to breastfeed when completing one questionnaire who did not intend to breastfeed when completing the previous questionnaire, minus those who intended to breastfeed at the previous questionnaire who no longer intended to breastfeed at the current questionnaire. That is bottle-feeders and undecided from Questionnaire I who have decided to breastfeed by Questionnaire II minus the breastfeeders from Questionnaire I who have decided against breastfeeding by Questionnaire II.

5:10. Outcome measurements

At the end of two years of data collection the impact of the intervention was evaluated by comparing the intention, initiation and continuation of breastfeeding up to six postnatal weeks in each area. For the purpose of analysis, *exclusive breastfeeding* was defined as only breastfeeding, *breastfeeding* was any breastfeeding, *breast and bottle-feeding* was defined as both breast and bottle where the baby receives breast milk from the mother and formula from a bottle, while *bottle-feeding* was only bottle-feeding using formula. Other feeding methods e.g. tube, cup, expressing were noted as *other* and were specified where appropriate.

In addition to measuring actual initiation and duration of breastfeeding in each area, the project compared the proportions of subjects who *intended* to breastfeed compared with the numbers who *actually* breastfed.

The hypotheses being tested were that with greater information and support:

- more subjects in the intervention area will intend to breastfeed during pregnancy,
- more subjects in the intervention area will initiate breastfeeding
- more subjects in the intervention area will be breastfeeding at six weeks

Sub-group analysis was carried out where it was shown that there were large differences between the intervention and control group in possible confounding variables (E.g. socio-demographic characteristics, type of delivery etc.).

The intervention was also evaluated in terms of its acceptability to the women and health professionals in the area by a combination of qualitative questions, comment boxes and verbal feedback.

5:11. Qualitative data

Breastfeeding is a highly emotional and personal subject, for that reason not all the results of this project can be measured in purely quantitative terms. Where useful, quotes were recorded from staff members, local women, the breastfeeding Helpers and from anyone else

in contact with the project. These comments gave some indication of feelings or events at the time.

5:12. Ethics and confidentiality

Ethical approval was obtained from the GP Subcommittee of the Area Medical Committee, the Ethics Committee of Yorkhill NHS Trust and the Ethics Committee of the Glasgow Royal Group. The GP Subcommittee requested a question on the length of stay in postnatal wards to be added. The Ethics Committee of the Royal Group requested evidence that the project would not add to the workload of the staff. As a project assistant was employed to distribute and collect the antenatal questionnaire and as all questionnaires were self-completing, it was thought that the project would not add significantly to the workload.

Verbal consent was obtained from all women recruited onto the study and everyone approached was given the opportunity to refuse to become involved. This *opt out* option was available at all points of data collection throughout the study.

All data were stored in a password-controlled database in a format that would prevent identification of participants. Personal details were passed on only to health professionals to enable tracing women through the project. In the intervention area, names and addresses were also distributed to the Helpers after obtaining each participant's permission.

Care was taken to ensure that presentation of data could not identify individual participants.

Chapter 6:

Results

Chapter 6: Results

Altogether 995 women were recruited to participate in the project. Four hundred and seventy four of them were from the intervention community (Easterhouse) and 521 were from the control community (Drumchapel). At various stages, study subjects were removed from the project. This was generally due to natural attrition caused by abortion, perinatal death or movement out of Glasgow. The flow of participants is demonstrated in Figure 4.

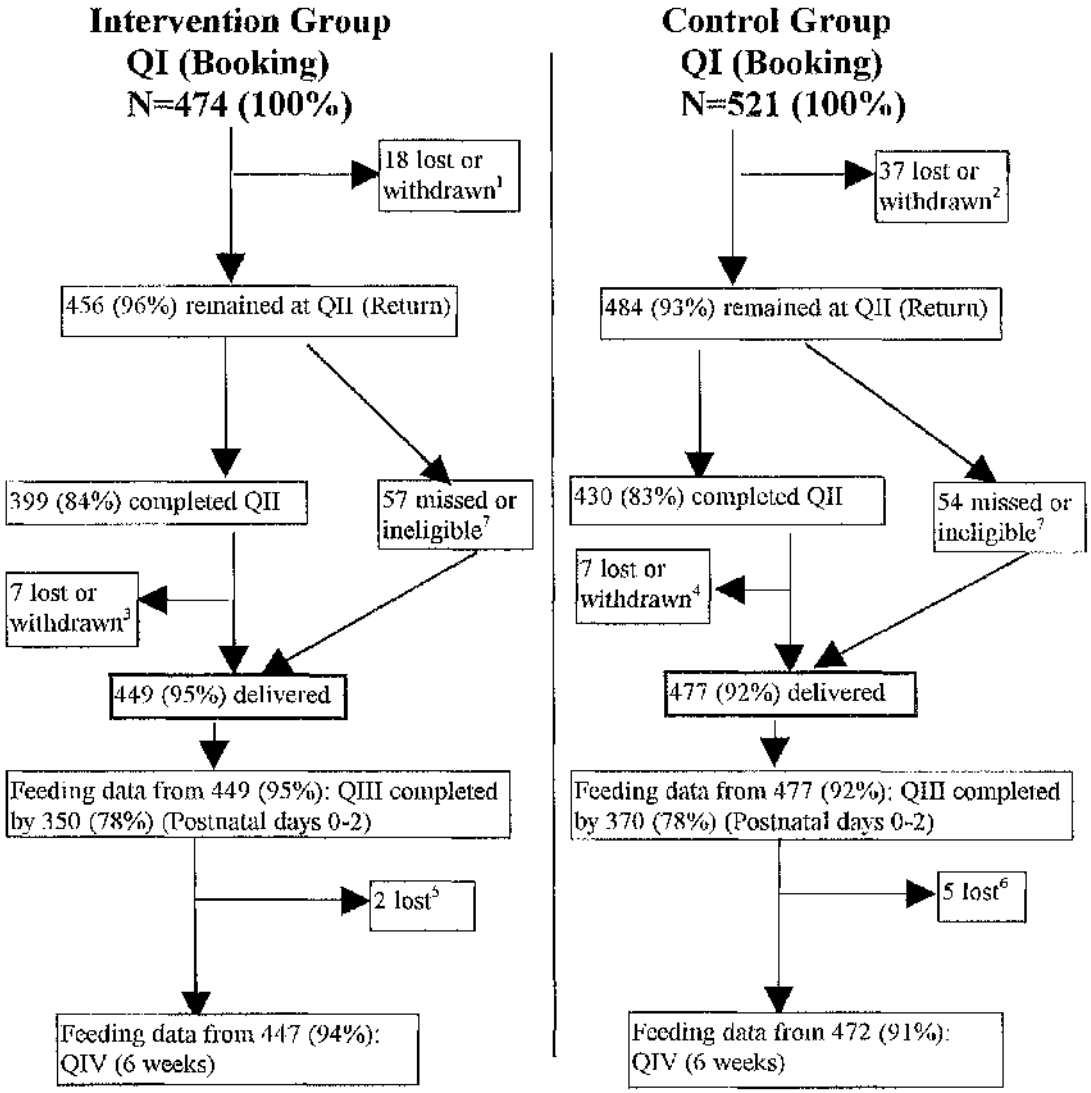


Figure 4: Flow of study participants from recruitment to six weeks postpartum

[1]Seven abortions, one neonatal death (NND), six moved away, one changed care and three were untraceable.

[2]Nineteen abortions, one NND, three stillbirths, six moved away, four changed care and four were untraceable.

[3]Two NNDs, one stillbirth, one baby adopted, one moved away and two were untraceable.

[4]Four stillbirths, two babies adopted and one moved away.

[5]Two were untraceable (both were breastfeeding at hospital discharge).

[6]Five were untraceable (all were breastfeeding at hospital discharge).

[7]A number of intervention and control subjects did not complete Questionnaire II but continued to participate in the study. The reasons for this are given in *Table 7*.

Table 7 - Reason for not completing Questionnaire II (Return)

	Intervention (N=57)	**Control** (N=54)
Missed at clinic/ did not attend clinic	26	34
Premature delivery	18	7
Late booker	9	2
DOMINO (don't attend ANC)	0	6
Changed care	1	1
Refused	0	1
Completed questionnaire but omitted question on feeding	3	3

DOMINO means domiciliary midwife in-out. This is where antenatal care is provided by a team of about 4 midwives, usually in the woman's home. The mother is then delivered in hospital by one of the four midwives and is discharged six hours after the birth.

The results are presented in accordance with the study objectives i.e.:

- To assess the feasibility of recruiting and training lay breastfeeding counsellors who have previously successfully breastfed and who live in the target area.
- To develop an acceptable and efficient means of ensuring a number of personal contacts between the local counsellors and all mothers, both antenatally and postnatally, within the target area, over a defined period of time, without duplicating or adversely affecting the delivery of routine services.
- To evaluate the intervention in the target area by assessing:

  a) its acceptability to mothers and professionals.

  b) its impact on breastfeeding intentions and frequency (up to six postnatal weeks).

6:1. Objective I: Recruitment and training of local breastfeeding counsellors (breastfeeding Helpers)

Eleven mothers who fulfilled the recruitment criteria (see 5:3) were recruited. Seven attended the training workshops and six remained to implement the intervention. Recruitment was easier than anticipated. This was due to the support from the local health professionals and possibly due to the fact that in an area where breastfeeding was so uncommon it was easy to identify individual breastfeeders.

The participants were positive about their breastfeeding experiences and appeared keen to help other women to breastfeed. They had all experienced a lack of support from their family and from health professionals during the time they had breastfed. Insufficient hospital staff and stereotyping due to area of residence had contributed to a lack of support while establishing breastfeeding. The women felt that they would have benefited from meeting other mothers who had breastfed or were breastfeeding their babies.

The level of breastfeeding knowledge among the Helpers was high and they were extremely aware of issues affecting breastfeeding and women's choices. They were keen to change attitudes and felt they would like to start with their maternity hospital and schools (two areas identified by the Helpers as having the greatest influence). They felt that this project gave something positive to Easterhouse and were glad of the opportunity to be involved.

Initially, three workshops had been planned, however the first workshop was cut short due to a bomb scare. Sessions not covered at this time were incorporated into later workshops and this caused the whole programme to run late. It also took longer than first thought to cover some sessions due to the need to address individual problems and ideas. Discussions, which were a central part of the programme, often lasted longer than anticipated but due to their spontaneous nature were more difficult to control. Five workshops were held which gave the opportunity to explore more personal issues and avoided the workshops being too rushed. The fifth workshop was a recap of the training and allowed time for administrative details.

6:1:1. Evaluation of training of helpers

To evaluate the effectiveness of the workshops a pre-test was completed on the first day and repeated as a post-test on the fourth day. This was presented to the Helpers as a quiz and comprised a number of True/False questions about the benefits, physiology and practicalities of breastfeeding. The results of this are presented in Table 8.

Table 8 - Evaluation of the Helpers' training

Candidate Number	Test 1 Correct (%)	Test 2 Correct (%)
1	49	84
2	73	86
3	90	91
4	75	91
5	48	85
6	54	84
7		79
Mean	64.9	85.6

Wilcoxon Signed Ranks Test: p=0.04

There was a statistically significant increase in knowledge ($p<0.05$) after the training as measured by the pre- and post-test results. The results from the first test were higher than expected. However, after completing the training the class average had increased from 65% to 86% (Candidate 3 did not continue to work with the group after training was completed).

At the end of the course an evaluation form was completed. Participants stated that they were generally satisfied with the workshops and felt that they had been appropriately equipped to implement the proposed intervention.

The participants also stated that one of the biggest gains from the workshops was getting to know each other and giving mutual support. Several participants suggested that future workshops should include more role-play and open discussions. One woman would have liked the course to run for a longer period and another suggested that more of these workshops should be run all over the country to create more public awareness.

6:1:2. Ongoing support and training of Helpers

After the initial training, the Healthy Cities Project (a global campaign to promote health and prevent disease, initiated by the W.H.O. and based on the concept of "Health for All") funded further courses on assertiveness, communication skills and committee skills. All of these enabled the Helpers to work together more professionally and created awareness about personal communication needs and the need to respect the individual.

The Helpers were encouraged to attend information sessions and conferences in order to keep informed about breastfeeding. Refresher training was held in 1996 (on communication and assertiveness) and 1997 (on breastfeeding).

6:2. Objective II - Ensuring stipulated number of contacts between Helpers and study recruits

6:2:1. Antenatal visits by helpers

The majority of study subjects in the intervention area received at least one antenatal visit (*Table 9*).

Three subjects recruited to the intervention requested not to be visited by the Helpers but agreed to complete the questionnaires. They all stated an intention to bottle-feed and one woman gave a "medical reasons" for doing so. These women were not allocated to the Helpers and are not included in the following tables.

Table 9 - Antenatal visits to intervention subjects

	Intervention subjects (N=471) No. (%)
Visited at home	312 (66.2)
Visited at Health Centre	22 (4.7)
Not visited	137 (29.1)

Three hundred and twelve subjects were visited at home by a breastfeeding Helper, *Table 9*. A total of 1521 antenatal visits were carried out in an attempt to contact study subjects. Of these visits, 504 (33%) were face-to-face with the study subjects, *Table 10*.

The project protocol stipulated two antenatal visits per person. However, a number of mothers (51% of those visited) received only one visit while one mother received five visits. Two home visits were made to 37% of the mothers visited. Fewer than two visits were made either as a result of difficulties in contacting individual mothers or because the mother was satisfied with the information received during the first visit and requested not to have a second visit. More than two visits were made where a mother was very interested in breastfeeding but was unsure of her decision and seemed to respond positively to the visits. The intervention remained sufficiently flexible to enable the Helpers to respond to individual need. A total of 1017 visits (67%) were made which were not face-to-face with the study subjects but may have enabled discussion with other family members. An average of 2.5 unsuccessful visits were made per subject, the range was one to seven, *Table 10*.

Table 10 - Distribution of antenatal visits

	Visits to intervention subjects (Total=1521)		
	No. (%)	**Average per person**	**Range**
Successful visits	504 (33.1)	1.6	1-5
Unsuccessful visits	1017 (66.9)	2.5	1-7

It often took several attempts to make initial contact with members of the study population. A number of reasons were noted for this; most commonly, no-one was at home when the Helper called (48% of those not contacted). If there was no answer and the Helper was sure of the address, a leaflet was left outlining the benefits of breastfeeding. This leaflet also gave a contact number for the helpers who had called.

If only the study subject was not present (17% of those not contacted), the Helpers took this opportunity to speak to other members of the family and left a leaflet for the mother.

The Helpers stated that sometimes there was someone in the house but no-one answered the door. Their local knowledge led them to comment that many residents were suspicious of strangers. This seemed to become less of a problem as the Helpers became better known.

Nine subjects refused visits (7% of the 137 not contacted). Comments made by the mothers at this time suggested that they were strongly opposed to breastfeeding.

Incomplete, incorrect or change of address (13% of those not contacted), was mainly caused by relocation of residents to allow building work. In addition to this the population appeared to be fairly mobile. Some mothers moved between partner and parent and others were in the process of being re-housed.

Due to the difficulties in contacting study subjects, it was decided that the Helpers should visit each woman three times in the early stages of pregnancy in an attempt to make one face to face contact. A final visit near the end of pregnancy was either by arrangement or in an effort to meet the study woman.

Although the Helpers did not intend to favour breastfeeders or those who were undecided, slightly more antenatal visits were made to those two categories, *Table 11* and *Table 12*.

Table 11 - Antenatal visits in relation to feeding intention at booking

Feeding intention at booking	**Number visited** (%) (N=334)
Breast (N=86)	68 (79.1)
Undecided (N=108)	85 (78.7)
Bottle (N=278)	179 (64.4)

Two participants stated feeding intention as "other"

Table 12 - Antenatal visits in relation to feeding intention at return

Feeding intention at Return	**Number visited** (%) (N=328)
Breast (N=94)	79 (84.0)
Undecided (N=29)	26 (89.7)
Bottle (N=276)	185 (67.0)
Unknown (N=57)	38 (66.7)

Fewer subjects were recorded in Table 11 due to loss of participants, see Figure 4.

During antenatal visits, the Helpers gained the impression that there were four groups of women with distinct characteristics:

1. The bottle-feeders who were definitely not interested. They received one visit.

2. The bottle-feeders who were undecided. They might breastfeed if living in a supportive environment but unfortunately usually lacked support from immediate family.

3. The breastfeeders who were undecided. They would breastfeed but required a lot of support and encouragement. They would be easily dissuaded and often had insufficient support.

4. The breastfeeders who were determined to breastfeed. They usually lived in a supportive environment and would probably breastfeed without the help of the study.

Groups 2 and 3 were more likely to be encouraged to breastfeed by the project and to respond to positive support. They were also more likely to be deterred if undermined by unhelpful remarks or given inappropriate advice.

It was assumed that individual Helpers would have an equal effect on the mothers since attempts had been made to standardise the visits. To establish if this was the case, the net gain in breastfeeding between booking and return was analysed for each Helper. The net

gain is the number of mothers stating an intention to breastfeed at the return visit who did not intend to breastfeed at the booking visit minus those who did intend to breastfeed at booking but stated an intention not to breastfeed at return. To ensure confidentiality each Helper was randomly allocated a number.

Table 13 - Breastfeeding percentage gain by Helper

Helper	Net Gain (expressed as a percentage of the total visits where the Helper was involved)	
1	(4/57)	7.0%
2	(15/194)	7.7%
3	(6/155)	3.9%
4	(8/180)	4.4%
5	(6/160)	3.8%
6	(5/155)	3.2%

While Helpers 3-6 performed equally, Helpers 1 and 2 appeared more successful in increasing the breastfeeding intention. However, there were no statistically significant differences between Helpers performance ($\chi 2=5.56$, 5 DF, $p=0.35$), *Table 13*.

6:2:2. Postnatal visits by helpers

The project protocol stipulated two visits to each mother during the postnatal period. During the planning year however, it was decided that it would not be beneficial to visit women who were bottle-feeding. Instead, these visits should be used to support breastfeeding mothers or to find out why those who intended to breastfeed had not initiated breastfeeding or had given up prematurely.

A total of 406 postnatal visits were carried out to postnatal mothers. Of these visits 306 (75%) were successful in contacting the mother. Three breastfeeding mothers declined to be visited but requested support by telephone. One breastfeeder refused any support.

Women visited postnatally were usually at home and appeared pleased to be visited. The majority of visits were to breastfeeding mothers. Eighty-five percent of breastfeeders were visited; of whom 93% were at home at the time of visit. Seventy-five percent of mothers who were combining breast and bottle-feeding received a visit; of whom 92% were at home at the time of visit. Of the mothers who were bottle-feeding on discharge from the hospital, 17% were visited and 79% of them were at home at time of visit, *Table 14*.

Table 14 - Distribution of postnatal visits by feeding method.

Feeding on discharge from hospital	Number visited (%)	Average number of visits per person	Range of visits
Breastfeeding (N=66)	56 (84.9)	4.2	1-15
Breast and bottle (N=16)	12 (75.0)	1.8	1-4
Bottle-feeding (N=395)	67 (17.0)	1.3	1-6

Fifteen percent of breastfeeders were not visited. There were a number of reasons for this including: Helper not notified of birth, mother had moved address, baby was sick and health staff had requested them not to be visited, mother had stated she had sufficient support and preferred not to be visited.

The number of supportive visits given to mothers varied widely and appeared to be dependent on the needs of the mother and the commitment of the Helper. Those who received only one or two visits were generally either breastfeeders with sufficient home support to be able to breastfeed with minimal intervention, or were breastfeeders who had given up by the time the Helper visited. In general, breastfeeding mothers required more than two visits and frequently required additional telephone contact.

Seventeen percent of bottle-feeders received a visit. The majority of them were mothers who had stated antenatally that they intended to breastfeed. The Helpers called on these mothers to try to establish why breastfeeding had not been initiated or had ceased prior to discharge. These postnatal visits were useful because they highlighted some of the barriers that prevented successful breastfeeding. A smaller number of postnatal visits to bottle-feeders were actually intended as antenatal visits but the mother had delivered prematurely and the Helper had not been informed.

One bottle-feeding mother who received six postnatal visits had attempted to breastfeed but changed to bottle-feeding before discharge from hospital. The mother wished to re-establish lactation and this was achieved with the assistance of the Helper. Although the mother did not continue to breastfeed for long, she stated that she was happier with her decision to stop as it had been her choice rather than imposed by circumstances.

To establish whether postnatal support was equal among the Helpers, the breastfeeding initiation and continuation was assessed for each Helper. The net gain was the increase in mothers breastfeeding from return to delivery (i.e. those who initiated breastfeeding

contrary to antenatal intention minus those who did not initiate breastfeeding despite an intention to breastfeed). To enable comparison, this was expressed as a percentage of the total number of mothers each Helper was involved with.

Table 15 - Breastfeeding gain from return to delivery

Helper	Breastfeeding Gain (Return to Delivery).	
1	(+1/47)	+2.1%
2	(-1/168)	-0.6%
3	(+3/134)	+2.2%
4	(-1/158)	-0.6%
5	(+1/138)	+0.7%
6	(-6/134)	-4.5%

There were no great differences between Helpers in the gain in breastfeeding from the return visit to delivery. Helpers 1 and 3 were most successful while Helper 6 was least successful. However the numbers are very small in each case, *Table 15*.

Performance at sustaining breastfeeding following delivery was also assessed. Due to a steady reduction in breastfeeding following delivery the results which follow are negative and are expressed as a percentage of the total breastfeeding mothers each Helper was involved with, *Table 16*.

Table 16 - Breastfeeding loss following delivery by Helper

Helper	BF loss (Delivery-discharge)		BF loss (discharge-six weeks)	
1	(-4/9)	-44.4%	(-3/5)	-60.0%
2	(-10/49)	-20.4%	(-19/37)	-51.3%
3	(-8/32)	-25.0%	(-9/24)	-37.5%
4	(-12/40)	-30.0%	(-12/27)	-44.4%
5	(-7/39)	-18.0%	(-15/30)	-50.0%
6	(-5/39)	-12.8%	(-15/34)	-44.1%

The sample sizes between delivery/discharge and six weeks are not equal due to loss of subjects.

There were differences between Helpers relating to the loss of breastfeeding subjects however, the differences were small and were not statistically different. Helpers 5 and 6 were more successful between delivery and discharge and Helpers 3,4 and 5 were more successful between discharge and six weeks, *Table 16*.

Thus differences in breastfeeding gains or losses between Helpers were small and inconsistent and probably related to the characteristics of the study subjects rather than the Helpers, *Table 13*, *Table 15* and *Table 16*.

6:3. Objective IIIa - Evaluation of the effectiveness of the intervention in terms of its acceptability to mothers and professionals

6:3:1. Acceptability to mothers

Verbal consent was obtained from every subject recruited to the project. During the two years only two subjects declined to participate: a clinic midwife rather than the project assistant had approached both of these women. In addition subjects had the option to participate in the data collection but could decline visits. Only three women requested not to be visited and only one of them appeared to object strongly to the project. In the course of the intervention a further nine women requested that the Helpers did not return after making a first visit. Where visits were refused the subject had made a definite decision to bottle-feed. One women appeared to be annoyed at being visited and stated quite emphatically that *"I don't want strangers coming anywhere near my door"*.

Specific questions pertaining to the acceptability of the study were asked in the postnatal questionnaire. These questions were not well completed with only 260 (74% of completed questionnaires) stating that they had been visited by a Helper and a number of other questions were left blank, *Table 17*:

Table 17 - Responses to Question 12 (Questionnaire III)

N=260	Yes No. (%)	No No. (%)	Don't know /blank No. (%)
12Ba. I had already decided feeding method before I met the Helper	191 (73.5)	45 (17.3)	24 (9.2)
12Bb. I decided to breastfeed because of the information she gave me	25 (9.6)	121 (46.5)	114 (43.9)
12Bc. The information the Helper gave me was useful	151 (58.1)	16 (6.2)	93 (35.8)
12Bd. I enjoyed being visited by the Helper	140 (53.9)	18 (6.9)	102 (39.2)

The results in Table 17 are difficult to interpret due to the lack of complete data. The majority of mothers had decided on feeding method prior to being visited by the Helper and only a few (10%) stated that the Helper had influenced their breastfeeding decision.

However, only a small proportion stated that they had not found the visit either useful (6%) or enjoyable (7%).

Comments from mothers such as "*I didn't realise you were a mother, or I'd have let you in*", or "*You're very approachable and down to earth*", seem to indicate that intervention subjects found it not only acceptable but advantageous that other mothers, rather than health professionals, should be promoting breastfeeding.

One grandmother who stated that she thought the project was a good idea then asked "*Where were you when I was breastfeeding all those years ago?*"

On another occasion, a friend of one of the study participants who lived in another area of Glasgow commented on how good the project was and asked why it wasn't available where she lived. Conversely the partner of one woman accused the Helpers of harassing his girlfriend and equated the Helpers with religious zealots. In this case the study subject had expressed an interest in breastfeeding.

It therefore appears that the Helpers and their visits were generally acceptable to pregnant women within the intervention community. During the course of the intervention, the Helpers stated that gaining access to peoples' homes became easier which may have indicated that the local community was becoming more accepting of the Helpers.

As an indication of the acceptance of the group by hospital based health professionals, the Helpers were invited to assist with running breastfeeding workshops in Glasgow Royal Maternity Hospital (GRMH). These workshops were designed to educate mothers and midwives about the importance and the practicalities of breastfeeding. In recognition of their knowledge and ability, the Helpers were then invited in to GRMH on a Thursday morning to support and encourage any breastfeeding mother.

Finally, the consultant obstetrician after some initial scepticism gave the intervention his whole hearted support. He acknowledged that more mothers were attempting to breastfeed. He also acknowledged that the initiative had been beneficial for the Helpers themselves. In recognition of this, he invited the Helpers to attend his outreach antenatal clinic in EHHC to offer information and encouragement to antenatal women.

To summarise, as the Helpers progressed both in time and experience they appeared to become increasingly acceptable to the mothers, their families and to the health professionals.

6:4. Objective IIIb - Impact on breastfeeding duration and frequency up to six postnatal weeks

6:4:1. Overview of the study

To evaluate the impact of the intervention on breastfeeding behaviour, data were collected and analysed from the intervention area subjects and from the control area subjects. Data were collected by four self-completing questionnaires: these were distributed at antenatal booking (12-13 weeks), clinic return (after 28 weeks), after delivery (postnatal day 0-2) and at the end of the postnatal period (six weeks). Events at delivery were recorded on Questionnaire III which was completed on, approximately, the second postnatal day.

Data presented in parts 6:4:4 to 6:4:6 represent the data collected for all the subjects recruited to the intervention and the control groups. The results of sub-group analysis (part 6:4:7) should be interpreted with caution since they are not based on the sample size calculations which enabled statistical analysis. Worthy of further note is the subgroup of deprivation category. This study was intended to target a disadvantaged community selected by postcode of residence and compare it to a similarly disadvantaged control community. However, later analysis of postcode sectors revealed that a proportion (13%) of the control group resided in a more affluent postcode sector. It was postulated that this might have resulted in a Type II error where a positive effect within the intervention community was masked by a similar trend within the more affluent section of the control community. Because the numbers of this sub-group were small (69), it was believed that this was unlikely to be the case. However, when the data was re-analysed omitting the more affluent control sub-group, significant differences were noted between the intervention and the control group – see section 6:4:7:1.

6:4:2. Comparison of the intervention and control groups

A comparison of demographic variables and census data of the two communities demonstrated that they were broadly similar (Appendix III). In addition, data on certain variables that are thought to influence infant feeding were collected by Questionnaire I (*Table 18*).

Table 18 - Social and demographic data from Questionnaire I

	Intervention (N=474)	**Control** (N=521)
1. Average age: (range)	25 (15-39)	25 (15-41)
2. Regular smoker: No. (%)	293 (61.8%)	326 (62.6%)
3. Living with partner: No. (%)	304 (64.1%)	326 (62.6%)
4. Mean no. of children per subject	1.7	1.8
5. Primiparous: No. (%)	206 (43.5%)	211 (40.5%)
6. Previous breastfeeding experience: No. (%)	47 (9.9%)	64 (12.3%)
7. Receive milk tokens: No. (%)	188 (39.7%)	214 (41.1%)
8. Living in Depcat 7: No. (%)***	473 (99.8)	452 (86.8)

***** RR = 1.15 CI (1.11, 1.19), p<0.0001 (Yates corrected)**

Depcat = Deprivation category (based on a model devised by Carstairs and Morris (1991), where category 1 is the most affluent and category 7 is the most deprived).

Chi-squared analysis of variables 2, 3, 5, 6 and 7 revealed no significant differences between the intervention and control groups at the time of completing Questionnaire I. However, there were slightly more primigravida in the intervention group suggesting that this group may be more receptive to change. On the other hand, more of the control group had previous breastfeeding experience suggesting that they might be more likely to breastfeed again: *Table 18*.

Analysis of Variable 8 (deprivation category) revealed that significantly more intervention than control subjects lived in an area of extreme deprivation. The influence of deprivation score on breastfeeding is recorded in *Table 22* and *Table 23* and in section 6.4.7.1.

The feeding intentions and behaviour of primigravid and multigravid subjects are recorded section 6.4.7.3.

Variables 1 and 4 are further analysed in *Table 19* and *Table 20*.

Table 19 - Distribution of study subjects by maternal age

	Intervention No. (%) (N=474)	**Control** No. (%) (N=521)
< 20 years	97 (20.5)	106 (20.3)
20-24 years	148 (31.2)	163 (31.3)
25-29 years	129 (27.2)	149 (28.6)
≥ 30 years	95 (20.0)	101 (19.4)

Five intervention and two control subjects did not record date of birth

The distribution of subjects by maternal age was not significantly different in the intervention and control groups: *Table 19*.

Table 20 - Distribution of number of children per subject: No. (%)

	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Intervention (N=474)	206 (43.5)	151 (31.9)	69 (14.6)	33 (7.0)	9 (1.9)	4 (0.8)	2 (0.4)	0
Control (N=521)	211 (40.5)	164 (31.5)	82 (15.7)	45 (8.6)	11 (2.1)	3 (0.6)	3 (0.6)	2 (0.4)

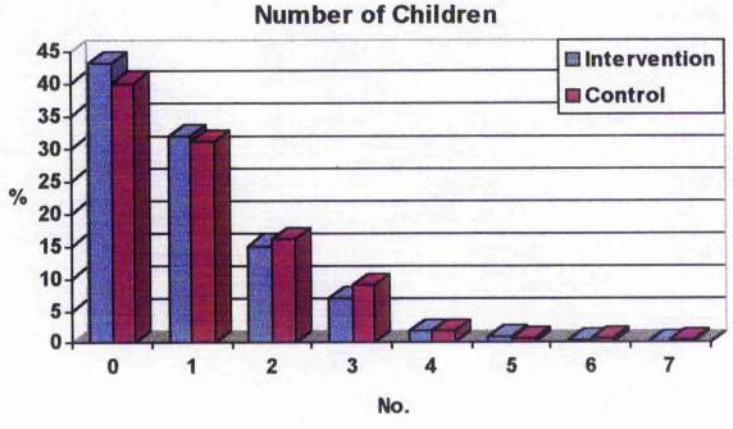


Figure 5: Number of Children

The number of children was equally distributed in the intervention and control groups: *Table 20* and *Figure 5*.

Events surrounding the birth are known to influence the success of breastfeeding. Questionnaire III collected details of such events: *Table 21*.

Table 21 - Birth events from Questionnaire III

	Intervention (N=449) No. (%)	**Control** (N=477) No. (%)
Normal delivery (SVD)	314 (69.9)	339 (71.1)
Caesarean section (CS) +	79 (17.6)	64 (13.4)
Premature delivery (<36 weeks)	22 (4.9)	16 (3.4)
Low birthweight (LBW) baby (<2.5kg)	42 (9.4)	37 (7.8)
Admitted to SCN ***	109 (24.3)	69 (14.5)
Attended antenatal class	127 (28.3)	157 (32.9)
Attended breastfeeding workshops	22 (4.9)	19 (4.0)

SVD = Spontaneous Vertex Delivery, CS = Caesarean Section, LBW = Low Birthweight, SCN = Special Care Nursery.

+ Relative Risk (RR) 1.31, 95% Confidence Interval (CI) (0.97, 1.78), p=0.08 (NS),

***** RR 1.68, 95% CI (1.28, 2.20), p<0.001**

There were some differences between the intervention and the control group at the time of delivery. Babies in the intervention group were significantly more likely to be admitted to Special Care Nursery (SCN) than control group babies ($p<0.001$). The incidence of Caesarean section (CS), premature delivery, and low birthweight (LBW) were all slightly higher in the intervention group but none of these were statistically significant. These variables (SCN, CS and LBW) have been associated with an increased probability of bottle-feeding or a reduced duration of breastfeeding. Attendance at antenatal classes was higher in the control group and antenatal class attendance is generally associated with increased breastfeeding: *Table 21.*

6:4:2:1 Relationship between recorded variables and intention to breastfeed and the initiation of breastfeeding.

Table 22 - Comparison of variables and intention to breastfeed (intervention and control group combined)

	Intended to BF	Intended not to BF	Chi squared analysis
1. Previous breastfeeding experience	56	54	RR 4.41 (3.23, 6.02)
No Previous breastfeeding experience	54	414	$\chi 2$=89.65, p<0.0001
2. Attended breastfeeding workshop	27	14	RR 3.69 (2.84, 4.79)
No workshop	158	727	$\chi 2$=56.47, p<0.0001
3. Living with partner	149	481	RR 1.8 (1.33,2.42)
Not living with partner	48	317	$\chi 2$=16.05, p<0.0001
4. Regular smoker	101	515	RR 0.63 (0.49, 0.81)
Non smoker	96	277	$\chi 2$=12.98, p<0.001
5. Receive milk tokens	58	344	RR 0.62 (0.47, 0.82)
No tokens	135	448	$\chi 2$=11.51, p<0.001
6. Depcat 7	174	752	RR 0.56 (0.39, 0.81)
Not depcat 7	23	46	$\chi 2$=8.55, p<0.01
7. Attended antenatal class	70	213	RR 1.38 (1.06, 1.79)
No antenatal class	115	526	$\chi 2$= 5.66, p<0.05
8. Caesarean section (CS)	34	109	RR1.24 (0.9, 1.72)
Not CS	148	626	$\chi 2$=1.65, p=0.2
9. Admitted to SCN	42	136	RR 1.23 (0.91, 1.67)
Not admitted to SCN	143	605	$\chi 2$=1.8, p=0.2
10. Continued smoking in pregnancy	71	367	RR 0.81 (0.50, 1.30)
Stopped smoking in pregnancy	17	68	$\chi 2$= 0.73, p=0.4
11. Primiparous	87	330	RR 1.1 (0.85, 1.41)
Multiparous	110	468	$\chi 2$=0.5, p=0.5
12. Normal delivery (SVD)	126	527	RR 0.91 (0.69, 1.20)
Not SVD	56	208	$\chi 2$=0.4, p=0.5
13. Premature delivery (<36 weeks)	9	29	RR 1.19 (0.67,2.15)
Term delivery (>36 weeks)	176	712	$\chi 2$=0.34, p=0.6
14. Low birthweight (LBW) (<2.5kg)	16	59	RR 1.05 (0.67, 1.66)
Baby weighing >2.5Kg	166	653	$\chi 2$=0.00, p=0.9

The variables positively associated with breastfeeding intention were previous experience of breastfeeding ($p<0.0001$) and living with a partner ($p<0.0001$). The variables which were negatively associated with breastfeeding intention were smoking ($p<0.001$), receiving milk tokens ($p<0.001$) and living in a deprived area ($p<0.01$). Breastfeeding intention was also associated with attending a breastfeeding workshop ($p<0.0001$) and attending antenatal classes ($p<0.05$) which suggested that women who intended to breastfeed were more likely to attend these classes; *Table 22*.

Table 23 - Comparison of variables and initiation of breastfeeding at delivery (intervention and control group combined)

	Initiated BF	Did not initiate BF	Chi squared analysis
1. Previous breastfeeding experience	55	46	RR 4.79 (3.48, 6.58)
No Previous breastfeeding experience	49	382	$\chi2$=96.59, p<0.0001
2. Attended breastfeeding workshop	35	6	RR 4.61 (3.82, 5.56)
No workshop	164	721	$\chi2$= 1.3.74, p<0.0001
3. Regular smoker	98	480	RR 0.58 (0.46, 0.74)
Non smoker	101	245	$\chi2$=19.18, p<0.0001
4. Receive milk tokens	52	314	RR 0.54 (0.4, 0.72)
No tokens	143	399	$\chi2$=19.21, p<0.0001
5. Living with partner	153	432	RR 1.95 (1.43,2.62)
Not living with partner	46	295	$\chi2$=20.48, p<0.0001
6. Attended antenatal class	81	203	RR 1.55 (1.23, 1.98)
No antenatal class	118	524	$\chi2$= 12.0, p<0.001
7. Depcat 7	176	683	RR 0.6 (0.42, 0.85)
Not depcat 7	23	44	$\chi2$=7.06, p<0.01
8. Continued smoking in pregnancy	65	363	RR 0.61 (0.39, 0.94)
Stopped smoking in pregnancy	21	63	$\chi2$= 4.84, p<0.05
9. Primiparous	95	299	RR 1.23 (0.96, 1.58)
Multiparous	104	428	$\chi2$=2.79, p=0.1
10. Low birthweight (LBW) (<2.5kg)	9	86	RR 0.56 (0.3, 1.07)
Baby weighing >2.5Kg	138	682	$\chi2$=2.89, p=0.1
11. Premature delivery (<36 weeks)	9	29	RR 1.11 (0.62,1.99)
Term delivery (>36 weeks)	178	630	$\chi2$=0.11, p=0.2
12. Normal delivery (SVD)	134	519	RR 0.88 (0.68, 1.16)
Not SVD	61	202	$\chi2$=0.8, p=0.4
13. Caesarean section (CS)	34	109	RR 1.14 (0.82, 1.57)
Not CS	162	612	$\chi2$=0.6, p=0.4
14. Admitted to SCN	39	139	RR 1.02 (0.75, 1.40)
Not admitted to SCN	143	605	$\chi2$=0.02, p=0.9

At delivery, all but one of the variables which appeared to influence the initiation of breastfeeding were the same as the variables which influenced antenatal intention, therefore the association of breastfeeding with these variables actually reflects antenatal intention. Women who gave up smoking in pregnancy were significantly more likely to breastfeed ($p<0.05$) than women who continued to smoke in pregnancy, however this was not significantly related to breastfeeding intention.

Table 21, *Table 22* and *Table 23* indicate that there may be important subgroups worthy of further analysis. Admission to SCN was significantly different between the intervention and control groups and the proportions delivered by CS were nearly significant. Although there was no difference in the proportions of primigravida and multigravida in each group it was postulated that the primigravid subjects might be more receptive to the intervention because

they lacked personal infant feeding experience. Older mothers might be more likely to breastfeed and mothers of different age groups may respond differently to the intervention. Attendance at antenatal classes significantly influenced breastfeeding initiation but this may be a reflection of antenatal intention. It was decided to look more closely at the influence of antenatal classes because it was likely that teaching content and methods were not standardised between the two areas. Thus the subgroups of maternal age, parity, type of delivery, admission to SCN, and attendance at antenatal classes were identified. In addition, a proportion of the intervention group did not receive any visits, (*Table 11*, *Table 12* and *Table 14*) therefore a comparison of the intervention group that was visited with the intervention group that was not visited is recorded at the end of the subgroup section. The effect of these variables on breastfeeding is recorded in section 6.4.7.

Because a significantly greater proportion of the control group lived in a more affluent area, it was decided to further analyse the influence of deprivation category. It was not possible to analyse the effect of the intervention in different deprivation areas because the entire intervention group lived in one type of area. However, it was possible to compare the influence of the intervention with a similarly deprived control area by omitting the control subjects residing in a more affluent depcat sector (section 6:4:7:1).

6:4:3. Presentation of data on infant feeding

Infant feeding data will be presented in the following order:

Part 6.4.4 records data collected at each point of data collection i.e. Questionnaire I at booking, Questionnaire II at return, Questionnaire III at hospital discharge (also includes information about delivery and feeding at delivery) and Questionnaire IV at six weeks. A summary of this is given in the summary section 6.4.8.

Part 6.4.5 compares the data collected from one questionnaire with the subsequent questionnaire i.e. Questionnaire I with Questionnaire II, Questionnaire II with Questionnaire III (Delivery), Questionnaire III (Delivery) with Questionnaire III (discharge), and Questionnaire III (discharge) with Questionnaire IV. A summary of this is given in the summary section 6.4.8.

Part 6.4.6 compares antenatal feeding intention with postnatal feeding behaviour, i.e. Questionnaire I with Questionnaire III (delivery and discharge) and Questionnaire IV, Questionnaire II with Questionnaire III (discharge) and Questionnaire IV. A summary of this is given in the summary section 6.4.8.

Part 6.4.7 examines the influence of selected variables on feeding intention and behaviour, i.e. 1. Deprivation Category; 2. Maternal age; 3. Parity (primigravida versus multigravida); 4. Type of delivery; 5. Admission of baby to SCN; 6. Attendance at antenatal classes; 7. Intervention group visited compared to intervention group not visited. A summary of each variable is given in the summary section 6.4.8.

Part 6.4.8 is a summary of each of the preceding parts i.e. 6.4.4-6.4.7.

Multivariate analyses are presented in part 6.4.9.

Key finding are recorded on the final page of the results section, part 6.4.10.

Result presented for the intervention group are on an "intention to treat" basis. Analysis of the intervention group subjects who did not receive peer support is presented in section 6.4.7.7.

6:4:4. Results from Questionnaires I-IV

6:4:4:1. Feeding intention at booking (Questionnaire 1)

The first questionnaire was designed to determine feeding intention in early pregnancy prior to any contact with the intervention or with health professionals.

Table 24 - Questionnaire I: feeding intention at booking (approx. 12-13 weeks)

	Total subjects No. (%)	**Breast** No.(%)	****Bottle** No.(%)	*****Undecided** No.(%)	**Other** No. (%)
Intervention	474 (100)	86 (18.1)	278 (58.6)	108 (22.8)	2 (0.4)
Control	521 (100)	111 (21.3)	353 (67.8)	57 (10.9)	0

****RR 0.87, 95% CI (0.79, 0.95), p<0.01**

***** RR 2.08, 95% CI (1.55, 2.80), p<0.001**

Significantly more intervention than control mothers were undecided in their choice of feeding ($p<0.001$). Only 77% of the intervention subjects had made a choice about intended feeding method compared to 89% of the control: *Table 24.*

Significantly more control than intervention mothers intended to bottle-feed ($p<0.01$): *Table 24.*

There was no significant difference between the proportions of the intervention and control groups intending to breastfeed. As a proportion of the whole group, fewer of the intervention population (18%) intended to breastfeed than the control population (21%). However, if the proportion intending to breastfeed is expressed as a proportion of those who had made a choice about feeding then the proportions are fairly similar (23% of the intervention subjects compared to 24% of the control subjects): *Table 24.*

6:4:4:2. Feeding intention at return (Questionnaire II)

By late pregnancy, a higher proportion of both groups (approximately 93%) had made a definite decision on how they intended to feed: *Table 25.*

Table 25 - Questionnaire II: feeding intention at return (after 28 weeks gestation)

	Breast No.(%)	**Bottle** No.(%)	**Undecided** No.(%)	**Other** No. (%)	[1]**Unknown** No.
Intervention (N=399, excluding unknown)	94 (23.6)	276 (69.2)	29 (7.3)	0	57
Control (N=430, excluding unknown)	91 (21.2)	305 (70.9)	31 (7.2)	3 (0.7)	54

[1]"Unknown" are participants who did not complete Questionnaire II (see Table 7).

$\chi 2=0.61$, p=0.7, 2 degrees of freedom, NS

Chi-squared analysis showed no significant differences in feeding intention at the return visit. More of the intervention group stated an intention to breastfeed (24%) compared to the control group (21%). If the proportion intending to breastfeed is expressed as a proportion of the group who had made a definite decision, then 25% of the intervention, compared to 23% of the controls, intended to breastfeed: *Table 25.*

6:4:4:3. Feeding method from delivery to hospital discharge (Questionnaire III)

Questionnaire III, which was completed prior to hospital discharge, collected information on feeding method at delivery as well as feeding method at time of completing the questionnaire.

Table 26 - Questionnaire III: feeding method at delivery

	Number breastfeeding (%)	**Number bottle-feeding** (%)
Intervention (N=449)	105 (23.4)	344 (76.6)
Control (N=477)	94 (19.7)	383 (80.3)

RR = 1.19, 95% CI (0.93, 1.52), p=0.2, NS

At delivery more of the intervention group subjects (23%) initiated breastfeeding than control group subjects (20%) but this difference was not statistically significant: *Table 26.*

The average hospital stay was 2.9 days in the intervention group hospital and 2.7 in the control group hospital. The average stay for intervention group exclusive breastfeeders was 3.4 days, while bottle-feeders and subjects combining breast and bottle-feeding were 2.8 and 2.6 days respectively. The average stay for control group breastfeeders was 3.0, while bottle-feeders and subjects combining breast and bottle-feeding were 2.6 and 2.5 days respectively. Chi-squared analysis for linear trend demonstrated that breastfeeding mothers

had significantly longer hospital stays in both the intervention ($p<0.01$) and the control ($p<0.05$) groups. The feeding method of study participants at discharge from hospital is shown in *Table 27*.

Table 27 - Questionnaire III: feeding method at discharge from maternity hospital.

	Exclusive breastfeeding No.(%)	*Both breast & bottle No.(%)	[1]Any breastfeeding No.(%)	Exclusive bottle-feeding No.(%)
Intervention (N=449)	66 (14.7)	16 (3.6)	82 (18.3)	365 (81.1)
Control (N=477)	65 (13.6)	4 (0.8)	69 (14.5)	408 (85.5)

Two intervention subjects recorded feeding as "other"(i.e. naso-gastric feeding)

[1]Any Breastfeeding = exclusive breastfeeding plus breastfeeding combined with bottle-feeding

*** RR = 3.37, 95% CI (1.18, 9.60), p<0.05 (Yates Corrected)**

Almost equal proportions of the intervention and control populations were exclusively breastfeeding their babies at discharge from the maternity hospital. However, a higher but statistically non-significant (RR 1.27, 95% CI (0.95,1.70), p=0.1) proportion of intervention mothers were providing some (any) breastmilk (18%) than control mothers (15%). A significantly higher proportion of the intervention group was combining breastfeeding and bottle-feeding ($p<0.05$). However the number in the control group was very small: *Table 27*.

A number of mothers who were exclusively breastfeeding at hospital discharge had given their babies a bottle-feed while in hospital. Twenty-four (36%) intervention mothers and 15 (23%) control mothers had given a bottle-feed at some time during their hospital stay. Statistical analysis demonstrated no significant difference in the frequency of breastfed babies receiving bottle-feeds between the intervention and the control groups.

6:4:4:4. Feeding method at six weeks (Questionnaire IV)

By six weeks the proportions of participants who were breastfeeding in both the intervention and control groups, were greatly reduced (*Table 28*).

Table 28 - Questionnaire IV: feeding method at 6 weeks

	Exclusive breastfeeding No.(%)	**Both breast & bottle** No.(%)	**Any breastfeeding** No.(%)	**Exclusive bottle-feeding** No.(%)
Intervention (N=447)	37 (8.3)	6 (1.3)	43 (9.6)	401 (89.7)
Control (N=472)	25 (5.3)	11 (2.3)	36 (7.6)	436 (92.4)

Three intervention subjects recorded feeding as "other" (i.e. naso-gastric feeding)

There were no statistically significant differences between the control and the intervention groups in proportions breastfeeding or exclusively breastfeeding at six weeks. However, a greater proportion of the intervention population were exclusively breastfeeding (8%) than the control population (5%), (RR 1.57, 95% CI (0.96, 2.57), p=0.07). The proportion of babies receiving some breastmilk was slightly higher in the intervention group (10%) than the control group (8%), (RR 1.27, 95% CI (0.83, 1.94), p=0.3): *Table 28*.

There were no statistically significant differences at six weeks when comparing feeding method to length of hospital stay in either intervention group (p=0.4) or control group (p=0.2) mothers who were breastfeeding at hospital discharge.

There was also no statistically significant difference in the feeding behaviour at six weeks of the mothers who were exclusively breastfeeding at discharge when comparing the occasional use of bottle-feeds to non-use of bottle-feeds in hospital (p=0.7 and p=0.9 for the intervention and the control groups respectively).

For a summary of this data see section 6.4.8.

6:4:5. Sequential comparison of Questionnaires I-IV

To evaluate changes taking place during the time participants were in contact with the intervention, data from questionnaires were compared sequentially.

6:4:5:1. Comparison of Questionnaire I with Questionnaire II

Table 29 - Comparison of feeding intention at booking (Questionnaire I) with return (Questionnaire II).

		Q II Feeding Intention at return (after 28 weeks)				
	QI: Feeding intention (Booking)	**Breast** No. (%)	**Bottle** No. (%)	**Undecided** No. (%)	**Other** No. (%)	**Unknown** No.
Inter-vention (N=399)	**Breast** (N=71)	62 (87.3)	6 (8.4) [a]	3 (4.2) [b]	0 [c]	13
	Bottle (N=239)	13 (5.4) [d]	219 (91.6)	7 (2.9)	0	27
	Undecided (N=87)	18 (20.7) [e]	51 (58.6)	18 (20.7)	0	17
	Other (N=2)	1 [f]	0	1	0	0
Control (N=430)	**Breast** (N=88)	68 (77.3)	15 (17.0) [a]	2 (2.3) [b]	3 (3.4) [c]	15
	Bottle (N=296)	12 (4.1) [d]	268 (90.5)	16 (5.4)	0	35
	Undecided (N= 46)	11 (23.9) [e]	22 (47.8)	13 (28.3)	0	4

"Undecided" = those who had not made a choice about feeding, "Unknown" = those who did not complete questionnaire/question. The numbers in column 2 differ from Table 24 due to attrition of sample size and to a number of subjects not completing Questionnaire II.

Net gain = (d+e+f)-(a+b+c)

***Intervention net gain versus control net gain: Point estimate: 5.1%; 95% CI (0.8, 9.4)%, p<0.05**

There was a statistically significant net gain in the number of those intending to breastfeed between booking and return of 23 (6%) in the intervention group and three (1%) in the control group ($p<0.05$). The difference was largely attributable to a greater number of intervention mothers (87%) maintaining their original intention to breastfeed compared to 77% of the control: *Table 29* (see also *Table 70*).

The changes in intention from bottle or undecided at booking to breast at return were not statistically significant: *Table 29*.

There were no significant differences between the intervention and control "unknown" group with regards to intending to breast or bottle-feed at booking. However, a statistically significant greater proportion of intervention "unknowns" were undecided at booking compared to the control unknown group. This may reflect the original sample at booking (see *Table 24*).

6:4:5:2. Comparison of Questionnaire II with Questionnaire III (delivery)

Table 30 - Comparison of feeding intention at return (Questionnaire II) with feeding at delivery (Questionnaire III).

		Q III: Initiated breastfeeding at delivery	
	Q II: Feeding intention at return	**Yes** No. (%)	**No** No. (%)
Intervention (N= 392 completed Q II & Q III)	**Breast** (N=92)	75 (81.5)	[d]17 (18.5)
	Bottle (N=271)	[a]10 (3.7)	261 (96.3)
	Undecided (N=29)	[b]3 (10.3)	26 (89.7)
(N=57 completed Q III not Q II)	**Unknown** (N=57)	17 (29.8)	40 (70.2)
Total Delivered (N=449)		**105 (23.4)**	**344 (76.6)**
Control (N=423 completed Q II & Q III)	**Breast** (N=91)	69 (75.8)	[d]22 (24.2)
	Bottle (N=298)	[a]1 (0.3)	297 (99.7)
	Undecided (N=31)	[b]11 (35.5)	20 (64.5)
	Other (N=3)	[c]2	1
(N=54 completed Q III not Q II)	**Unknown** (N=54)	11 (20.4)	43 (79.6)
Total Delivered (N=477)		**94 (19.7)**	**383 (80.3)**

Net gain = (a+b+c)-d

There were no statistically significant differences between the intervention and control group when comparing feeding intention towards the end of pregnancy with feeding method at delivery.

A higher proportion of intervention (82%) compared to control mothers (76%) who intended to breastfeed towards the end of pregnancy (return) carried out their intention: *Table 30*.

Over 96% of intervention and control mothers who intended to bottle-feed towards the end of pregnancy carried out their intention. However, more of the intervention mothers (4%) who intended to bottle-feed initiated breastfeeding when compared to control mothers (0.2%): *Table 30*.

Most of the intervention and control mothers (77%) who remained undecided towards the end of pregnancy chose to bottle-feed at delivery. However, when comparing the two groups only 10% of undecided intervention mothers initiated breastfeeding compared to 36% of control mothers, but the numbers in each group are small (3 and 11 respectively): *Table 30*.

The net gain in the numbers intending to breastfeed at return to initiating breastfeeding at delivery was -4 (-1%) of the intervention compared to -8 (-2%) of the control. The loss was largely attributable to the subjects who stated an intention to breastfeed at the return visit but did not initiate breastfeeding at delivery.

If the population who did not complete Questionnaire II were considered (i.e. the group who were "unknown"), then only 13 of the "unknown" intervention group originally intended to breastfeed (*Table 29*), but 17 initiated breastfeeding (*Table 30*). Fifteen of the "unknown" control group intended to breastfeed (*Table 29*), but only 11 actually initiated breastfeeding (*Table 30*). At delivery therefore the net gain for the whole intervention group was zero compared to -12 (-2.5%) for the whole control group.

6:4:5:3. Comparison of Questionnaire III (delivery) with Questionnaire III (discharge)

Between delivery and discharge, there was a reduction in the proportion of breastfeeders in each group (*Table 31*).

Table 31 - Comparison of feeding method at delivery (Questionnaire III) with discharge (Questionnaire III).

		Q III: Feeding method on discharge			
	Q III: Feeding at delivery	**Breast** No. (%)	***Both** No. (%)	[1]**Any breast** No. (%)	**Bottle** No. (%)
Intervention (N=449)	**Breast** (N=105)	66 (62.9)	*16 (15.2)	82 (78.1)	23 (21.9)
	Bottle (N=344)	0	0	0	342 (99.4)
Control (N=477)	**Breast** (N=94)	65 (69.1)	*4 (4.3)	69 (73.4)	25 (26.6)
	Bottle (N=383)	0	0	0	383 (100)

[1]Two intervention subjects who were bottle-feeding at delivery stated feeding method as "other" (i.e. naso-gastric feeding) at discharge.

[1]Any breast includes exclusive breastfeeding and breast combined with bottle-feeding

*** RR 2.98, 95% CI (1.04, 8.54), p<0.05**

In both the intervention and the control groups the numbers of mothers breastfeeding fell dramatically between delivery and discharge from the hospital. In the intervention group only 63% of those who started breastfeeding were exclusively breastfeeding at discharge. This compares with the control group where 69% of those who started breastfeeding were exclusively breastfeeding at discharge. A statistically significantly greater proportion of the

intervention (15%) than the control (4%) population who were breastfeeding at discharge were combining breastfeeding with bottle-feeding at discharge ($p<0.05$). However, the number in the control group was very small at this stage. At discharge, more of the intervention babies (78%) who started breastfeeding were receiving some breastmilk when compared to control babies (73%), however this is not statistically significant (RR 1.06, 95% CI (0.91, 1.25), p=0.4): *Table 31*.

6:4:5:4. Comparison of Questionnaire III (discharge) with Questionnaire IV (six postnatal weeks)

Between discharge and six weeks, there was a further dramatic reduction in the proportion of mothers breastfeeding: *Table 32*.

Table 32 - Comparison of feeding method at discharge (Questionnaire III) with six weeks (Questionnaire IV).

		Q IV: Feeding at 6 weeks			
	Q III: Feeding at discharge	**Breast** No. (%)	**Both** No. (%)	**Any Breast** No. (%)	**Bottle** No. (%)
Inter-vention (N=447)	**Breast** (N=64)	34 (53.1)	4 (6.3)	38 (59.4)	26 (40.6)
	Both (N=16)	3 (18.8)	2 (12.5)	5 (31.3)	11 (68.8)
	Any Breast (N=80)	37 (46.3)	6 (7.5)	43 (53.8)	37 (46.3)
	Bottle (N=365)	0	0	0	364 (99.7)
Control (N=472)	**Breast** (N=60)	25 (41.7)	10 (16.7)	35 (58.3)	25 (41.7)
	Both (N= 4)	0	1 (25.0)	1 (25.0)	3 (75)
	Any Breast (N=64)	25 (39.1)	11 (17.2)	36 (56.3)	28 (43.8)
	Bottle (N=408)	0	0	0	408 (100)

One intervention subject discharged bottle-feeding stated feeding at six weeks as "other", two intervention subjects discharged with feeding method as "other" were still "other" at six weeks

By six weeks, just over 53% of intervention mothers who were exclusively breastfeeding at discharge from hospital were exclusively breastfeeding at six weeks compared to 42% of the control mothers (p=0.5): *Table 32*.

Only 43 (54%) intervention and 36 (56%) control subjects discharged from hospital providing any breastmilk (exclusive breast and breast combined with bottle) were still providing any breastmilk at six weeks: *Table 32*.

The majority of subjects (69% intervention compared to 75% control subjects) discharged from hospital combining breast and bottle-feeding were exclusively bottle-feeding at six weeks. Three of the intervention mothers who had been discharged combining breast and bottle-feeding were exclusively breastfeeding at six weeks. Numbers are too small to enable meaningful statistical analysis: *Table 32*.

For a summary of this data see section 6.4.8.

6:4:6. Comparison of antenatal feeding intention with postnatal feeding behaviour

The comparison of antenatal intention with subsequent behaviour may identify the effect of the intervention in changing behaviour. It may also indicate how strong a predictor intention was for subsequent behaviour.

6:4:6:1. Comparison of feeding intention at booking with postnatal feeding behaviour

Antenatal intention recorded at booking (Questionnaire I) was compared with feeding method at delivery, discharge and six weeks (Questionnaires III and IV).

Table 33 - Comparison of feeding intention at booking (Questionnaire I) with feeding behaviour at delivery (Questionnaire III).

			Q III: Initiated breastfeeding at delivery	
	Q1: Feeding intention at booking		**Yes**	**No**
Intervention (N=449)	***Breast**	(N=82)	*67 (81.7)	15 (18.3)
	Bottle	(N=262)	16 (6.1)	246 (93.9)
	Undecided	(N=103)	21 (20.4)	82 (79.6)
	Other	(N=2)	1	1
	Total	*(N=449)*	**105 (23.4)**	**344 (76.6)**
Control (N=477)	***Breast**	(N=103)	*66 (64.1)	37 (35.9)
	Bottle	(N=325)	11 (3.4)	314 (96.6)
	Undecided	(N=49)	17 (34.7)	32 (65.3)
	Total	*(N=477)*	**94 (19.7)**	**383 (80.3)**

*** RR 1.28, 95% CI (1.07, 1.52), p<0.01 (Mantel-Haenszel)**

A significantly higher proportion of intervention mothers (82%) who intended to breastfeed at booking carried out their intention compared to control mothers (64%), (p<0.01): *Table 33.*

Over 94% of mothers who intended to bottle-feed at booking carried out their intention. Only 20% of undecided intervention mother initiated breastfeeding compared to 35% of control mothers. This difference was not statistically significant (p=0.08, Yates Corrected): *Table 33.*

Table 34 - Comparison of feeding intention at booking (Questionnaire I) with feeding method at discharge (Questionnaire III).

	QI: Feeding intention at booking	Q III Feeding at discharge			
		Breast No. (%)	**Both** No. (%)	***Any breast** No. (%)	**Bottle** No. (%)
Inter - vention (N=449)	***Breast** (N=82)	46 (56.1)+	10 (12.2)	56 (68.3) *	25 (30.5)
	Bottle (N=262)	6 (2.3)	3 (1.1)	9 (3.4)	252 (96.2)
	Undecided (N=103)	14 (13.6)	3 (2.9)	17 (16.5)	86 (83.5)
	Other (N=2)	0	0	0	2
Control (N=477)	***Breast** (N=103)	47 (45.6) +	3 (2.9)	50 (48.5) +	53 (51.5)
	Bottle (N=325)	9(2.8)	0	9 (2.8)	316 (97.2)
	Undecided (N=49)	9 (18.4)	1 (2.0)	10 (20.4)	39 (79.6)

Two intervention subject (one who intended to breastfeed and one to bottle-feed at booking) stated feeding method at discharge as "other".

***RR 1.42, 95% CI (1.11, 1.82) p<0.01.**

+ RR 1.24 95%CI (0.94, 1.65), p=0.1 NS)

A significantly higher proportion of intervention group subjects (68%) who intended to breastfeed at booking were breastfeeding at hospital discharge when compared to the control group (48%), p<0.01. A higher, but not statistically significant proportion of the intervention group (56%), who intended to breastfeed at booking, were also exclusively breastfeeding at discharge when compared to the control group (46%): *Table 34.*

A higher proportion of the control group who were originally undecided were breastfeeding (20%) or exclusively breastfeeding (18%) at discharge when compared to the intervention group where 16% were breastfeeding and 14% exclusively breastfeeding at discharge but the number in each group are very small: *Table 34.*

Table 35 - Comparison of feeding intention at booking (Questionnaire I) with feeding method at six weeks (Questionnaire IV).

	QI: Feeding intention at booking	Q IV Feeding at 6 weeks			
		*Breast No. (%)	Both No. (%)	*Any breast No. (%)	Bottle No. (%)
Inter - vention (N=447)	**Breast** (N=80)	*26 (32.5)	6 (7.5)	*32 (40.0)	47 (58.8)
	Bottle (N=262)	4(1.5)	0	4 (1.5)	256 (97.7)
	Undecided (N=103)	7 (6.8)	0	7 (6.8)	96 (93.2)
	Other (N=2)	0	0	0	2
Control (N=472)	**Breast** (N=100)	*17 (17.0)	9 (9.0)	*26 (26.0)	74 (74.0)
	Bottle (N=324)	3 (0.9)	1(0.3)	4 (1.2)	320 (98.8)
	Undecided (N=48)	5 (10.4)	1 (2.1)	6 (12.5)	42 (87.5)

Three intervention subjects stated feeding method at 6 weeks as "other", one intended to breastfeed and two intended to bottle-feed at booking.

*** Exclusive breastfeeding: RR 1.94, 95%CI (1.13, 3.31), p<0.05 (Yates corrected)**

*** Any breastfeeding: RR 1.56, 95% CI (1.02, 2.38), p<0.05 (Mantel Haenszel)**

Significantly more intervention mothers (40%) who stated an intention to breastfeed at booking were breastfeeding at six weeks compared to control mothers (26%). Also, a significantly higher proportion of intervention mothers (32.5%) who stated an intention to breastfeed at booking were exclusively breastfeeding at six weeks when compared to control mothers (17%): *Table 35*.

Fewer intervention mothers (7%) who were undecided at booking succeeded in breastfeeding to six weeks when compared to the control mothers (12.5%). However, this was not statistically significant, RR 0.54, 95%CI (0.19, 1.53), p=0.4.

The majority of mother who stated an intention to bottle-feed at booking were bottle-feeding at six weeks (98% of the intervention group and 99% of the control group): *Table 35*.

6:4:6:2. Comparison of feeding intention at the return visit with postnatal feeding method.

Antenatal intention in late pregnancy may provide a more accurate indication of subsequent breastfeeding behaviour than antenatal intention in early pregnancy.

Antenatal intention at the return visit was compared to feeding method at delivery in *Table 30*.

Table 36 - Comparison of feeding intention at return (Questionnaire II) with feeding method at discharge (Questionnaire III).

		Q III Feeding at discharge			
	Q II: Feeding intention at return	**Breast** No. (%)	**Both** No. (%)	**Any breast** No. (%)	**Bottle** No. (%)
Intervention (N=392)	**Breast** (N=92)	51 (55.4)	12 (13.0)	[a]63 (68.5)	29 (31.5)
	Bottle (N=271)	1	1	2 (0.7)	269 (99.3)
	Undecided (N=29)	1 (3.4)	1 (3.4)	2 (6.9)	27 (93.1)
	Unknown (N=57)	13 (22.8)	2 (3.5)	15 (26.3)	40 (70.2)
Control (N=423)	**Breast** (N=91)	47 (51.6)	3 (3.3)	[a]50 (54.9)	41 (45.1)
	Bottle (N=298)	1(0.3)	0	1 (0.3)	297 (99.7)
	Undecided (N=31)	7 (22.6)	0	7 (22.6)	24 (77.4)
	Other (N=3)	2	0	2	1
	Unknown (N=54)	8 (14.8)	1 (1.9)	9 (16.7)	45 (83.3)

Two intervention mothers who were unknown at Questionnaire II stated feeding at discharge as "other"

[a]RR = 1.25, 95% CI (0.99,1.57), p=0.1 (NS)

There were no statistically significant differences between the intervention and the control group when comparing feeding intention at return visit with feeding method at hospital discharge.

A higher proportion of intervention group mothers (69%) who stated an intention to breastfeed at the return visit were breastfeeding at discharge when compared to control mothers (55%), p=0.1. A slightly higher proportion of intervention group mothers (55%) who stated an intention to breastfeed at return were exclusively breastfeeding at discharge, when compared to control mothers (52%): *Table 36*.

A higher proportion of the control group who were undecided at return were exclusively breastfeeding (23%) at discharge, when compared to the intervention group (7%

breastfeeding and 3% exclusively breastfeeding on discharge). However, the numbers in the undecided groups were very small at this stage: *Table 36.*

Feeding intention at return appeared to a more accurate predictor of those who would be bottle-feeding at hospital discharge (over 99%) when compared to intention in early pregnancy (over 96%). In the intervention group, intention to breastfeed at booking was comparable with intention to breastfeed at return in predicting breastfeeding at discharge (56% at booking and return). However, in the control group intention to breastfeed at return was a stronger predictor of breastfeeding at discharge than the intention to breastfeed at the beginning of pregnancy (46% at booking compared to 52% at return): *Table 33* and *Table 36.*

Table 37 - Comparison of feeding intention at return (Questionnaire II) with feeding method six weeks (Questionnaire IV).

		Q IV: Feeding method at 6 weeks			
	Q II: Feeding intention at return	**Breast** No. (%)	**Both** No. (%)	**[1]Any breast** No. (%)	**Bottle** No. (%)
Inter - vention (N=447)	**Breast** (N=90)	26 (28.9)	5 (5.6)	31 (34.4)	59 (65.6)
	Bottle (N=271)	1 (0.4)	0	1 (0.4)	270 (99.6)
	Undecided (N=29)	0	0	0	29 (100)
	Unknown (N=57)	10 (17.5)	1 (1.8)	11 (19.3)	43 (75.4)
Control (N=472)	**Breast** (N=87)	18 (20.7)	9 (10.3)	27 (31.0)	60 (69.0)
	Bottle (N=298)	0	0	0	298 (100)
	Undecided (N=30)	3 (10.0)	0	3 (10.0)	27 (90.0)
	Other (N=3)	1	1	2	1
	Unknown (N=54)	3(5.6)	1(1.9)	4 (7.4)	50 (92.6)

Three intervention subjects who were "unknown" at Questionnaire II stated feeding at 6 weeks as "other".
[1]Any breast includes exclusive breastfeeding and breast combined with bottle-feeding

Few subjects of either group who intended to breastfeed at return succeeded in breastfeeding to six weeks (34% of intervention subjects and 31% of control subjects). A higher proportion of intervention subjects (29%) who stated an intention to breastfeed at return were exclusively breastfeeding at six weeks compared to the control subjects (21%), p=0.2: *Table 37.*

Subjects who stated an intention to bottle-feed at return were very likely to be bottle-feeding at six weeks (almost 100% of the intervention and the control). Only one mother from the intervention group who stated an intention to bottle-feed at return was still breastfeeding at six weeks: *Table 37.*

None of the intervention subjects who were undecided at return were breastfeeding at six weeks despite three (10%) initiating breastfeeding at delivery (Table 25). However, three (10%) control subjects who were undecided at return were exclusively breastfeeding at six weeks: *Table 37*.

Compared to feeding intention at booking, feeding intention at return was a stronger predictor for feeding at six weeks for mother intending to bottle-feed (over 99% of those intending to bottle-feed at return were bottle-feeding at six weeks compared to over 97% intending to bottle-feed at booking). Mothers who remained undecided at return were also more likely to be bottle-feeding at six weeks (95%) than mothers who were undecided in early pregnancy (91%): *Table 35* and *Table 37*.

An intention to breastfeed at booking as stated by intervention group mothers was a stronger predictor of behaviour at six weeks than an intention to breastfeed stated at return (40% of those intending to breastfeed at booking compared to 34% of those intending to breastfeed at return). The opposite was true for the control group; 26% of those intending to breastfeed at booking compared to 31% of those intending to breastfeed at return were breastfeeding at six weeks: *Table 35* and *Table 37*.

A summary of the behaviour of those subjects intending to breastfeed at booking and those intending to breastfeed at return is given in summary section 6.4.8

6:4:7. Feeding intention and behaviour in selected sub-groups

Participants making up the control and intervention samples varied as individuals. Thus within each group there were important subgroups which may have responded differently to the intervention. The main subgroups identified in this study were:

6.4.7.1 Deprivation Category

6.4.7.2 Maternal age

6.4.7.3 Parity (primigravida or multigravida)

6.4.7.4 Type of delivery

6.4.7.5 Admission of baby to SCN

6.4.7.6 Attendance at antenatal classes

6.4.7.7 Intervention group visited versus not visited

Reasons for selection of sub-groups:

1. Control subjects from a more affluent background may have contributed to a Type II Error.

2. Older mothers tend to be more likely to breastfeed. It was postulated that the intervention might have a different effect on mothers of different age groups.

3. Primigravida are less likely to be influenced by established feeding practices and so may be more receptive to the intervention.

4. A larger proportion of intervention group mothers was delivered by CS. Although type of delivery was not shown to influence infant feeding in this study, other studies have associated CS with a reduced initiation and duration of breastfeeding.

5. Separation of mother and baby is associated with a reduced initiation and duration of breastfeeding. A significantly greater proportion of babies born to intervention group mothers was admitted to the Special Care Nursery (SCN).

6. Attendance at antenatal class was significantly associated with breastfeeding intention and behaviour. As the classes attended by both groups were likely to differ it was decided to examine the effect of these classes on breastfeeding behaviour.

7. The results for this study are presented on an "intention to treat" basis. However, it is possible that the intervention group subjects who were not visited behaved differently from the intervention group subjects who were visited.

The subgroup sizes for variables 2-7 do not lie within the sample size calculated to enable statistical calculations, therefore the results for these subgroups must be treated with caution. Any positive results suggest the need for further research. The subgroup size for the first variable (deprivation category) lies within the calculated sample size therefore the results for this subgroup are more statistically robust. However, this was a community-based study therefore removing part of the community is not practical in real terms. Since the issue of deprivation category only affected the control area it was possible to analyse the data in an attempt to exclude a Type II Error. The results for subgroup 1 should still be viewed with caution and indicate the need for further research.

6:4:7:1 Deprivation Category

The intervention group resided in a socio-economically disadvantaged urban area, which was defined by postcode sectors as Deprivation Category 7 (Depcat 7 – most deprived, Carstairs and Morris, 1991). The majority of the control group (87%) also resided in a postcode sector defined as Depcat 7. However, the small number of control subjects residing in Depcat 4 may have affected the results since deprivation category was significantly associated with antenatal intention to breastfeed and postnatal breastfeeding *Table 22* and *Table 23*.

Breastfeeding intention and behaviour in the intervention group was compared with the control group residing in Depcat 7 for each questionnaire.

Table 38 - Proportions planning to provide or providing any breastmilk (Depcat 7)

	Q I **Intending to BF** (booking)	**Q II** **Intending to BF** (return)	**Q III** ***Initiated BF** (delivery)	**Q III** ***Any BF** (discharge)	**Q IV** **Any BF** (6 weeks)
Intervention No. (%)	86/474 (18.1)	94/399 (23.6)	105/449 (23.4)	82/449 (18.3)	43/447 (9.6)
Control No. (%)	88/452 (19.5)	72/370 (19.5)	71/410 (17.3)	51/410 (12.4)	25/406 (6.2)
Prevalence ratio					
Point estimate	0.93	1.21	1.35	1.47	1.56
95% CI	(0.71,1.22)	0.92,1.59)	(1.03, 1.77)	(1.06, 2.03)	(0.97, 2.51)
p-value	0.61	0.17	0.03*	0.02*	0.06

Table 39 - Proportions providing only breastmilk (Depcat 7)

	Q III **Exclusive BF** (discharge)	**Q IV** ***Exclusive BF** (6 weeks)
Intervention No. (%)	66/449 (14.7)	37/447 (8.3)
Control No. (%)	49/410 (12.0)	18/406 (4.4)
Prevalence ratio		
Point estimate	1.23	1.87
Confidence interval	(0.82, 1.86)	(1.01, 3.47)
p-value	0.3	0.03*

BF = breastfeeding

A significantly greater proportion of the intervention group initiated breastfeeding ($p<0.05$) and was breastfeeding at hospital discharge ($p<0.05$) when compared to control subjects from a similarly deprived background. The proportions breastfeeding at six weeks were not significantly different when comparing the two groups. However, a significantly greater

proportion of intervention subjects were exclusively breastfeeding at six weeks ($p<0.05$) compared to control subjects, *Table 38* and *Table 39*.

The sequential changes between subsequent questionnaires were also analysed.

Table 40 - Net gain in the intention to breastfeed or breastfeeding between sequential questionnaires (QI-QIV) for Depcat 7.

	*Booking to return	Return to delivery	Delivery to discharge	Discharge to 6 weeks
Intervention	+5.8%	-1.0%	-5.1%	-8.3%
Control	+0.3%	-1.7%	-4.9%	-5.4%
Point Estimate	+5.5%	+0.6%	-0.3%	-2.9%
95% CI	(1.1, 9.9)%	(-3.3, 4.6)%	(-3.2, 2.7)%	(-6.2, 0.5)%
p-value	0.01*	0.75	0.86	0.10

Significantly more intervention mothers stated a change in their feeding intention in favour of breastfeeding between booking and return ($p<0.05$). The results recorded in *Table 40* are similar to those resulting from a comparison of the intervention group with the entire control group, see *Table 69*.

6:4:7:2. Maternal age and feeding

To evaluate the influence of maternal age on feeding intention and behaviour, study subjects were grouped into five categories according to age at booking. The influence of maternal age on antenatal feeding intention is shown in *Table 41*. For distribution of subjects in age categories see also *Table 19*.

Table 41 - Antenatal intention to breastfeed at booking and maternal age

	Intervention		Control	
Age (years)	**Total** (No.)	**Breast** No. (%)	**Total** (No.)	**Breast** No. (%)
1. **<20**	97	14 (14.4)	106	20 (18.9)
2. **20-24** *	148	16 (10.8)	163	33 (20.2)
3. **25-29**	129	27 (20.9)	149	35 (23.5)
4. **≥30**	95	27 (28.4)	101	23 (23.0)

Two intervention subjects one in category 2 and one in category 4 stated feeding intention as "other"; five intervention and two control subjects did not record their age.

***RR 0.53, 95% CI (0.31,0.93), p<0.05**

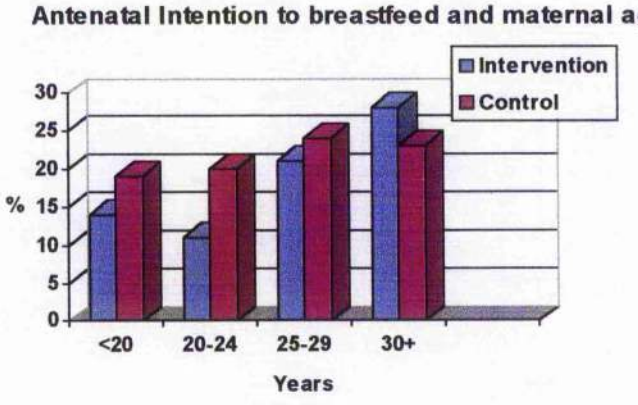


Figure 6: Antenatal intention to breastfeed and maternal age

Significantly fewer intervention subjects aged between 20-24 intended to breasted than control subjects ($p<0.05$). Figure 6 demonstrates a slight trend where intention to breastfeed increases with increasing maternal age. This was more noticeable in the intervention group compared to the control group: *Table 41* and *Figure 6*.

When the intervention and the control groups were combined, the intention to breastfeed significantly increased with increasing maternal age ($\chi 2 = 9.535$, degrees of freedom (DF) = 3, $p<0.05$).

Table 42 - Breastfeeding at delivery and maternal age

	Intervention		Control	
Age (years)	**Total** (No.)	**Breast** No. (%)	**Total** (No.)	**Breast** No. (%)
1. **< 20**	93	15 (16.1)	96	12 (12.5)
2. **20-24**	141	23 (16.3)	151	30 (19.9)
3. **25-29**	125	33 (26.4)	140	28 (20.0)
4. **≥30**	86	31 (36.1)	90	24 (26.7)

Four intervention subjects did not record age (3 initiated breastfeeding, one did not)

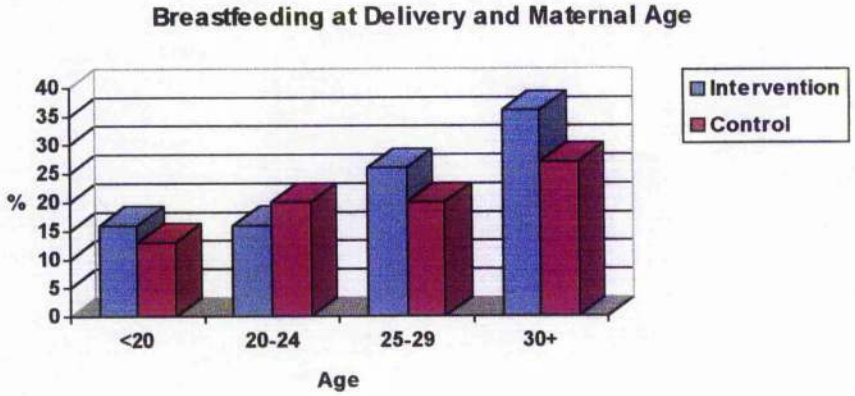


Figure 7: Breastfeeding at delivery and maternal age

There were no significant differences between the intervention and the control groups in *Table 42*. Older mothers appeared to be slightly more likely to initiate breastfeeding at delivery. The association appeared stronger in the intervention group; *Figure 7*.

When the intervention and the control groups were combined the initiation of breastfeeding significantly increased with increasing maternal age ($\chi 2 = 28.305$, DF = 3, $p<0.001$), *Table 42*.

Table 43 - Breastfeeding at discharge and maternal age

Intervention				
Age (years)	**Total** (No.)	**Breast** No. (%)	**Breast & Bottle** No. (%)	[1]**Any Breast** No. (%)
1. **<20**	93	6 (6.5)	2 (2.2)	8 (8.6)
2. **20-24**	141	11 (7.8)	4 (2.8)	15 (10.6)
3. **25-29**	125	25 (20.0)	4 (3.2)	29 (23.2)
4. **≥30**	86	22 (25.6)	6 (7.0)	28 (32.6)
Control				
1. **<20**	96	8 (8.3)	0	8 (8.3)
2. **20-24**	151	17 (11.3)	1 ((0.7)	18 (11.9)
3. **25-29**	140	22 (15.7)	0	22 (15.7)
4. **≥30**	90	18 (20.0)	3 (3.3)	21 (23.3)

[1]Any Breast = exclusive breastfeeding plus breastfeeding combined with bottle-feeding.

Two intervention subjects stated feeding at discharge as "other".

Four intervention subjects did not record age (2 breastfeeders and 2 bottle-feeders)

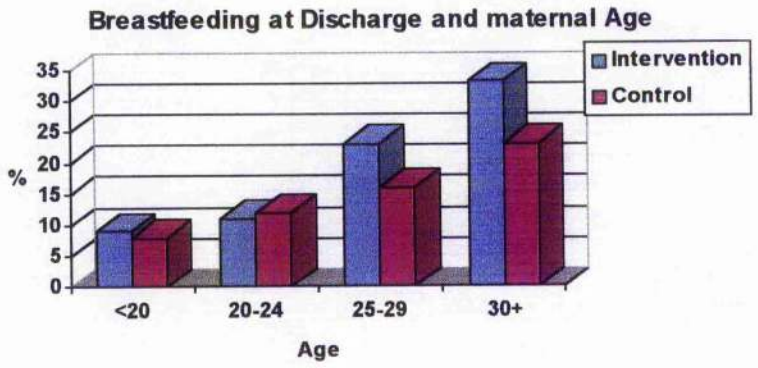


Figure 8: Breastfeeding at hospital discharge and maternal age

Figure 8 demonstrates the association between breastfeeding and maternal age. As age increased so did the likelihood of breastfeeding at hospital discharge. The association appeared stronger in the intervention group. However, there were no significant differences between the intervention and control groups in *Table 43*.

When the intervention and the control groups were combined the breastfeeding at discharge significantly increased with increasing maternal age ($\chi 2 = 9.535$, DF = 3, $p<0.05$), *Table 43*.

Table 44 - Breastfeeding at six weeks and maternal age

Intervention				
Age (years)	**Total** (No.)	**Breast** No. (%)	**Breast & Bottle** No. (%)	**Any Breast** No. (%)
1. **<20**	93	3 (3.2)	2 (2.2)	5 (5.4)
2. **20-24**	141	4 (2.8)	1 (0.7)	5 (3.6)
3. **25-29**	123	13 (10.6)	1 (0.8)	14 (11.4)
4. **≥30**	86	16 (18.6)	2 (2.3)	18 (20.9)
Control				
1. **<20**	94	2 (2.1)	0	2 (2.1)
2. **20-24**	149	3 (2.0)	4 (2.7)	7 (4.7)
3. **25-29**	139	10 (7.2)	3 (2.2)	13 (9.4)
4. **≥30**	90	10 (11.1)	4 (4.4)	14 (15.6)

Three intervention subjects stated feeding as "other" (one each from age categories 1,2 and 3)

Four intervention subjects did not record maternal age (1 breastfeeder and 3 bottle-feeders)

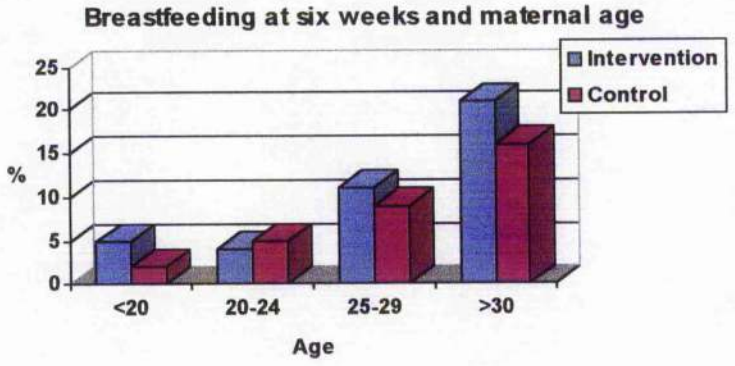


Figure 9: Breastfeeding at six weeks and maternal age

Figure 9 also demonstrates the increasing prevalence of breastfeeding with increasing maternal age. There were no significant differences between the control and the intervention groups. However, chi-squared analysis demonstrated a significant increase in breastfeeding at six weeks with increasing maternal age ($\chi 2 = 34.753$, DF = 3, $p<0.001$), *Table 44*.

6:4:7:3. Parity (primigravida compared to multigravida) and feeding

A number of studies, which attempted to promote breastfeeding, targeted primigravid women in the belief that their intention and behaviours would not be affected by previous experience. To allow comparison, the intentions and behaviour of primigravid and parous subjects are recorded in the *Table 45*, *Table 46*, and *Table 47*. For proportions of primigravid and multigravid subjects see *Table 18* and for the distribution of children see *Table 20* and *Figure 5*.

Table 45 - Antenatal intention of primigravid and parous subjects at booking (Questionnaire I) and return (Questionnaire II)

	Q: (No.)	Breast No. (%)	Bottle No. (%)	Undecided No.(%)	Unknown No.(%)
I: Prim	**QI:** (206)	42 (20.4)	108 (52.4)	54(26.2)	0
I: Parous	**QI:** (268)	44 (16.4)	170 (63.5)	54 (20.1)	0
C: Prim	**QI:** (211)	45 (21.3)	135 (64.0)	31 (14.7)	0
C: Parous	**QI:** (310)	66 (21.3)	218 (70.3)	26 (8.4)	0
I: Prim	**QII:** (202)	44 (21.8)	112 (55.4)	16 (7.9)	30 (10.6)
I: Parous	**QII:** (254)	50 (19.7)	164 (64.6)	13 (5.1)	27 (10.6)
C: Prim	**QII:** (198)	40 (20.2)	126 (63.6)	15 (7.6)	15 (7.6)
C: Parous	**QII:** (286)	51 (17.8)	179 (62.6)	16 (5.6)	39 (13.6)

Unknown = Questionnaire (Q) incomplete, I = intervention, C = control, Prim = primigravid.

Two intervention primigravida stated feeding intention at booking as "other".

Two control primigravida and one control parous stated feeding intention at return as "other".

Using chi-squared analysis, there were no statistically significant differences in intention to breastfeed when comparing parity within the intervention and control groups and between the intervention and control groups at either Questionnaire I or Questionnaire II.

At booking (Questionnaire I), more intervention primigravid subjects (20%) intended to breastfeed than intervention parous subjects (16%). In the control group the intention to breastfeed of primigravid and parous subjects and was the same (21% in each). Primigravid subjects (26% of the intervention and 15% of the control) were more likely to be undecided about infant feeding in early pregnancy than parous subjects (20% of the intervention and 8% of the control). At booking higher proportions of intervention primigravid (26%) and parous subjects (20%) were undecided compared to control primigravid (15%) and parous subjects (8%): *Table 45*.

At return (Questionnaire II), a greater proportion of both the intervention subsets (22% of intervention primigravida and 20% intervention parous) intended to breastfeed when compared to the control subsets (20% of control primigravida and 18% control parous subjects). Slightly more intervention primigravida (22%) intended to breastfeed than intervention parous subjects (20%).

The proportion undecided was the same for intervention and control group when controlling for parity. However, more primigravid subjects (8% in the intervention and the control group) were undecided when compared to parous subjects (5% in the intervention and the control group).

Table 46 - Feeding method at delivery of primigravid and parous subjects (Questionnaire III)

	Breastfed No. (%)	**Bottle-fed** No. (%)
I: Primigravida (N=198)	54 (27.3)	144 (72.7)
I: Parous (N=251)	51 (20.3)	200 (79.7)
C: Primigravida (N=196)	41 (20.9)	155 (79.1)
C: Parous (N=281)	53 (18.9)	228 (81.1)

There were no statistically significant differences in initiation of breastfeeding when controlling for parity or exposure to the intervention.

In both the intervention and the control groups more primigravid subjects initiated breastfeeding at delivery (27% and 21% respectively) compared to parous subjects (20% in the intervention group and 19% in the control group): *Table 46*.

Table 47 - Postnatal feeding method of primigravid and parous subjects (Questionnaires III and IV)

	No.	Breast No. (%)	Both No. (%)	Any breast[1] No. (%)	Bottle No.(%)
I: Prim	**Q III:** (198)	36 (18.2)	6 (3.0)	42 (21.2) +	155 (78.3)
I: Parous	**Q III:** (251)	30 (11.9)	10 (4.0)	40 (15.9)	210 (83.7)
C: Prim	**Q III:** (196)	26 (13.3)	1 (0.5)	27 (13.8) +	169 (86.2)
C: Parous	**Q III:** (281)	39 (13.9)	3 (1.1)	42 (14.9)	239(85.0)
I: Prim	**Q IV:** (197)	18 (9.1)	2 (1.0)	20 (10.1)	176 (89.3)
I: Parous	**Q IV:** (250)	19 (7.6)	4 (1.6)	23 (9.2)	225 (90.0)
C: Prim	**Q IV:** (193)	9 (4.7)	6 (3.1)	15 (7.8)	178 (92.2)
C: Parous	**Q IV:** (279)	16 (5.7)	5 (1.8)	21 (7.5)	258 (92.5)

[1]Any breast includes exclusive breastfeeding and breast combined with bottle-feeding

At discharge (QIII) one intervention primigravid and one intervention parous stated feeding as "Other"

At six weeks (QIV) one intervention primigravid and two intervention parous stated feeding as "Other"

+ RR=1.55, 95% CI (1.00,2.41), p=0.05 (NS).

Using chi-squared analysis, there were no statistically significant differences between the behaviour of parous and primigravid subjects at discharge. More intervention primigravida (21%) were still breastfeeding when compared to any other subset (16% intervention parous, 14% control primigravida and 15% of control parous). A nearly significantly greater proportion of intervention primigravida was breastfeeding at hospital discharge compared to control primigravida (p=0.05): *Table 47*.

Using chi-squared analysis, there were no statistically significant differences between the behaviour of parous and primigravid subjects at six weeks. Almost equal proportions of intervention parous (9%) and primigravid subjects (10%) were still breastfeeding. Smaller, but equal, proportions of control primigravid (8%) and parous subjects (7%) were still breastfeeding. Intervention primigravida (7%) practised exclusive breastfeeding more often than any other group but this was not statistically significant: *Table 47*.

A summary of parity and feeding intention and behaviour is presented in the summary section 6.7.8.

6:4:7:4. Admission to Special Care Nursery (SCN) and feeding

Significantly more intervention babies were admitted to SCN than control babies: *Table 21*. However, admission to SCN did not significantly affect initiation of breastfeeding: *Table 23*.

Table 48 - Admission to SCN and initiation of breastfeeding

	Attempted breastfeeding No. (%)	**No attempt to breastfeed** No. (%)
I: SCN (N=109)	27 (24.8)	82 (75.2)
I: no SCN (N=340)	78 (22.9)	262 (77.1)
C: SCN (N=69)	12 (17.4)	57 (82.6)
C: no SCN (N=408)	82 (20.1)	326 (79.9)

I = intervention, C = control

Slightly more intervention babies admitted to SCN (25%) were breastfed at delivery than intervention babies not admitted to SCN (23%). Conversely, fewer control babies admitted to SCN (17%) were breastfed at delivery than control babies not admitted to SCN (20%). These differences were not statistically significant: *Table 48*.

Table 49 - Admission to SCN and feeding at hospital discharge

	Breastfed No. (%)	**Both** No. (%)	**[1]Any breast** No. (%)	**Bottle** No. (%)
I: SCN (N=109)	17 (15.6)	4 (3.7)	21 (19.3)	86 (78.9)
I: no SCN (N=340)	49 (14.4)	12 (3.5)	61 (17.9)	279 (82.0)
C: SCN (N=69)	7 (10.1)	0	7 (10.1)	62 (89.9)
C: no SCN (N=408)	58 (14.2)	4 (1.0)	62 (15.2)	346 (84.8)

[1]Any breast includes exclusive breastfeeding and breast combined with bottle-feeding

Two intervention subjects admitted to SCN stated feeding at discharge as "other".

Using chi-squared analysis, there were no statistically significant differences in feeding at discharge when comparing admission to SCN.

More intervention babies admitted to SCN (16%) were exclusively breastfed at discharge compared to those not admitted to SCN (14%). In the control group, 10% of babies admitted to SCN were discharged breastfeeding exclusively compared to 14% not admitted to SCN. Intervention group mothers whose babies were admitted to SCN were more likely to continue to breastfeed than control group mothers whose babies were admitted to SCN: *Table 49*.

Table 50 - Admission to SCN and feeding at six weeks

	Breastfed No. (%)	**Both** No. (%)	**Any breast** No. (%)	**Bottle** No. (%)
I: SCN (N=109)	11 (10.1)	1 (0.9)	12 (11.0)	94 (86.2)
I: no SCN (N=338)	26 (7.7)	5 (1.5)	31 (9.2)	307 (90.8)
C: SCN (N=67)	1 (1.5)	2 (3.0)	3 (4.5)	64 (95.5)
C: no SCN (N=405)	24 (5.9)	9 (2.2)	33 (8.1)	372 (91.8)

Three intervention subjects admitted to SCN stated feeding method as "other"

There were no statistically significant differences between feeding at six weeks and admission to SCN. However, intervention babies admitted to SCN (11%) were more likely to be breastfeeding at six weeks than control babies admitted to SCN (3%), *Table 50*.

Table 51 - Admission to SCN and feeding intention at booking (8-12 weeks)

	Breast No. (%)	**Bottle** No. (%)	**Undecided** No. (%)	**Other** No. (%)
I: SCN (N=109)	24 (22.0)	63 (57.8)	22 (20.2)	0
I: no SCN (N=340)	58 (17.1)	199 (58.5)	81 (23.8)	2 (0.6)
C: SCN (N=69)	18 (26.1)	44 (63.8)	7 (10.1)	0
C: no SCN (N=408)	85 (20.8)	281 (68.9)	42 (10.3)	0

Total for each feeding method differ from booking totals (Table 21) due to attrition of sample.

There were no statistically significant differences between admission to SCN and feeding intention at booking. However, intention to breastfeed was higher in the groups whose babies were admitted to SCN: *Table 51*.

Table 52 - Admission to SCN and feeding intention at return (>28 weeks)

	Breast No. (%)	**Bottle** No. (%)	**Undecided** No. (%)	**Unknown** No. (%)
I: SCN (N=87)	19 (21.8)	61 (70.1)	7 (8.0)	22
I: no SCN (N=305)	73 (23.9)	210 (68.8)	22 (7.2)	35
C: SCN (N=62)	12 (19.3)	44 (71.0)	6 (9.7)	7
C: no SCN (N=361)	79 (21.9)	254 (70.4)	25 (6.9)	47

Three control subjects not admitted to SCN stated feeding intention as "other".

Total for each feeding method differ from Return totals (Table 25) due to attrition of sample.

Slightly more intervention subjects (22%) than control subjects (19%) whose babies were admitted to SCN stated an intention to breastfeed at return: *Table 52*.

A summary of the association between SCN and feeding intention and practice is given in the summary section 6.4.8.

6:4:7:5. Type of delivery and feeding

Table 53 - Type of delivery and feeding at delivery and hospital discharge

	Intervention			Control		
	Breast No. (%)	**Both** No. (%)	**Bottle** No. (%)	**Breast** No. (%)	**Both** No. (%)	**Bottle** No. (%)
QIII: Delivery						
SVD (I=314) (C=339)	70 (22.3)	0	244 (77.7)	64 (18.9)	0	275 (81.1)
FD/VE (I=46) (C=67)	12 (26.1)	0	34 (73.9)	15 (22.4)	0	52 (77.6)
CS (I=79) (C=64)	21 (26.6)	0	58 (73.4)	13 (20.3)	0	51 (79.7)
Other (I=10) (C=7)	2	0	8	2	0	5
QIII: Discharge			[1]**Any Breast**			[1]**Any Breast**
SVD (I=314) (C=339)	41 (13.1)	13 (4.1)	54 (17.2)	43 (12.7)	4 (1.2)	47 (13.9)
FD/VE (I=46) (C=67)	7 (15.2)	2 (4.3)	9 (19.6)	12 (17.9)	0	12 (17.9)
CS (I=79) (C=64)	16 (20.2)	1 (1.3)	17 (21.5)	8 (12.5)	0	8 (12.5)
Other (I=10) (C=7)	2	0	2	2	0	2

SVD = Spontaneous Vertex Delivery, FD/VE = Forceps Delivery or Ventouse Extraction, CS= Caesarean Section, Other = twins or blank.
[1]Any breast includes exclusive breastfeeding and breast combined with bottle-feeding.
One intervention SVD and one intervention twins stated feeding as "other" at discharge.

There were no statistically significant differences when comparing type of delivery with feeding method at delivery or discharge.

A greater proportion of the intervention group delivered by CS initiated breastfeeding (27%) and were exclusively breastfeeding at discharge (20%) compared to the intervention mothers who delivered by SVD (22% at delivery and 13% at discharge): *Table 53*.

In the control group almost equal proportions of mothers delivered by CS (20%) and delivered by SVD (19%) initiated breastfeeding. By discharge equal proportions of control mothers delivered by caesarean section (12.5%) or normally (13%) were exclusively breastfeeding: *Table 53*.

Table 54 - Feeding at six weeks and type of delivery

	Intervention			Control		
	Exclusive Breast No. (%)	**Breast & Bottle** No. (%)	**Any breast** No. (%)	**Exclusive Breast** No. (%)	**Breast & Bottle** No. (%)	**Any breast** No. (%)
QIV: Six Weeks						
SVD (I=313) (C=338)	21 (6.7)	6 (1.9)	27 (8.6)	18 (5.3)	7 (2.1)	25 (7.4)
FD/VE (I=45) (C=66)	3 (6.7)	0	3 (6.7)	5 (7.6)	3 (4.5)	8 (12.1)
CS (I=79) (C=61)	11 (13.9)	0	11 (13.9)	1 (1.6)	1 (1.6)	2 (3.3)
Other (I=7) (C=7)	2	0	2	1	0	1

One intervention SVD, one intervention FD/VE and one intervention twins stated feeding method as "other" at six weeks.

The highest incidence of breastfeeding at six weeks was found in the intervention group delivered by CS (14%). The lowest incidence was found in the control group delivered by CS (3%). Statistical analysis would be unreliable due to small sample size: *Table 54*.

It was possible that postnatal feeding reflected antenatal intention.

Table 55 - Antenatal feeding intention and type of delivery

	Intervention			Control		
	Breast No. (%)	**Bottle** No. (%)	**Unsure** No. (%)	**Breast** No. (%)	**Bottle** No. (%)	**Unsure** No. (%)
QI: Booking						
SVD (I=314) (C=339)	*49 (15.6)	188 (59.9)	75 (23.9)	*77 (22.7)	232 (68.4)	30(8.8)
FD/VE (I=46) (C=67)	9 (19.6)	29 (63.0)	8 (17.4)	12 (17.9)	43 (64.2)	12(17.9)
CS (I=79) (C=64)	22 (27.8)	39 (49.4)	18 (22.8)	12 (18.7)	45 (70.3)	7 (10.9)
Other (I=8) (C=7)	2	4	2	2	5	0
QII: Return						
SVD (I=314) (C=339)	62 (19.7)	196 (62.4)	56 (17.8)	69 (20.3)	211 (62.2)	59 (17.4)
FD/VE (I=46) (C=67)	9 (19.6)	30 (65.2)	7 (15.2)	10 (14.9)	42 (62.7)	12 (17.9)
CS (I=79) (C=64)	20 (25.3)	42 (53.2)	17 (21.5)	11 (17.2)	42 (65.6)	11 (17.2)
Other (I=10) (C=7)	1	3	6	1	3	3

At Questionnaire I, two intervention mothers who delivered by SVD stated intention as "other".

At Questionnaire II, three control mothers who delivered by FD/VE stated intention as "other".

For Questionnaire II, the column labelled unsure includes the category "unknown".

Total for each feeding method differ from Booking totals (Table 21) and Return totals (Table 22) due to attrition of sample.

***RR 0.69, 95% CI (0.5, 0.96), p<0.05.**

Intervention group subjects who intended to breastfeed were significantly less likely to deliver by SVD ($p<0.05$) than control group subjects.

A higher proportion of intervention mothers (28% at QI and 25% at Q II) who subsequently delivered by CS intended to breastfeed when compared to mothers who delivered normally (16% at QI and 20% at QII). In the control group, fewer mothers (19% at QI and 17% at Q II) who were subsequently delivered by CS intended to breastfeed compared to mothers who delivered normally (23% at QI and 20% at Q II): *Table 55*.

A summary of the association between feeding intention, feeding behaviour and type of delivery is given in the summary section, 6.4.8.

6:4:7:6. Attendance at antenatal classes and feeding method

Less than one third of each study group attended antenatal classes. However, slightly more control subjects (33%) attended classes than intervention subjects (28%): *Table 21.*

Table 56 - Attendance at antenatal classes and initiation of breastfeeding

	Attempted to breastfeed No. (%)	**No attempt to breastfeed** No. (%)
I: classes (N=127)	39 (30.7)	88 (69.3)
I: no classes (N=322)	66 (20.5)	256 (79.5)
C: classes (N=157)	42 (26.7)	115 (73.2)
C: no classes (N=320)	52 (16.2)	268 (83.7)

I = intervention, C = control

Classes compared with no classes: RR of breastfeeding = 1.55, 95%CI (1.21, 1.98), p<0.001.

Intervention: classes compared with no classes: RR of breastfeeding = 1.50, 95% CI (1.08, 2.10), p<0.05.

Control: classes compared with no classes: RR of breastfeeding = 1.65, 95% CI (1.15, 2.36), p<0.01.

In both groups attendance at classes was significantly associated with an increased initiation of breastfeeding. Class attendees whether in the control or the intervention group were 1.5 times more likely to initiate breastfeeding than non-attendees, p<0.001. In the intervention group, 31% of those who attended classes initiated breastfeeding compared to 21% of those who had not attended classes, p<0.05. In the control group, 27% off those attending classes initiated breastfeeding compared to 16% of those not attending classes, p<0.01: *Table 56.*

Table 57 - Attendance at antenatal classes and feeding intention at booking

	Intervention		**Control**	
Antenatal Intention	**Classes** No. (%)	**No classes** No. (%)	**Classes** No. (%)	**No classes** No. (%)
Breast (I=82) (C=103)	31 (37.8)	51 (62.2)	39 (37.9)	64 (62.1)
Bottle (I=262) (C=325)	59 (22.5)	203 (77.5)	96 (29.5)	229 (70.5)
Undecided (I=103) (C=49)	36 (34.9)	67 (65.1)	22 (44.9)	27 (55.1)

Two intervention subjects stated feeding intention as "Other", one attended classes and one did not.

***Classes compared to no classes: RR of breastfeeding = 1.38, 95% CI (1.06, 1.79), p<0.05**

Mothers intending to breastfeed (38% of both the intervention and the control group) were significantly more likely to attend classes than mothers intending to bottle-feed (23% of the intervention group and 30% of the control group), p<0.05. A higher, but not statistically significant, proportion of control group undecided subjects (45%) attended classes than intervention group undecided (35%): *Table 57.*

Table 58 - Attendance at antenatal classes and feeding intention at return

Antenatal Intention	Intervention		Control	
	Classes No. (%)	No classes No. (%)	Classes No. (%)	No classes No. (%)
Breast (I=92) (C=91)	30 (32.6)	62 (67.4)	39 (42.9)	52 (57.1)
Bottle (I=271) (C=298)	76 (28.0)	195 (65.4)	91 (30.5)	207 (69.5)
Undecided (I=29) (C=31)	6 (20.7)	23 (74.2)	11 (35.5)	20 (64.5)

Three Control subjects stated feeding intention as "Other", one attended classes and two did not.

Classes versus no classes: RR of breastfeeding = 1.34, 95%CI (1.03, 1.73), p<0.05.

Control: class versus no class: RR of breastfeeding = 1.48, 95% CI (1.03, 2.13), p<0.05.

Intervention: class vs. no class: RR of breastfeeding = 1.21, 95% CI (0.83, 1.76), p=0.3 (NS).

Feeding intention at return was still associated with class attendance although the association was less striking than when compared to booking intention. Mothers attending classes were significantly more likely to intend to breastfeed. Control group mothers attending classes were significantly more likely to intend to breastfeed at the return visit. However, in the intervention group, class attendance was not significantly associated with an intention to breastfeed at the return visit.

Table 59 - Attendance at antenatal classes and feeding at discharge

Postnatal Feeding	Intervention		Control	
	Classes No. (%)	No classes No. (%)	Classes No. (%)	No classes No. (%)
Breast (I=66) (C=65)	24 (36.4)	42 (63.6)	24 (36.9)	41 (63.1)
Both (I=16) (C=4)	4 (25.0)	12 (75.0)	2 (50.0)	2 (50.0)
Bottle (I=365) (C=408)	99 (27.1)	266 (72.9)	131 (32.1)	277 (67.9)

Two intervention non-class subjects stated feeding at discharge as "other"

There were no statistically significant differences between class attendees and non-attendees and breastfeeding at discharge. When analysed by exposure to the intervention, there were no statistically significant differences between class attendees and non-attendees in either the control or the intervention groups: *Table 59*.

Table 60 - Attendance at antenatal classes and feeding at six weeks

	Intervention		Control	
Postnatal Feeding	**Classes** No. (%)	**No classes** No. (%)	**Classes** No. (%)	**No classes** No. (%)
Breast (I=37) (C=25)	13 (35.1)	24 (64.9)	11 (44.0)	14 (56.0)
Both (I=6) (C=11)	3 (50.0)	3 (50.0)	3 (27.3)	8 (72.7)
Bottle (I=401) (C=436)	111 (27.7)	290 (72.3)	142 (32.6)	294 (67.4)

Three intervention non-class subjects stated feeding at discharge as "other"

There were no statistically significant differences in breastfeeding at six weeks between those who attended classes and those who did not: *Table 60.*

6:4:7:7. Antenatal and postnatal visits and feeding intention and method (intervention group)

Influence of antenatal visit

Table 61 - Antenatal visit and feeding intention (Questionnaire I)

	**Breastfeed No. (%)	Bottle-feed No. (%)	*Undecided No. (%)
Visited (N=332)	**68 (20.5)	179 (53.9)	*85 (25.6)
Not Visited (N=136)	**17 (12.5)	97 (71.3)	*22 (16.2)

Two visited subjects stated intention as "other"

** **RR1.85 (1.14, 2.99) p<0.01**

* **RR 1.58 (1.04, 2.42) p<0.05**

Study subjects stating an intention to breastfeed at booking were significantly more likely to receive an antenatal visit than subjects stating an intention to bottle-feed (p<0.01). Likewise, subjects who had not decided about infant feeding were significantly more likely to receive an antenatal visit than subjects who had decided to either breast or bottle-feed (p<0.05): *Table 61.*

Table 62 - Antenatal visit and feeding intention (Questionnaire II)

	**Breastfeed No. (%)	Bottle-feed No. (%)	Undecided/unknown No. (%)
Visited (N=328)	**79 (24.1)	185 (56.4)	64 (19.5)
Not Visited (N=126)	**15 (11.9)	89 (70.6)	22 (17.5)

** **RR 2.07 (1.25, 3.43) p<0.01**

Study subjects stating an intention to breastfeed at the return visit were significantly more likely to have received an antenatal visit than subjects stating an intention to bottle-feed (p<0.01). Study subjects who remained undecided at the return visit were no more likely to have been visited than study subjects who had had made a feeding decision, p=0.6: *Table 62.*

Table 63 - Antenatal visit and feeding method at delivery (Questionnaire III)

	*Breastfeed No. (%)	Bottle-feed No. (%)
Visited (N=326)	*86 (26.4)	240 (73.6)
Not Visited (N=122)	*19 (15.6)	103 (84.4)

* **RR 1.69 (1.08, 2.66) p<0.05**

Study subjects who had received an antenatal visit were significantly more likely to initiate breastfeeding at delivery ($p<0.05$); *Table 63*.

Table 64 - Antenatal visit and feeding method at discharge (Questionnaire III)

	Exclusively Breastfeeding No. (%)	**Breast and Bottle** No. (%)	**Any breast** No. (%)
Visited (N=326)	53 (16.3)	14 (4.3)	[a] 67 (20.6)
Not Visited (N=122)	13 (10.7)	2 (1.6)	[a] 15 (12.3)

Two study subjects stated feeding at discharge as "other" one had been visited and one had not.

[a] RR 1.67 (0.99, 2.81) p=0.06 (Yates corrected)

Study subjects who had received an antenatal visit were more likely to be breastfeeding at hospital discharge, however this was not statistically significantly: *Table 64*.

Table 65 - Antenatal visit and feeding method at six weeks (Questionnaire IV)

	Exclusively Breastfeeding No. (%)	**Breast and Bottle** No. (%)	**Any breast** No. (%)
Visited (N=324)	31 (9.6)	6 (1.9)	37 (11.4)
Not Visited (N=119)	6 (5.0)	0	6 (5.0)

Three subjects stated feeding as "other", one was visited and two were not

Study subjects who had received an antenatal visit were more likely to be breastfeeding at six weeks, however this was not statistically significant: (p=0.07, Yates Corrected).

Higher breastfeeding rates among intervention subjects who received antenatal visits probably reflect the higher breastfeeding intention among visited subjects.

Influence of postnatal visits on breastfeeding at six weeks.

Postnatal visits may influence feeding duration among the mothers who were breastfeeding at hospital discharge.

Table 66 - Postnatal visit and feeding method at six weeks (Questionnaire IV)

Feeding at hospital discharge	**Breastfeeding** No. (%)	**Breast and bottle** No. (%)	**Any breastfeeding** No. (%)	**Bottle-feeding** No. (%)
Visited Group				
Breastfeeding (N=55)	31 (56.4)	3 (5.5)	34 (61.8)	21 (38.2)
Breast and bottle-feeding (N=11)	1 (9.1)	2	3 (27.3)	8 (72.7)
Not visited Group				
Breastfeeding (N=11)	3 (27.3)	1 (9.1)	4 (36.4)	5 (45.5)
Breast and bottle-feeding (N=5)	2 (40.0)	0	2 (40.0)	3 (60.0)

Two breastfeeders from the not visited group were lost at six weeks

The numbers in *Table 66* are too small to enable any meaningful comparison.

6:4:8. Summary of quantitative results

6:4:8:1. Summary of breastfeeding intention and behaviour (Questionnaires I-IV)

A summary of breastfeeding intention and behaviour throughout pregnancy and up to six weeks postnatally is given in *Table 67* and *Table 68*.

Table 67 - Summary of proportions planning to provide or providing any breastmilk

	Q I Intending to BF (booking)	**Q II Intending to BF** (return)	**Q III Initiated BF** (delivery)	**Q III Any BF** (discharge)	**Q IV Any BF** (6 weeks)
Intervention Number (%)	86/474 (18.1)	94/399 (23.6)	105/449 (23.4)	82/449 (18.3)	43/447 (9.6)
Control Number (%)	111/521 (21.3)	91/430 (21.2)	94/477 (19.7)	69/477 (14.5)	36/472 (7.6)
Prevalence ratio					
Point estimate	0.85	1.11	1.19	1.26	1.26
95% CI	(0.66,1.10)	0.86,1.44)	(0.93, 1.52)	(0.94, 1.69)	(0.83, 1.93)
p-value	0.21	0.41	0.17	0.12	0.28

Table 68 - Summary of proportions providing only breastmilk

	Q III Exclusive BF (discharge)	**Q IV Exclusive BF** (6 weeks)
Intervention Number (%)	66/449 (14.7)	37/447 (8.3)
Control Number (%)	65/477 (13.6)	25/472(5.3)
Prevalence ratio		
Point estimate	1.08	1.56
Confidence interval	(0.79, 1.48)	(0.96, 2.55)
p-value	0.64	0.07

BF = breastfeeding

The prevalence ratios in *Table 67* and *Table 68* indicate that there were no statistically significant differences between either the intervention or the control group at any data collection point. However, there was a consistent pattern of increasingly higher proportions planning to provide or providing breastmilk in the intervention group as indicated by an increasing prevalence ratio.

6:4:8:2. Summary of the sequential changes from Questionnaire I (booking) to Questionnaire IV (six weeks)

Table 69 summarises changes in breastfeeding intention or practice during the study. In this analysis, study subjects were allocated to either "breast" or "non-breast" categories. During the antenatal period, "breast" was those intending to breastfeed and "non-breast" included bottle-feeders and those who were unsure. Postpartum, "breast" was those mothers who were exclusively breastfeeding or combining breast with bottle-feeding, while "non-breast" was those mothers who were only bottle-feeding.

Table 69 - Net gain in the intention to breastfeed or breastfeeding between sequential questionnaires (QI-QIV).

	*Booking to return	Return to delivery	Delivery to discharge	Discharge to 6 weeks
Intervention	15.8%	-0.8%	-5.1%	-8.3%
Control	+0.7%	-1.9%	-5.2%	-5.9%
Point Estimate	+5.1%	+0.9%	+0.1%	-2.3%
95% CI	(0.8, 9.4)%	(-3.0, 4.8)%	(-2.8, 3.0)%	(-5.7, 1.0)%
p-value	*0.02	0.66	0.95	0.17

Significantly more intervention mothers stated a change in their feeding intention in favour of breastfeeding between booking and return ($p<0.05$).

At delivery fewer mothers initiated breastfeeding than had intended to at return. This loss was less in the intervention than the control group but was not statistically significant. Over 5% of subjects who initiated breastfeeding stopped while in hospital. Between 6-8% of subjects who were breastfeeding at time of discharge had stopped by six weeks. This loss was larger in the intervention than the control group but was not statistically significant: *Table 69*.

6:4:8:3. Summary of antenatal intention to breastfeed

The small group of mothers (86 of the intervention and 111 of the control group, see *Table 24*) who stated an intention to breastfeed at booking (Questionnaire I) were followed-up through pregnancy to six weeks. *Table 70* records the proportions of this group who maintained their intention towards the end of pregnancy and who then went on to breastfeed at delivery, discharge and six weeks.

Table 70 - Follow-up of mothers stating an intention to breastfeed at booking

	Maintained intention at return No. (%)	****Initiated BF** No. (%)	**BF at discharge** No. (%)		**BF at 6 weeks** No. (%)	
			****Any BF**	**Exc. BF**	***Any BF**	*****Exc. BF**
Intervention (N=86, (100%))	62/71 (87.3)	67/82 (81.7)	56/82 (68.3)	46/82 (56.1)	32/80 (41.2)	26/80 (32.5)
Control (N=111, (100%))	68/88 (77.3)	66/103 (64.1)	50/103 (48.5)	47/103 (45.6)	26/100 (26.0)	9/100 (9.0)
RR	1.13	1.28	1.41	1.23	1.54	3.61
95% CI	(0.98, 1,30)	(1.07, 1.52)	(1.10, 1.80	(0.92, 1.63)	(1.00, 2.36)	(1.80, 7.26)
p value	0.1	0.008	0.007	0.2	0.05	0.00008

BF = breastfeeding which is both exclusive breastfeeding and breastfeeding combined with bottle-feeding, Exc. BF = exclusive breastfeeding. Sample size for each data point varies due to attrition of sample and to a number of recruits not completing Questionnaire II.

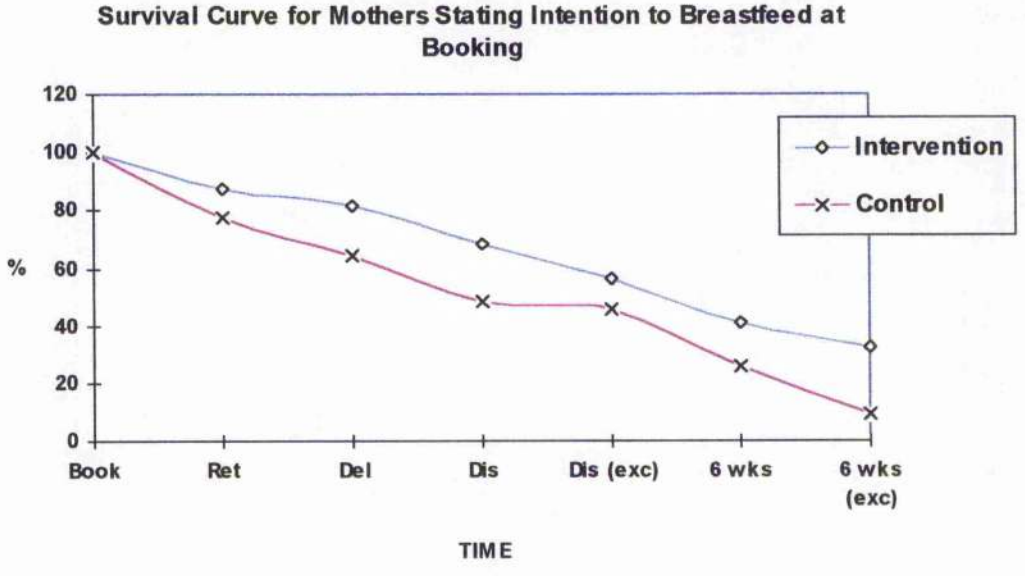


Figure 10: Survival curve for mothers intending to breastfeed at booking

(Book = booking (QI) Ret = return (QII); del = delivery (QIII); dis = any breastfeeding at discharge (QIII); dis (exc) = exclusive breastfeeding at discharge (QIII); 6 wks = any breastfeeding at 6 weeks (QIV); 6 wks (exc) = exclusive breastfeeding at 6 weeks (QIV).

The results show that the intervention group mothers who intended to breastfeed at booking were significantly more likely to initiate breastfeeding ($p<0.01$), to be breastfeeding at hospital discharge ($p<0.01$), to be breastfeeding at six weeks ($p<0.05$), and to be exclusively breastfeeding at six weeks ($p<0.001$), when compared to control group mothers who stated an intention to breastfeed at booking: *Table 70.*

Table 71 - Follow-up of mothers stating an intention to breastfeed at return

	Initiated BF No. (%)	**BF at discharge** No. (%)		**BF at 6 weeks** No. (%)	
		Any BF	**Exc. BF**	**Any BF**	**Exc. BF**
Intervention (N=94, (100%))	75/92 (81.5)	63/92 (68.5)	51/92 (55.4)	31/90 (34.4)	26/90 (28.9)
Control (N=91, (100%))	69/91 (75.8)	50/91 (54.9)	47/91 (51.6)	27/87 (31.0)	18/87 (20.7)
RR	1.08	1.25	1.07	1.11	1.4
95% CI	0.92, 1.25	0.99, 1.57	0.82, 1.41	0.73,1.70	0.83,2.36
p value	0.4	0.06	0.61	0.6	0.2

BF = breastfeeding which is both exclusive breastfeeding and breastfeeding combined with bottle-feeding. Exc. BF = exclusive breastfeeding. Sample size for each data point varies due to attrition of sample.

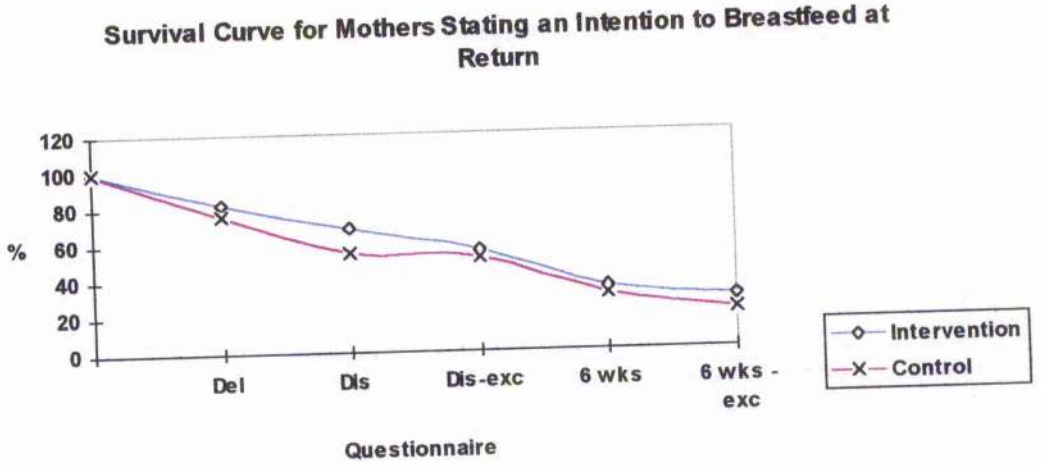


Figure 11: Survival curve for mothers intending to breastfeed at return

There were no significant differences between intention to breastfeed at return and subsequent feeding behaviour. However, in the intervention group there was a consistently higher incidence of breastfeeding and exclusive breastfeeding at all points of data collection: *Table 71.*

6:4:8:4. Summary of breastfeeding intention and behaviour and parity

Table 72 - Summary of breastfeeding intention/behaviour (Questionnaires I-IV) by parity (%)

	QI (%)	QII (%)	QIII-delivery (%)	QIII-discharge (%)	QIV (%)
I. Prim	20.4	21.8	27.3	21.2	10.1
I. Parous	16.4	19.7	20.3	15.9	9.2
C. Prim	21.3	20.2	20.9	13.8	7.8
C. Parous	21.3	17.8	18.9	14.9	7.5

I = intervention, C= Control

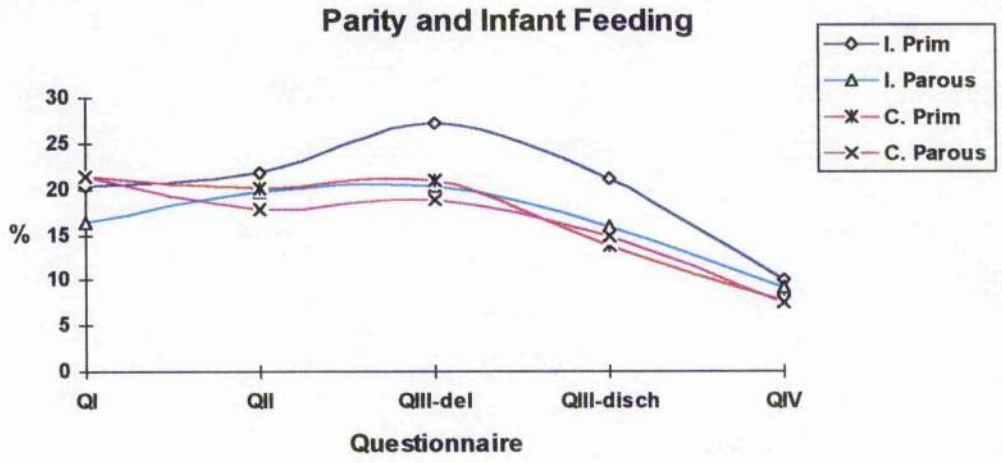


Figure 12: Breastfeeding and parity

The intervention primigravid group appears to be most successful in initiating breastfeeding and in breastfeeding at hospital discharge. However, by six weeks the prevalence of breastfeeding is almost equal in all subgroups: *Figure 12*.

6:4:8:5. Summary of breastfeeding intention and behaviour and SCN

Table 73 - Summary of intention to breastfeed/breastfeeding and admission to SCN (booking to six weeks), Questionnaires I-IV (%)

	QI (%)	QII (%)	QIII-Delivery (%)	QIII-Discharge (%)	QIV (%)
Intervention/ SCN	22.0	21.8	24.8	19.3	11.0
Intervention/ no SCN	17.1	23.9	22.9	17.9	4.5
Control / SCN	26.1	19.3	17.4	10.1	9.2
Control / no SCN	20.8	21.9	20.1	15.2	8.1

Q = Questionnaire

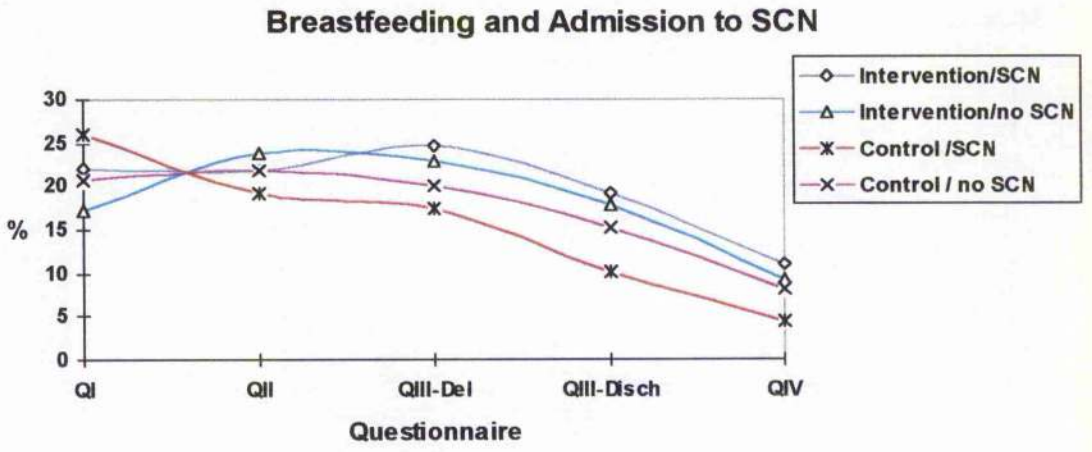


Figure 13: Breastfeeding and admission to SCN

It appears that the most successful group by proportion was the intervention group admitted to SCN, despite a higher antenatal intention to breastfeed among the control group admitted to SCN: *Figure 13*. However, there were no statistically significant differences between any of these sub-groups.

6:4:8:6. Summary of breastfeeding intention and behaviour and delivery

Table 74 - Summary of breastfeeding intention/behaviour and type of delivery (%)

	QI (%)	QII (%)	QIII-delivery (%)	QIII-discharge (%)	QIV (%)
Intervention SVD	15.6	19.7	22.3	17.1	8.6
Intervention FD/VE	19.6	19.6	26.1	19.6	6.7
Intervention CS	27.8	25.3	26.6	21.5	13.9
Control SVD	22.7	20.3	18.9	13.9	7.4
Control FD/VE	17.9	14.9	22.4	17.9	12.1
Control CS	18.7	17.2	20.3	12.5	3.3

Q = Questionnaire, SVD = spontaneous vertex delivery, FD = forceps delivery, VE = Ventouse extraction, CS = caesarean section.

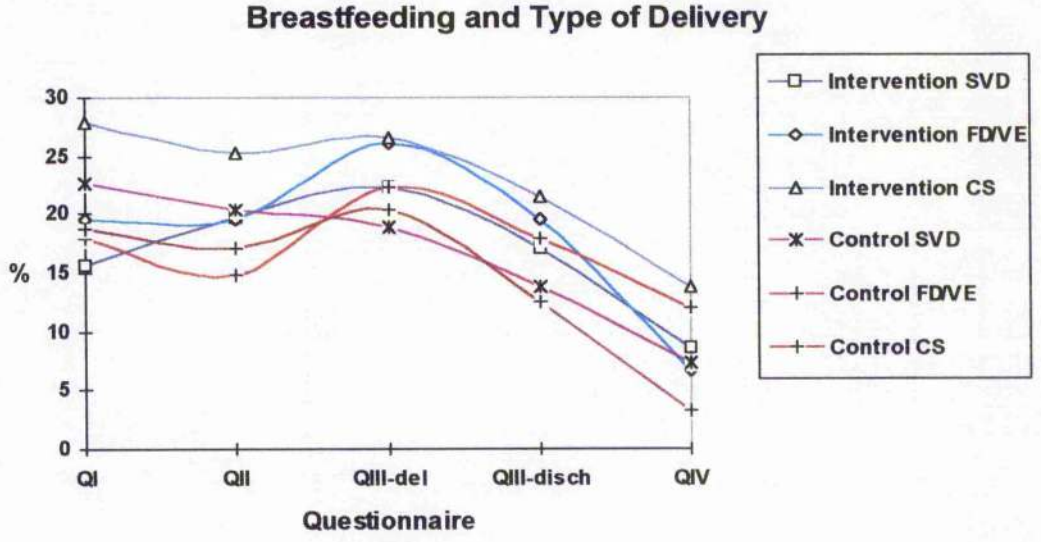


Figure 14: Breastfeeding and type of delivery

The highest prevalence of breastfeeding was found in the intervention group delivered by caesarean section: *Figure 14*.

6:4:8:7. Summary of breastfeeding intention and behaviour and class attendance

Table 75 - Summary of class attendance and breastfeeding (%)

	QI (%)	QII (%)	QIII-delivery (%)	QIII-discharge (%)	QIV (%)
Intervention / class	24.6	26.8	30.7	22.0	10.2
Intervention / no class	16.4	22.1	20.5	13.1	7.6
Control / class	24.8	27.7	26.7	16.6	7.1
Control / no class	20.0	18.6	16.2	13.4	4.4

Q = Questionnaire

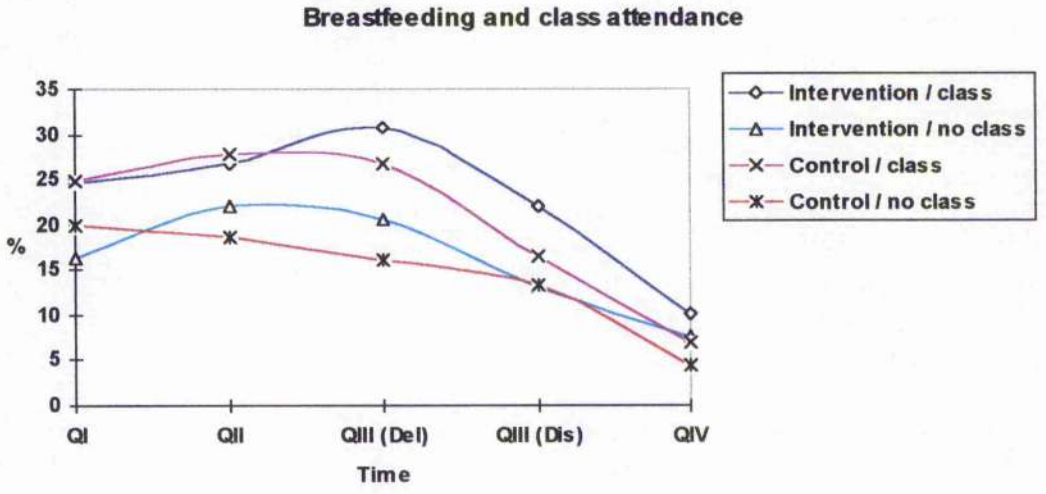


Figure 15: Breastfeeding and class attendance

Class attendance appears to be associated with higher proportions intending to breastfeed and breastfeeding.

6:4:9. Multivariate Analysis

Multivariate analyses were performed using logistic regression methods. These were carried out in order to assess whether any apparent differences (or similarity) between the control and intervention group with respect to a) breastfeeding initiation and b) breastfeeding at six weeks could be attributable to other underlying factors, which might have differed in the two areas and which were likely to affect breastfeeding.

The analysis assessed the statistical significance of the difference between the two areas with respect to feeding while adjusting for the following factors: deprivation category; caesarean section; baby to SCN; previous breastfeeding experience; attended breastfeeding workshops; attended antenatal classes; received milk tokens; smoker; breastfeeding intention at booking visit; living with partner; gestation at booking; prematurity; low birthweight; primigravid; age at booking. The selected factors had been previously shown, either in this or other studies, to have been associated, on univariate analysis, with feeding outcome.

6:4:9:1 Breastfeeding initiation

Intervention group versus control group: Odds Ratio (OR): **1.95**

95% confidence interval for the OR: **(1.22, 3.41)**

p-value: **0.006**

The odds ratio (OR) is a measure of the likelihood of someone in the intervention group initiating breastfeeding compared to the control group. The likelihood of someone in the intervention group initiating breastfeeding was likely to be between 1.22 and 3.14 times greater than the control group. Since the interval does not contain one and the p value is less than 0.01, there was a highly significant difference between the control and the intervention groups with respect to breastfeeding initiation once the various other factors had been taken into account.

6:4:9:2 Breastfeeding at six weeks

Intervention group versus control group: Odds Ratio (OR): **1.80**

95% confidence interval for the OR: **(0.96, 3.41)**

p-value: **0.07**

The likelihood of breastfeeding at six weeks in the intervention group was very likely to be between 0.96 and 3.14 times greater than the control group. Since the interval contains one and the p value is greater than 0.05, there was no significant difference between the control and the intervention groups with respect to breastfeeding initiation once the various other factors had been taken into account.

These results are consistent with the univariate and stratified analyses performed earlier.

6:4:10. Key quantitative results

- There was a statistically significant increase in the proportion intending to breastfeed between booking and return in the intervention group.
- Intervention mothers expressing an intention to breastfeed at booking were significantly more likely to initiate breastfeeding at delivery, to be breastfeeding at discharge and to be breastfeeding or exclusively breastfeeding at six weeks.
- There were no significant differences in the proportions of the intervention and control groups intending to breastfeed or breastfeeding at each point of data collection.
- After adjusting for possible confounding variables, intervention group subjects were statistically significantly more likely to initiate breastfeeding at delivery.

Subgroup analysis:

- A significantly greater proportion of the intervention group subjects initiated breastfeeding, were breastfeeding at hospital discharge and were exclusively breastfeeding at six weeks when compared to control subjects from a similarly disadvantaged background.
- Breastfeeding was more prevalent in vulnerable sub-groups (e.g. CS, admitted to SCN, primigravid) in the intervention population when compared to the control population.

6:5. Qualitative results

Study subjects were given the opportunity to record comments on each of the questionnaires. Although very few participants made any comments, more intervention than control subjects did so. Comments often reflected the personal impact the intervention had on the mother and her breastfeeding experience.

One of the more powerful comments was from a mother who obviously had no intention of breastfeeding: *"I thought that breastfeeding was disgusting and couldn't believe that any one could do it, but after speaking to the girls I decided to try it."* After speaking to the Helpers, this mother successfully breastfed her baby for 17 months, an experience which she described as enjoyable.

Mothers appeared to find the Helpers well informed, as demonstrated by a remark made by one woman visited in the antenatal period, *"You certainly know your stuff."*

During the postnatal period, mothers appeared pleased with the breastfeeding support offered as illustrated by the following: *"Support was brilliant!"* and *"Telephone contact with the Helper was beneficial - appreciated the support and availability."*

It also seemed that some mothers would have stopped breastfeeding prematurely if it had not been for the encouragement offered by their Helper: *"If she (the Helper) wasn't there for me at times when I thought of giving up breastfeeding because I was tired and thought I never had enough milk, I would have stopped."*

Another mother who might have stopped feeding prematurely said "*The information given was helpful and the thought of having support made me more determined to keep trying."*

One mother remarked *"I feel the Helpers gave me the reassurance I needed when things were stressful. I found their encouragement and understanding a great help."* This comment appears to indicate that this mother benefited from the support offered by the intervention.

Another mother remarked *"The help the girls gave me encouraged me greatly to breastfeed my baby. I'm so grateful."*

In addition to the physical health gains, which can be expected from breastfeeding, there are often psychological advantages for a mother who succeeds in breastfeeding. In an area such as Easterhouse, it may the first time this person has succeeded at anything. One woman, who contrary to expectation breastfed successfully, appeared to be a different person, more confident and self-assured, her comment was: *"It's good to be good at something."* Conversely, a mother from the control group who intended to breastfeed for a year and stopped breastfeeding after one week wrote, *"I feel a failure."*

A mother who was breastfeeding in very difficult circumstances stated a desire to do the best for her baby, *"I'll breastfeed for as long as possible because I enjoy doing it and because it is the best I can give my daughter."*

Much of the effort put into supporting mothers involved building confidence and encouraging a mother's belief in herself. A comment which reflects this is: *"I enjoyed talking with the Helpers as I was not very confident at first, now my confidence is growing."* This mother initially recorded her intention as "unsure" but went on and breastfed successfully.

One mother said, "*I would have liked to have seen a helper while in hospital*".

Comments also indicated that the Helper's approach might not benefit all mothers. One mother said "*They spoke too much, it was too much information.*"

These observations indicate the effect the Helpers had on individuals and the community in which they were working, while they were real effects, they were difficult to measure.

6:6. Other Results

6:6:1. Development of the Easterhouse Breastfeeding Promotion Group

This group formed from the training workshops run by the Infant Feeding Research Project during September-November 1994. Originally seven women attended the workshops, however only six stayed together to carry out the research project intervention and to develop the group further. The women were initially all strangers to each other but soon

became good friends and were able to give each other support and help with the task of promoting breastfeeding in an area where very few women would even consider it.

The group then secured the lease of accommodation in Easterhouse. Grants were obtained from the Greater Easterhouse Community Health Initiative to furnish the room and to purchase other essential items. This accommodation was used to co-ordinate the main work of the group and to run drop-in and information sessions for anyone interested. It also established the group's identity. The group designed their own logo for use in leaflets, letters, posters and sweatshirts and other promotional activities.

To publicise the venture and promote breastfeeding, an information stall was held during Breastfeeding Awareness Week (May, 1995) in Easterhouse shopping centre for one day, at the antenatal clinics at Easterhouse Health Centre for three days and at GRMH for four mornings.

An open day in September 1995 created publicity for the group in Easterhouse and beyond, marked the end of the first year and officially opened the breastfeeding support room. This was very well-attended by health professionals and mothers.

By September 1995, the number of Helpers in the group had fallen to five as one member left due to social and family commitments.

After the intervention had been running for about a year, members of the group were invited to attend seminars and workshops in various areas of Scotland to discuss their work. By the end of the second year, other health initiatives were interested in replicating the intervention. The Helpers were invited to provide information to projects in Ayr and Stirling with a view to building on their experiences in designing breastfeeding promotion projects.

In early 1997, the Easterhouse Breastfeeding Project expanded once again and recruited seven new members to participate in training with a view to becoming breastfeeding Helpers. Five members attended the training and after it was complete two joined the group to assist with promoting and supporting breastfeeding. Both new members had previously been supported by the Easterhouse Breastfeeding Helpers as they breastfed their babies.

Finally, the Easterhouse Breastfeeding Promotion Group's web site went live in October 1997 and can be viewed at www.millenn.com/breastfeed.

6:6:2. Bloomsbury Workshops

This is a series of workshops devised by Lea Jamieson, to improve the breastfeeding skills and knowledge of midwives and women. The workshops require pregnant women and midwives to work together.

Talking to strangers, or groups of strangers, was initially a daunting thought. Therefore to improve communication skills in a supportive environment the Helpers attended the Bloomsbury breastfeeding workshops at GRMH. Much was gained from this experience and the workshop facilitators remarked on the group's progress.

Feedback from women attending the workshops suggested that they had found the input from the Helpers very useful and well-informed. In view of this, the Helpers continued to be involved at these workshops up until late 1997.

From October 1997 onwards, the format of the Bloomsbury workshops changed and only one Helper was able to attend each workshop.

6:6:3. Initiation of peer breastfeeding support in GRMH

In the early days of the intervention, the Helpers reported that some of the study group had changed their intention from intending to bottle-feed to intending to breastfeed. However, at delivery the majority of these mothers in fact bottle-fed. The mother might have wanted to breastfeed and had not received sufficient support or encouragement in the hospital or she may have wished to please the Helper by agreeing with her enthusiasm for breastfeeding (Halo Effect). From anecdotal feedback it appeared likely that a combination of these possibilities were responsible.

Mothers commented on a lack of support within the maternity hospital, which often seemed to be associated with a lack of staff and/or space. One woman had waited for "*hours*" in the hospital for a midwife to help her fix her baby at the breast, no-one had come to help and she had ended up bottle-feeding. Another had been too shy to ask for advice. After having her baby one mother complained of being put in a "*waiting area*" with other mothers and their partners, when the auxiliary brought round bottles of milk, this mother took the milk and bottle-fed her baby as she was "*too embarrassed*" to say that she wanted to breastfeed and would need some help. Some of the lack of support appeared to be associated with

either a lack of knowledge or willingness on behalf of the staff. One mother had been given incorrect advice while another had been told to bottle-feed: "*When I told the nurse I wanted to breastfeed she gave me some bottles and told me to give myself a rest and someone would show me how to breastfeed the next day*". Another mother said "*My baby wouldn't take the breast so I was told to give him a bottle*".

It appeared that the ones who were successful with breastfeeding were strong willed and often were feeding a second or third baby. Least successful were those who were initially unsure about feeding intention or who were young or feeding their first baby.

Breastfeeding Awareness Week increased the Helpers awareness of the problems encountered by many non-intervention mothers trying to breastfeed. It also highlighted the reality of the hospital experience for some mothers and the sense that promotional efforts in the community were being undermined by lack of support in the hospital. After further discussions with obstetric, midwifery and project staff it was proposed that the Helpers should attend the hospital one morning per week in order to support the women recruited onto the project and to offer advice, information and support to anyone interested be it mother, midwife or doctor.

These sessions, which began on the 9th of November 1995, were very well attended from the outset. Antenatal women appeared pleased to speak to a knowledgeable person about breastfeeding, while postnatal mothers were offered support and encouragement or specific advice if they were having difficulties. As the Helpers became more accepted, they gained access to the Special Care Nurseries to assist mothers of sick or premature new-borns. Mothers of these babies would often be waiting on their arrival.

Input in GRMH culminated with one of the Helpers being invited to participate in the GRMH Breastfeeding Strategy Group, which was initiating the Baby Friendly Hospital Initiative in the hospital.

6:6:4. Initiation of peer breastfeeding support in Easterhouse Health Centre

After the birth of the first babies and the successful but unexpected breastfeeding by a number of intervention mothers, the consultant obstetrician from GRMH, who has a special

remit for Easterhouse, invited the breastfeeding Helpers to attend his outreach antenatal clinics to promote breastfeeding. Individual antenatal women were referred to the Helpers for information and encouragement.

6:6:5. Health care professionals

There was widespread interest from breastfeeding supporters in other areas of Scotland. By request, the Helpers have spoken at various conferences, workshops and courses. An Open Day was held in Easterhouse at the end of the first year of the intervention. This was apparently a great success and was very well attended by midwives, health visitors, breastfeeding mothers, obstetricians, paediatricians, staff from Health Promotion, the Healthy Cities Project and various others who had been involved with the intervention.

Finally, there have been requests from other areas to attempt to replicate this approach. Many of those involved in breastfeeding promotion had found other approaches to be unsuccessful and were convinced that this was likely to be the most appropriate method of promoting and supporting breastfeeding. Initiatives modelled on the Easterhouse Breastfeeding Promotion Project have been implemented in Ayr, Stirling and other areas of Glasgow.

6.7 Summary of the results

- It proved feasible to recruit and train lay breastfeeding counsellors.
- The intervention appeared acceptable to the community and to health professionals.
- The majority of study subjects received at least one antenatal visit and the majority of breastfeeding mothers received at least one postnatal visit.
- When data were analysed sequentially, there was a significant increase in maternal intention to breastfeed in the intervention group during pregnancy.
- When the intervention and the control groups were adjusted for deprivation status a statistically significantly higher proportion of intervention group mothers was breastfeeding at delivery and discharge and was exclusively breastfeeding at six weeks.
- Multivariate analyses demonstrated that a statistically significantly greater proportion of the intervention group initiated of breastfeeding at delivery but showed no difference at six weeks.
- A significantly higher proportion of intervention subjects who intended to breastfeed was breastfeeding at delivery, discharge and six weeks.
- Prevalence ratios demonstrated a trend in favour of breastfeeding in the intervention group. However, this was not statistically significant.
- There were no significant differences in the cross sectional comparisons of feeding between the intervention and the control groups at any point in data collection.
- The prevalence of breastfeeding in vulnerable sub-groups, such as mothers delivered by CS, mothers whose babies were admitted to SCN and primigravida, was higher in the intervention group than in the control group.

Chapter 7:

Discussion

Chapter 7: Discussion

There is growing recognition that breastfeeding confers a number of important health advantages on the baby and the mother. However, in some parts of Britain few mothers choose to breastfeed and those who do often breastfeed for a very short period of time. In particular the prevalence of breastfeeding is very low in areas of high socio-economic deprivation. There are a number of programmes that aim to increase breastfeeding but there is little evidence of the outcome of these interventions. The use of randomised controlled trials has not been widely reported and indeed may not be entirely appropriate for community-based interventions (Waterston, 1997). Since breastfeeding has been identified as a key area of paediatrics (Waterston, 1997), the evaluation of breastfeeding promotion initiatives is fundamental to increasing the prevalence of breastfeeding and so to improving paediatric health. Such initiatives may provide support for breastfeeding mothers, encourage mothers to choose to breastfeed, encourage society to accept breastfeeding as the cultural norm or put in place facilities or legislation that promote, support and protect breastfeeding.

The Glasgow Infant Feeding Action Research Project was implemented to evaluate a community-based initiative that aimed to increase the prevalence of breastfeeding in an area of socio-economic deprivation. This was the first study of community-based peer support in Britain to compare the impact of an intervention with a control group over a defined period of time. The intervention deployed local peer counsellors who provided antenatal education combined with postnatal support. It was hypothesised that the provision of antenatal education would increase breastfeeding intention while postnatal support would increase breastfeeding duration. Supportive evidence comes from a study of interventions designed to reduce inequalities in health, which demonstrated that most health promotion programmes had a health education component but that providing information was only successful if combined with personal support or structural measures (Gepkens and Gunning-Schepers, 1996).

Data collected from the intervention and the control group measured breastfeeding intention and behaviour as well as a number of demographic variables.

7:1. Study design

This was a unique study that documented the development and progress of a peer counselling and support group from its inception. To assess the impact of this group a cohort of women was followed from early pregnancy until six weeks following delivery. The intervention comprised a series of predetermined events, specified by a protocol, that took place during the antenatal and postnatal periods. The response of the study subjects to these events was documented throughout the intervention period. Many previously reported studies focused on the perinatal period or selected either the antenatal or postnatal period for the timing of the intervention.

Rather than employing a randomised-controlled trial, two distinct geographical areas of Glasgow were selected for comparison. No attempts were made to match subjects from the intervention area with subjects from the control area. However, data collected and analysed during the study demonstrated that the two communities were very similar and that any differences did not appear to significantly affect breastfeeding behaviour. The few differences that did exist tended to support an increased likelihood of breastfeeding in the control area. Therefore any increase in breastfeeding intention and behaviour in the intervention area was not confounded by the socio-demographic variables recorded. Certain postnatal variables such as separation of the mother and baby (Mobbs, 1973; Buxton *et al.*, 1991) and supplementation by formula in the postnatal period (Feinstein *et al.*, 1986; Michaelsen *et al.*, 1994; Blomquist *et al.*, 1994) are known to reduce the likelihood of successful breastfeeding. However, the effect of other variables such as type of delivery (Bruce, 1991; Foster *et al.*, 1997), birthweight (Elton, 1993) and prematurity remains inconclusive. The data collected demonstrated that the two groups did not differ significantly in any of the postnatal variables other than admission to SCN. This will be discussed later (see section 7.5.3).

It was possible that changes within either community during the study period may have affected feeding behaviour or intention. To evaluate possible changes over time, data from the first half of the study were compared with data from the second half of the study. Key demographic factors (i.e. smoking, parity, living with partner, milk tokens, previous breastfeeding experience and feeding intention) were taken as indicators for change. For

each half of the study, the two communities were comparable with each other. When comparing the data collected within each community there was a statistically significant reduction in milk tokens between the first half of the study and the second half in both communities. The change within each community was identical and is likely to reflect changes in the welfare state. From these findings it can be concluded that there were no significant changes in the composition of either community which may have affected the results.

It was hypothesised that this intervention would have a community effect whereby information from the Helpers would affect the attitude and knowledge of the community as a whole. If this were the case it would have been very difficult to avoid contamination of the control subjects by the intervention subjects if the two groups had been selected from the same location. In other studies, where mothers were randomised to either participate in an intervention or act as a control, contamination of the controls was observed (Grossman *et al.*, 1990; Oakley *et al.*, 1990; Schy *et al.*, 1996). To avoid contamination, some studies separated cases and controls by a distinct time period or used historical controls (Saunders and Carroll, 1988; Jones and West 1985; Long *et al.*, 1995); however, this introduces the possibility of change over time. The incidence of breastfeeding is currently increasing steadily in Scotland, therefore the variable of time may have had a greater effect on breastfeeding than a geographical variable where the two communities have been shown to be socially and demographically comparable (see above). In addition, recruiting intervention and control subjects from distinct time periods would have failed to secure an adequate sample size in the time available.

In the event, a community effect was demonstrated and the breastfeeding Helpers were often sought by members of the community to assist friends and relatives to breastfeed. The spontaneous publicity generated by their efforts to promote breastfeeding would also have proved difficult to contain within a randomised-controlled trial.

The loss of data relating to infant feeding in this study was relatively low, mainly because missing data could be collected from case records. However, lack of completed questionnaires, particularly at six weeks, resulted in a paucity of qualitative data. Therefore while it was possible to establish if someone had given up breastfeeding in the postnatal period it was often not possible to determine the reasons for this.

7:2. The feasibility of recruiting and training lay breastfeeding counsellors

7:2:1. Recruitment

It was hypothesised that peer counsellors would act as positive role models because they were similar to the intervention subjects. Although no formal evaluation was carried out, there was no reason to suspect that these women were very different from the intervention subjects. The six Helpers who were with the study for the first two years were within the age range of the study subjects, two at the older end, two at the younger end and two who were approximately the average age of the sample. Three of the six smoked (50% versus 62% of the intervention population), although one gave up during the study. Four were eligible for milk tokens (67% versus 40% of the intervention). Milk tokens were associated with a statistically significantly reduced intention to breastfeed and initiation of breastfeeding among study participants, therefore the higher incidence of milk tokens among the breastfeeding Helpers probably reflects the small number of Helpers. Five of the six (83%) lived in an area categorised as Depcat 7. The one Helper who lived outside the intervention area was perhaps least like the intervention sample. However, as she had grown up in the intervention area it was felt that she was able to empathise with the intervention mothers. The main difference related to previous breastfeeding experience (100% of the Helpers versus 10% of the intervention).

Local health professionals, mainly health visitors, recruited the Helpers. This served not only as a means of assessing suitability for the role but also involved the health professionals in the development and establishment of the peer counselling process. This may partly explain the health professionals' positive attitude and the support they gave the study as noted in Chapter 6. This study differs from other studies using community lay counsellors in that other studies do not appear to record how the counsellors were selected or how closely they resembled the target group. Most of the studies tended to assume that either because the counsellor lived in the same area as the mother, was of similar ethnic origin or had shared a common life experience that she/he could offer peer support (Spencer *et al.*, 1989; Kistin *et al.*, 1994; Long *et al.*, 1995; Wright, 1996).

At the end of the first year of the intervention one of the breastfeeding Helpers left due to changes in her personal circumstances. A second Helper left about six months after this date. As the Helpers had worked very closely together they found it difficult to accept the possibility of new members joining them in the study. At the same time, however, the intervention requirements were very time consuming for the remaining four Helpers. After much discussion it was decided to recruit some new Helpers from among the mothers previously supported to breastfeed by the study. It may have been easier for the Helpers to accept changes if a regular recruitment protocol had been built into the intervention from the outset. Other reports of peer support projects do not provide information on how the initiatives were sustained over defined time periods.

7:2:2. Training

The initial training provided in Easterhouse was a prototype of a series of workshops which are now marketed by Jenny Warren as the B.E.S.T. Breastfeeding Course (J. Warren, personal communication). These workshops were thought to be sufficiently flexible to be used in any environment with any group of people. The workshops were used twice, once at the beginning of the intervention (1994) when the workshops were being devised and later the finished version was used at the repeat training in 1997. Some of the same members attended both workshops. It was felt that the initial workshops were very appropriate for Easterhouse, they were well received and it was thought that they adequately prepared the Helpers for the task of promoting and supporting breastfeeding. The second phase of training comprised a more standard series of workshops. These appeared to be less well received and some of the content was thought not to be appropriate for Easterhouse and the role of the Helpers. Teaching methods had also changed with less emphasis on participation and group work and greater emphasis on more passive teaching methods. This might indicate the need to design workshops to be specific to the local community and the abilities of those attending. Comments from the participants seemed to suggest that workshops to enable lay workers to promote breastfeeding (in a community where breastfeeding is relatively rare) should be designed with this end in mind.

In peer counsellor studies that have taken place in Britain, the authors indicated that counsellors were trained but no details were given of the type or effectiveness of the training (Spencer *et al.*, 1989; Wright, 1996). In America, the Utah Peer Counsellor

programme describes a fairly extensive training programme and required the peer counsellor to pass a final examination. The training provided was a combination of known and specially developed training modules and supervised counselling. Two counsellors were trained (Long *et al.*, 1995). In Chicago, peer counsellors received training "which had been influenced by the philosophy and techniques of Paulo Friere". This covered a wide topic area and was complemented by continuing support. It was suggested that this type of training, which empowered the counsellors, was part of the reason for a positive result (Kistin *et al.*, 1994).

After completing the initial training, the Helpers attended a number of conferences and study days in order to keep up with developments in an expanding field. Weekly support meetings were also held where the Helpers were encouraged to share their experiences. This provision of on-going support and training was felt to be essential to providing the Helpers with the confidence to support and encourage mothers and to provide the best possible information to the study participants. Support meetings were an important component in standardising the intervention. However, a study by Kistin *et al.*, (1994) noted that despite intense supervision there were still differences in the level of support provided by volunteer lay breastfeeding counsellors. This was also true of the present study.

Thus to summarise, it was possible to recruit and train women to become peer counsellors but more difficult to sustain the initiative as their personal circumstances changed. Training must be specific for the needs, abilities and goals of those involved and must be complemented by continuing support. To ensure continuation of an effective intervention, recruitment and training of new members must be incorporated into the project design.

7:3. Ensuring a specified number of personal contacts between the local counsellors and all mothers

The protocol specified that each woman would receive two antenatal and two postnatal visits. During the planning phase however, it was decided that women who were bottle-feeding would not require postnatal visits and that breastfeeders could receive more than the two specified visits.

7.3.1 Antenatal visits

Antenatal visits aimed to inform mothers of the benefits and practicalities of breastfeeding and advise them that breastfeeding support and encouragement were available. Women were not obliged to breastfeed but were given sufficient information to enable an informed choice.

The majority of women (71%) recruited to the project received at least one antenatal visit and 37% received the stipulated two visits. However, many visits made by the Helpers were unsuccessful in contacting the women or her family (see Section 6:2:1). The lack of contact due to women not being in when visited (14%) was comparable to the South Manchester Family Worker Programme where almost 14% were not in when visited by volunteer mothers (Spencer *et al.*, 1989). In two randomised-controlled trials where emotional and social support was offered by trained midwives, over 90% of participants were successfully visited at home (Oakley *et al.*, 1990; Bryce *et al.*, 1991). In one study the lack of contact could be attributable to premature delivery (7%) or patient refusal (2%), (Bryce *et al.*, 1991). In the other study only 2% of participating mothers did not receive a home visit (Oakley *et al.*, 1990). Neither study mentioned mothers not being at home for the visits. It may have been that most of the home visits were pre-arranged by telephone, although this was not recorded in the text. It is possible that home visits by health professionals are actually more acceptable to women than visits by unknown volunteers. However, comments from women and their relatives visited during this project seemed to suggest otherwise.

The provision of antenatal information was an important component of this study because so few women in the study areas actually intended to breastfeed in early pregnancy. However, the manner in which information was provided was relatively inefficient. The Helpers also found that it was difficult to maintain enthusiasm when many calls were unanswered. In financial terms it was costly to pay expenses for visits which would not increase breastfeeding. It was not appropriate to request telephone contact prior to a home visit because a number of the study participants did not have a telephone. It was also thought that study participants might be more receptive to the breastfeeding message if they met the Helpers face-to-face rather than by telephone. To avoid the large number of unsuccessful visits it might have been more appropriate to target antenatal mothers at the antenatal clinic and offer a follow-up home visit after personal contact in the clinic setting.

Indeed several mothers commented that if they had realised that the Helpers were mothers like themselves they would have made more of an effort to contact them. As local publicity increased, the community became more receptive to receiving visits and to discussing breastfeeding. Perhaps antenatal women needed better explanation of the project and who the Helpers were.

The Helpers started visits in November 1994, but were initially daunted by the task. They expressed the belief that women did not breastfeed because they did not know the benefits and when told of the benefits would breastfeed. Later it became obvious that the decision was more complicated and that embarrassment was one of the key factors. The influence of family and friends was also recognised. With experience, the Helpers began to identify their role as enabling women to make an informed choice, to take rejections less personally and to accept the right of each woman to choose how to feed her baby. The Helpers also recognised the importance of providing information to the mothers' support network and including them in discussions where possible. A number of other studies have alluded to the influence of the peer and family group (Houston and Howie, 1981; Bloom *et al.*, 1982; Neyzi, *et al.*, 1991b; Bryant *et al.*, 1992) but few have included them in their attempts to promote breastfeeding. An American survey (Libbus, 1994) of agencies providing lactation education services to economically disadvantaged women demonstrated that a "significant other" was rarely encouraged to attend breastfeeding classes. Two agencies stated that the inclusion of a "significant other" was contrary to operative policy. An intervention study, which successfully increased the duration of breastfeeding in an intervention group, requested the mother, mother-in-law or other close relative to be present at educational and support sessions (Neyzi, 1991b). The present study provided breastfeeding information and support in the informal atmosphere of the mother's home with the added benefit that others present in the house at the time of the visit were included in the session. As one Helper remarked "*they* (the relatives) *are there 24 hours, we've got to win them over because the mother is left with them after we've gone*".

Preparation for visits had taken the form of role-play where only one Helper and the "mother" interacted. In reality this rarely happened mainly because the Helpers worked in pairs and secondly because if the study subject was at home she was rarely alone. Preparation might have been more useful if the Helpers had also practised group situations.

Possibly because of the manner used to teach role-play in the training programme, the Helpers developed their own methods of dealing with events. This might be more commonly recognised as a type of motivational interviewing (Miller and Rollnick, 1991). Women who were obviously very opposed to breastfeeding were respected for their beliefs and, if appropriate, literature was offered. It was then up to that mother to make any further contact. Women who were unsure how they intended to feed their baby were offered the opportunity to discuss their choice, given literature and contacted after a period of time during which they would have had an opportunity to read the literature and to think over their decision. Women who had made a definite decision to breastfeed were given the opportunity to ask questions, given literature if required and contacted nearer delivery to ensure postnatal support.

These visits did not duplicate any other pre-existing services as no such similar service existed and antenatal classes were attended poorly by women from this area (less than 33%). The visits did not appear to adversely affect routine services. The lay workers and health professionals in the community were mutually supportive. During visits, the Helpers discussed all the support available for breastfeeding mothers and referred women to the appropriate health care professional if required.

7:3:2. Postnatal visits

It was soon recognised that a number of the mothers required more than two postnatal visits. While some mothers were able to breastfeed successfully with minimal input others required to be visited at least once a day. Generally, mothers were visited according to need, which was greatest for first time mothers, those having problems or those living in a less supportive environment. In addition, the level of support a mother received appeared to depend on the commitment or availability of her Helper. Some Helpers were extremely enthusiastic and gave very strong support whereas others tended to leave it to the mothers to make contact. However, this did not appear to have had any greatly different impact on breastfeeding rates. Kistin *et al.* (1994) also noted inconsistencies in the provision of peer support despite intense supervision. In terms of duration of breastfeeding, it appeared that the sooner a mother was visited on discharge from hospital the more likely she was to be still breastfeeding at the Helper's first visit. The mothers who received more frequent support appeared to continue to breastfeed for longer; however, the numbers were too

small and data too sparse to enable proper analysis. Some mothers, generally those living in a supportive environment, were happy to receive support by telephone.

Most other studies providing postnatal support offered the support on a regular basis rather than responding to the mother's needs. Many of the studies which had a positive impact on breastfeeding duration had a regular format for postnatal support e.g. Houston *et al.* (1981) provided fortnightly visits; Neyzi *et al.* (1991b) offered monthly support; and Bloom *et al.* (1982) offered weekly telephone calls. It may be more effective to have a programme of support arranged for the mother so she knows what to expect rather than relying on the Helpers' perception of the mothers' needs or on the mother having the courage to contact the Helper. Where support was planned regularly "mothers knew when to expect a visit and could tolerate problems better" (Houston *et al.*, 1981). In agreement with another study (Lynch *et al.*, 1986) few mothers voluntarily contacted the Helper for support. Those who did had generally built a very good relationship with their Helper. It was presumed that the present study would work better if the Helper were able to respond to the need of individual mothers as well as her own personal commitments. However, an evaluation of peer support in America demonstrated increased duration of breastfeeding at three months when postnatal visits were made according to a protocol at one, two, four and six weeks (Long *et al.*, 1995).

7:4 Evaluating the acceptability of the intervention in the target area

7.4.1 Acceptability to mothers and health professionals

It might be expected that health professionals would not be in favour of lay support for breastfeeding. Midwives tend to perceive breastfeeding support as their remit but health visitors would argue that it is theirs, while lay counsellors may be perceived as "meddling amateurs" (Spiro, 1984).

It was therefore surprising to find that community-based health professionals appeared very supportive of the study as demonstrated by the positive remarks noted in Chapter 6. Midwives, health visitors and obstetricians referred women who were interested in breastfeeding or required extra support to the project. When applying for extra funding, the

Easterhouse Breastfeeding Promotion Group was supplied with a number of letters of support from those staff members. This positive attitude may reflect the involvement of the health professionals from the beginning of the study.

Despite this, a lack of support was voiced by a small minority of health professionals. It was suggested that volunteers working in the local hospital would diminish the role of the midwife. As the Helpers became better known it appeared to become accepted that their role was complementary to that of the midwife and health visitor and that the mothers appreciated the support and encouragement. Spiro (1984) also noted that health professionals became more accepting to volunteer counsellors as they worked together.

As reported in Chapter 6, the mothers appeared to find the intervention to be acceptable. Only three intervention mothers (less than 1%) requested not to be visited prior to Helper allocation and a further nine (2%) declined visits after being allocated to a Helper. This compares favourably with the Manchester Family Worker Project where 30% of an experimental group refused support either because they were "not interested" (8%) or had "enough support" (22%) (Spencer *et al.*, 1989). However, the number of women in the present study who were not at home when visited by arrangement may suggest that the project was not acceptable for some of the mothers but may have been difficult to refuse when face-to-face with a volunteer.

In a community with a history of low breastfeeding rates it might be expected that this study would have been unacceptable to the majority of mothers. It might be assumed that mothers, particularly those intending to bottle-feed their infants, would be unwilling to discuss infant feeding with breastfeeding advocates; however, this was not the case. The positive acceptance of the Helpers may reflect their local knowledge and the fact that they were participating and recognisable members of the community. It may also reflect their enthusiastic and sensitive approach and their use of colloquialism and humour.

7:5 Impact on breastfeeding intentions and frequency (up to six postnatal weeks)

7:5:1 Antenatal intention

The study demonstrated a significant increase in the breastfeeding intention of the intervention sample compared to the control sample during pregnancy (booking to return).

In agreement with nationally collected data (White *et al.*, 1992; Foster *et al.*, 1997), the majority of study participants had decided how they would feed their baby prior to attending the booking clinic. Very few participants changed their feeding intention during pregnancy and most of the change that did occur was in the direction of bottle-feeding. Other studies which examined breastfeeding behaviour noted that postnatal breastfeeding was strongly associated with antenatal intention (Lynch, *et al.*, 1986; Hauck and Dimmock, 1994; Schy *et al.*, 1996).

Compared to the nationally collected data, fewer study participants intended to breastfeed at booking. This was to be expected given the socio-economic background of the participants (Foster *et al.*, 1997). In this study socio-economic background was determined by deprivation category according to area of residence (Carstairs and Morris, 1991). Nationally collected data (Guthrie and ONS) demonstrate low breastfeeding in areas of high deprivation such as the areas selected for this study.

Although the proportions intending to breastfeed in the intervention and control groups were not significantly different at either booking or return, the increase in intervention mothers intending to breastfeed between booking and return was statistically significant. Since intention reflects attitude, this suggests a change in attitude in favour of breastfeeding among the intervention group. Relating to the Health Action Model (see Chapter 2), this might suggest the beginnings of change in the intervention area that might precede an actual change in feeding behaviour. A number of evaluation studies demonstrated that a positive attitude to breastfeeding was strongly associated with increased initiation of breastfeeding (Baisch, 1989; Dix, 1991; Cassidy, 1992). One published intervention study recorded an increase in positive attitude to breastfeeding and an increase in actual breastfeeding (Rossiter, 1994). Other studies have recorded increases in breastfeeding knowledge but

showed no difference in attitude or breastfeeding behaviour (Kaplowitz and Olson, 1983; Hill, 1991). Although the present study did not measure attitude itself, it could be postulated from previously published research that the increase in intention to breastfeed during pregnancy reflected an increase in positive attitude to breastfeeding.

At booking there were significantly more undecided subjects in the intervention group and significantly more bottle-feeders in the control group. It may be assumed that "undecided" was selected by those who were genuinely undecided about feeding method and also by those who intended to bottle-feed but did not wish to admit this when participating in a study that was attempting to increase breastfeeding (the Hawthorne Effect). There were therefore two possible reasons for the large difference between the intervention and the control groups. Firstly, the "undecided" subjects in the intervention group may be more at risk of the Hawthorne effect because their local community was involved in the initiative, because the Helpers were local mothers and because they might be more aware of the aim of the intervention. Secondly, a change took place in the booking procedure for the control group whereby the majority of women received a home visit from a community midwife prior to the booking visit at the clinic. The midwife may have given women sufficient information to enable them to make a feeding decision prior to the clinic visit when the first questionnaire was completed. The control "undecided" may therefore reflect those who were genuinely undecided whereas the intervention "undecided" may reflect those who intended to bottle-feed but did not wish to admit it. The proportions of the intervention group having decided or not decided on feeding method at booking closely resemble those of Cassidy's study (1992) of primigravid mothers booking at Glasgow Royal Maternity Hospital. Control group data does not resemble any of the recent data collected in Glasgow (Cassidy, 1992; Elton, 1994; Britten *et al.*, 1997). Therefore, it appears likely that the change in booking procedure may offer the more plausible explanation for a smaller proportion of undecided in the control group compared to the intervention group.

This might also offer an explanation for why a significantly higher proportion of the control group intended to bottle-feed at the booking visit, although it could be expected that the Hawthorne effect would have had an impact here.

Kaplowitz and Olson (1983) suggested that mothers who were undecided would be more responsive to an intervention because they lacked an established belief system. Therefore, it

was predicted that the significant increase in breastfeeding in the intervention group during pregnancy reflected the larger intervention "undecided" group having made a feeding decision. In fact the increase reflected a greater proportion of intervention subjects who intended to breastfeed at booking maintaining their decision. Conversely, a larger proportion of the control group who stated an intention to breastfeed at booking changed to bottle-feeding at return. The proportion of "undecided" mothers who changed to breastfeeding during pregnancy was slightly higher in the control than in the intervention group. In other published studies the group who decided to breastfeed in late pregnancy were more responsive to the intervention (Kaplowitz and Olson, 1983; Lynch *et al.*, 1986).

Antenatal intention strongly predicted postnatal behaviour. Very few mothers who stated an intention to bottle-feed changed to intending to breastfeed. Although more intervention than control subjects who stated an intention to bottle-feed at booking changed to breastfeeding during pregnancy this was not statistically significant. Many studies have found it very difficult to induce change when a mother has decided to bottle-feed (Gilmore *et al.*, 1979; Hill, 1987; Swanwick, 1992). However, it has been demonstrated that feeding intention could change if the subject was exposed to someone speaking positively of the advantages of breastfeeding. (Kistin *et al.*, 1990; Bryant, 1992). The number changing to breastfeeding in this study was very small; it may be that a larger study over a longer period of time may have a greater effect.

Antenatal intention to breastfeed was less clear in predicting breastfeeding behaviour. In the intervention group, intention to breastfeed at booking was a stronger predictor for feeding behaviour than intention to breastfeed at return. The opposite was true for the control group. This might suggest that intervention subjects stating an intention to breastfeed at the end of pregnancy may include those mothers who felt unable to record a true intention to bottle-feed because of the input from the intervention (Hawthorne Effect). It may also reflect the certainty of the mother's decision, that although the mother wished to breastfeed she lacked the confidence to put her intention into practice (Buxton *et al.*, 1991). Control subjects stating an intention to breastfeed at booking may include a number who were genuinely undecided or who intended to bottle-feed but had been influenced by the visit from the midwife to state an intention to breastfeed (Hawthorne Effect). By the end of pregnancy, these subjects may have felt more able to record their true feeding intention.

The majority of published studies which examine antenatal feeding intention tend to focus on the knowledge and attitude of the mother in the belief that information will change both knowledge and attitude and this will result in a change in feeding behaviour. Written materials have often been found to change knowledge but have little influence on attitude and behaviour (Gilmore *et al.*, 1979, Kaplowitz and Olsen, 1983; Swanwick, 1992). Individual counselling or group discussions have been more effective but impact varies depending on presentation and on the target group (Mazen and Leventhal, 1982; Hill, 1987; Rossiter, 1994). Very few published studies follow women from early pregnancy and so are unable to record changes occurring in intention during pregnancy. In a study which did follow-up women during pregnancy, a pre-test completed in early pregnancy (4-6 months) and repeated in late pregnancy (6-8 months) demonstrated a change in breastfeeding knowledge in the group which had received a series of pamphlets but did not show any difference in attitude or in initiation of breastfeeding. There was no measure of breastfeeding intention in that study (Kaplowitz and Olsen, 1983).

The impact of the present study was presented on an intention to treat basis whereby the intervention group was analysed as a whole whether they received antenatal visits or not. Just under 30% of the intervention sample were not visited and 67% did not receive two antenatal visits. It is possible that a greater effect might have been demonstrated if more of the intervention group had received a visit and if more had received two visits.

It therefore appears that the intervention was successful in encouraging women who expressed an interest in breastfeeding to maintain their choice throughout pregnancy. Where no such encouragement was offered a number of women changed their intention in favour of bottle-feeding. The intervention did not significantly influence the intention of those who were undecided or who had decided to bottle-feed.

7:5:2 Postnatal behaviour

It was hypothesised that more of the intervention participants who intended to breastfeed would breastfeed, more of those who did not intend to breastfeed would breastfeed and that those who initiated breastfeeding would breastfeed for longer when compared to the control participants.

Feeding behaviour, which is the outcome of intention and any influences during pregnancy, corresponded closely to antenatal intention in both groups. When the intervention and the control groups were compared at each point of data collection, there were no differences in the proportions breastfeeding at delivery, discharge and six weeks. However, multivariate analysis demonstrated that intervention group subjects were significantly more likely to initiate breastfeeding when compared to control group subjects. No differences were demonstrated at six postnatal weeks.

The correlation between antenatal intention and postnatal behaviour is supported by the work of Tones and Tilford (1994). They suggested that while providing information may result in a change in attitude and intention, other facilitating factors were required to produce a change in behaviour. Auerbach (1990b) also advocated the encouragement of breastfeeding through health education but suggested that this would be ineffective if the breastfeeding mother was not supported and if breastfeeding was not protected in the wider society. Kelly *et al.* (1993) identified four levels of health promotion (environmental, social, organisational and individual) and suggested that for health promotion programmes to be effective they should have an integrated approach to all four levels and that the relationship of the individual to the other areas should be considered.

Breastfeeding is a healthy behaviour, however, the impact on morbidity and mortality generally occurs some time after the event. Fredrickson (1993) makes comparisons with smoking cessation and suggested that policy change and financial incentives are instrumental for protecting and promoting the healthy option. He also noted that policies (relating to smoking) were changed only after accumulation of exact probabilities and financial implications of death and disease and suggested that similar information relating to breastfeeding could act as an incentive to induce policy change and so protect and support breastfeeding in society.

The limited impact of this study may therefore reflect the lack of integrated approach and while women may change their intention to breastfeed they lacked the support and facilitating factors which would enable them to breastfeed beyond the first few days.

It was assumed, at the outset, that the intervention and control communities were equally disadvantaged, but this was not the case. Since the control group was less deprived than the

intervention group it was therefore postulated that the impact of the intervention might be greater if the two groups were more equal. On further analysis of the data, omitting control subjects who did not reside in a highly deprived area, the impact of the intervention on breastfeeding appeared greater: significantly greater proportions of the intervention group initiated breastfeeding ($p<0.05$) and were breastfeeding at hospital discharge ($p<0.05$) compared to the control group. A significantly greater proportion of the intervention group was also exclusively breastfeeding at six weeks ($p<0.05$) when compared to the control group. This suggests that the more affluent control mothers were more likely to breastfeed successfully when compared to their less affluent counterparts. This observation, which has been reported by a number of infant feeding surveys (McIntosh, 1985; White *et al.*, 1990, Cassidy, 1992; Foster *et al.*, 1995), might reflect the good support networks that exist in more affluent areas.

It was originally hypothesised that this study would induce a community effect and although it was targeted at a socio-economically disadvantaged area, it was assumed that the intervention subjects would respond equally regardless of socio-economic background. From the data available it was not possible to accept or reject this assumption since all of the intervention subjects resided in a highly deprived area. However, other published studies have noted differing responses depending on socio-economic group (Kirk, 1976; Houston *et al.*, 1981; Jones and West, 1985).

Postnatal infant feeding behaviour might reflect current practice in each of the hospitals. However, infant feeding audits have reported that differences in feeding behaviour in different maternity hospitals actually reflected client background rather than hospital practice (Elton, 1993; Britten *et al.*, 1997). The fact that this study demonstrated significantly different breastfeeding practices in two hospitals when comparing women from similar socio-economic backgrounds, suggests variations do exist in hospital practice.

7:5:2:1 Feeding behaviour of participants stating an intention to breastfeed

Intervention group mothers who stated an intention to breastfeed at booking were significantly more likely to initiate breastfeeding ($p<0.01$), to be breastfeeding at hospital discharge ($p<0.01$) and to be breastfeeding ($p<0.05$) and exclusively breastfeeding ($p<0.05$) at six weeks when compared to control group mothers. The intervention was therefore

successful in encouraging more of those who intended to breastfeed in early pregnancy to breastfeed successfully to six weeks. Kistin *et al.*, (1990) noted that mothers exposed to an intervention were more likely to follow through their antenatal plan to breastfeed. Many other studies which successfully increased the duration of breastfeeding or promoted exclusive breastfeeding only targeted those women who already intended to breastfeed (Grossman *et al.*, 1990; Pugin *et al.*, 1996; Schy *et al.*, 1996).

7:5:2:2 Feeding behaviour of participants not stating an intention to breastfeed

In this study, mothers stating an antenatal intention to bottle-feed were extremely likely to be bottle-feeding at six weeks especially if this was the stated intention towards the end of pregnancy. This agrees with other studies (Grossman *et al.*, 1989; Elton, 1993). In a study of feeding practices among low-income, high-risk women, only 3% of those intending to bottle-feed in early pregnancy initiated breastfeeding, 33% of the undecided group breastfed and 31% of those intending to breastfeed actually bottle-fed (Grossman *et al.*, 1989). These figure were very similar to those obtained for the control group in this study (3%, 35% and 36% respectively), but differ from the intervention group (6%, 20% and 18% respectively). This might indicate that changes took place in the intervention group in favour of breastfeeding although these were not statistically significant.

A small number of study subjects indicating an antenatal intention to bottle-feed initiated breastfeeding but very few of them breastfed for longer than the first few days. This was especially true if the stated intention at the return visit was to bottle-feed. Again this might reflect the certainty of the feeding decision (Buxton *et al.*, 1991). Despite the close relationship of antenatal intention with postnatal feeding, Kistin *et al.*, (1990) demonstrated that mothers stating an intention to bottle-feed might be persuaded to initiate breastfeeding.

It has been suggested that women who are undecided about infant feeding would be more easily influenced and that breastfeeding promotional efforts should be directed here. For instance, a series of educational pamphlets had greatest influence on women who were unsure about feeding (Kaplowitz and Olsen, 1983). However, in the present study few of those who were undecided at return were breastfeeding at six weeks (no intervention subjects and three control subjects). Thus it appears that the intervention was not able to influence the behaviour of the small group of mothers who made their decision during

pregnancy. This compares less favourably with a trial of educational and supportive home visits which increased breastfeeding duration only in the subgroup which had decided to breastfeed in late pregnancy (Lynch *et al.*, 1986).

In other studies examining breastfeeding intention and behaviour, about three quarters of those who were undecided actually bottle-fed at delivery (Elton, 1993, Britten *et al.*, 1997). The present study reflects these results in that 75% of all subjects who were undecided at booking, bottle-fed at delivery. However, fewer intervention subjects (20%) who were undecided at booking initiated breastfeeding compared to control subjects (35%). The reason for this large difference may lie in the reason why there were fewer undecided in the control group in the first place. It may also be a reflection of the smaller number in the control undecided group resulting in statistical bias. The final possibility may be that the intervention gave mothers who were unsure, information that encouraged them to choose not to breastfeed.

7:5:2:3 Impact of the intervention on the duration of breastfeeding

It was hypothesised that this study would increase breastfeeding duration because in addition to supplying information it provided a role model and offered postnatal support. Health education has been shown to be effective when combined with personal support (Gepkens and Gunning-Schepers, 1996). However there were no significant differences in the proportions of intervention and control mothers breastfeeding at six weeks.

When the two groups were matched for deprivation status the prevalence of breastfeeding in the intervention group was significantly greater than in the control group. Significantly more intervention than control subjects were breastfeeding at delivery and discharge but by six weeks there were no differences in the proportions breastfeeding. Although at six weeks a significantly greater proportion of intervention than control subjects was exclusively breastfeeding. Multivariate analyses, which controlled for other confounding variables, demonstrated a statistically significantly greater likelihood of an intervention subject initiating breastfeeding at delivery. However there were no statistically significant differences at six weeks. These results suggest that peer support had had a limited impact on the duration of breastfeeding.

The positive effect of the role model may have been outweighed by the influence of friends and family (Bryant, 1982, Baranowski, *et al.*, 1983, Bryant, *et al.*, 1992). Svenson and Hanson (1996) suggested that behaving in a socially acceptable manner induced feelings of confidence. Breastfeeding in a non-breastfeeding culture is not socially acceptable and is therefore unlikely to induce feelings of confidence. Low levels of maternal confidence have been associated with reduced duration of breastfeeding (Loughlin *et al.*, 1985; Buxton *et al.*, 1991; O'Campo, 1992). Buxton also associated breastfeeding duration with the certainty of the decision to breastfeed. If the mother was not convinced about her decision to breastfeed or had decided to maybe "*gie it a go*" (Gribble, 1996) then she would be more likely to cease breastfeeding prematurely.

Some studies have demonstrated that breastfeeding duration can be increased with intensive postnatal support (Houston *et al.*, 1981; Bloom *et al.*, 1982; Neyzi *et al.*, 1991b). Other studies providing support have shown no effect on the duration of breastfeeding (Grossman *et al.*, 1990; Schy *et al.*, 1996). There are several possible reasons for the present study's limited impact on the duration of breastfeeding. Firstly, those who made the decision to breastfeed during pregnancy may have been committed to attempting breastfeeding but less committed to continuing breastfeeding. This might indicate a change in attitude to breastfeeding rather than a change in infant feeding behaviour. Secondly, the Helper was often informed of the delivery some time after the event thus delaying the first postnatal visit. If the mother was not visited in the first week after discharge from the hospital it was very usual for her to have given up breastfeeding prior to the Helper's visit. The first two weeks of breastfeeding are the hardest and a new mother attempting to breastfeed her baby without knowledgeable support would have been unlikely to persevere for long. Those mothers who did receive early visits often required intensive support from the Helper (e.g. daily visits plus telephone calls) to enable breastfeeding. Thirdly, it was difficult to compare the intervention and the control group in terms of duration of breastfeeding due to a lack of good data at six weeks. It was merely possible to state whether or not a mother was breastfeeding. Finally, the lack of impact at six weeks may reflect the fact that other facilitating factors had not been put into place (Auerbach, 1990b, Kelly *et al.*, 1993).

As a number of mothers had stopped breastfeeding prior to discharge from the maternity hospital it was unlikely that this could be prevented by community-based postnatal support.

Compared to the control population, the intervention population who were breastfeeding at hospital discharge were less likely to breastfeed for six weeks because a significantly larger number were combining breast and bottle-feeding. Supplementing breastfeeding with bottle-feeding in the early days is associated with early termination of breastfeeding (Feinstein *et al.*, 1986; Michaelsen *et al.*, 1994; Blomquist *et al.*, 1994). This may explain the greater loss in breastfeeding in the intervention group between hospital discharge and six weeks (-8% of the intervention and -6% of the control).

Actual duration of breastfeeding is often associated with the intended duration of breastfeeding (White *et al.*, 1992,). This association was also observed in two intervention studies (Hauck and Dimmock, 1994; Schy *et al.*, 1996). Information on the intended duration of breastfeeding was not collected antenatally in this study and the lack of good postnatal data meant that the intended duration and the actual duration of breastfeeding were not collected postnatally.

As a measure of postnatal impact, this study measured breastfeeding rates but did not measure other factors such as satisfaction with breastfeeding experience. Other published studies evaluated maternal perception of breastfeeding success (Wiles, 1984; Hill, 1987) or maternal perception of her baby (Wiles, 1984) as a study outcome. McNatt *et al.* (1992) noted that women who felt satisfied with their breastfeeding experience had twice as many informational support providers than women who did not feel satisfied. As the present study increased informational support it might have been useful to have assessed the impact of this on the mother's perception of her breastfeeding experience. In addition, McNatt *et al.* (1992) noted that a woman's perception of being supported was related to the number of people in her information and health care provider network.

The Manchester Family Worker programme which was unable to reduce the rate of low birthweight stated that "peer support increased the subjective well-being of clients" (Spencer *et al.*, 1989). It would be useful to know whether the provision of peer support made breastfeeding more socially acceptable, particularly in an area where there was a strong bottle-feeding culture. If a mother felt that her behaviour was more socially acceptable she would feel more confident about breastfeeding (Svenson and Hanson, 1996) and would be more likely to breastfeed for longer (Loughlin *et al.*, 1985; Buxton *et al.*, 1991; O'Campo, 1992).

Thus the intervention assisted mothers who intended to breastfeed to do so successfully but did not significantly affect the behaviour of those not stating an intention to breastfeed. When the two groups were controlled for other confounding variables, there was a statistically significant increase in breastfeeding at delivery but this was not sustained to six weeks.

7:5:3 Comparison of feeding behaviour in selected sub-groups

The incidence of Caesarean section (CS), premature delivery, low birthweight (LBW) baby and admissions to special Care Nursery (SCN) were all higher in the intervention group compared with the control group. The duration of breastfeeding has been reported to be reduced following the separation of mother and baby (admission to SCN) (Mobbs, 1973, Buxton *et al.*, 1991) and may be reduced following CS (Bruce, 1991) or where the baby was of low birthweight (Elton, 1993; Foster *et al.*, 1997). The influence of prematurity on breastfeeding is confounded by other factors, such as separation of mother and baby and delay in establishing breastfeeding, thus it could be hypothesised that this may interfere with the normal process of breastfeeding and result in a reduced duration of breastfeeding. Attendance at antenatal classes was higher in the control group and antenatal class attendance is generally associated with increased breastfeeding (White *et al.*, 1990. Foster *et al.*, 1997). Thus the variables that were more likely to result in a reduced incidence of breastfeeding were more common in the intervention group and the variable associated with a higher incidence of breastfeeding was more common in the control group. This suggests that any increase in breastfeeding within the intervention group was not confounded by other variables. Multivariate analyses did in fact indicate an effect in the intervention group, which had been masked by factors within the control sample.

The separation of mother and baby by admission to the SCN was likely to reduce breastfeeding and indeed in the control group, mothers whose baby was admitted to SCN were less likely to breastfeed despite their antenatal intention. However, the frequency of breastfeeding was highest in the intervention group whose babies were admitted to SCN.

Breastfeeding was also initiated by more of the intervention mothers delivered by CS than those who delivered normally. However, further analysis of the data showed that this actually reflected antenatal intention in that intervention group mothers who delivered by

CS were more likely to intend to breastfeed. In fact intervention group mothers who intended to breastfeed were statistically significantly less likely to deliver normally when compared to control group subjects who intended to breastfeed.

This seems to suggest that the intervention was successful in encouraging and protecting breastfeeding among vulnerable sub-groups.

A number of reported studies targeted primigravid women in the belief that they were more likely to respond to breastfeeding promotion (Bloom *et al.*, 1982; Wiles, 1984; Curro *et al.*, 1997). An intervention study designed to increase breastfeeding (Pugin *et al.*, 1996) demonstrated a significant increase in breastfeeding among primigravida but not among multigravida. The present study demonstrated no significant differences in the behaviour of primigravid or multigravid women. However, primigravid intervention subjects appeared most likely to initiate breastfeeding and be breastfeeding at hospital discharge than any other group.

7:5:4 Summary

This is the first report of a prospective controlled evaluation of a peer support programme to promote breastfeeding in a disadvantaged community.

If the intervention and study groups were compared without adjusting for possible influencing variables a higher prevalence of breastfeeding was not observed in the intervention population, however, there was a consistent trend in favour of breastfeeding. When the deprivation status of the control and intervention subjects were matched, a statistically significantly greater proportion of the intervention group were breastfeeding at delivery and discharge and exclusively breastfeeding at six weeks. Multivariate analyses demonstrated that intervention group subjects were statistically significantly more likely to initiate breastfeeding at delivery when compared to the control group. However by six weeks there was no difference between the intervention and control groups.

The intervention assisted those women who stated an antenatal intention to breastfeed to breastfeed successfully. Groups most at risk of bottle-feeding (e.g. where mother and baby were separated and those delivered by caesarean section) also breastfed more frequently in the intervention community.

The results suggest that the promotional efforts of the Helper may have succeeded in encouraging women to initiate breastfeeding. Lack of encouragement and support within the hospital environment may have resulted in supplementing breastfeeding with artificial milk which in itself can cause breastfeeding failure.

Assessment of breastfeeding initiation and duration may not be the most appropriate measure of the impact of this intervention, instead qualitative evidence may be more relevant. Comments from mothers assisted by the project demonstrated their perception of the value of the support. For most mothers breastfeeding appeared to have profound emotional implications. A number of mothers who did not succeed in their breastfeeding intentions stated immense feelings of failure and loss of self-esteem. Conversely mothers who breastfed successfully reported greater feelings of self worth. An important part of the Helpers' role was assisting those mothers who stopped breastfeeding prematurely to feel good about what they had achieved.

The results from the present study indicate that despite a lack of impact of the intervention at six weeks, a positive trend in favour of breastfeeding occurred in the intervention area. The study suggests that the development and evaluation of community based peer-support programmes may therefore offer an appropriate tool for improving low breastfeeding rates in socially disadvantaged areas.

Chapter 8:
Conclusions

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This study aimed to evaluate an intervention designed to increase the rate and duration of breastfeeding in a socio-economically-disadvantaged urban area by providing information and support in a locally acceptable manner.

The four study objectives were achieved:

1. ***Feasibility of recruiting and training lay breastfeeding counsellors*:**

It was possible to recruit and train local breastfeeding counsellors (Helpers) in an area where only 7% of babies were breastfed at the end of the first week. It was more difficult for the Helpers to be committed to the project over two years due to family obligations, changes in social circumstances and ill health. Those involved had a very high level of knowledge and were committed to promoting breastfeeding.

2. ***Ensure a specified number of contacts between the counsellors and mothers without duplicating or adversely affecting delivery of routine services:***

Attempts were made to visit all women recruited to the project. Two antenatal visits were often insufficient to enable face-to-face contact, although by delivery the majority of woman had been visited at least once. Most women were interested in listening to the Helpers; women intending to breastfeed appeared pleased that support was available and most of those intending to bottle-feed seemed interested in discussing breastfeeding. The intervention did not appear to duplicate or adversely affect routine services. The Helpers were aware that their role was to provide information and support but not to advise. Where non-breastfeeding problems occurred, women were referred to the appropriate health professional.

3. ***Assess acceptability of project to mothers and health professionals:***

Qualitative evidence suggested that mothers assisted by the group were positive about the support and about themselves. Local health professionals, who were supportive of the project, also reported a more positive attitude to breastfeeding and to breastfeeding mothers in the intervention area.

4. Impact on breastfeeding intentions and frequency:

There was a significant increase in the percentage of women intending to breastfeed during pregnancy in the intervention group compared to the control group. However, there were no significant differences in breastfeeding prevalence between the two study populations. When the intervention and control groups were adjusted for deprivation status, a statistically significantly greater proportion of intervention group subjects were breastfeeding at delivery and discharge and were exclusively breastfeeding at six weeks. A significantly greater proportion of the intervention population succeeded in their antenatal intention to breastfeed and vulnerable sub-groups may have been assisted to breastfeed by the intervention. Multivariate analyses demonstrated a statistically significantly increased likelihood of an intervention subject initiating breastfeeding when compared to control subjects. However, at six weeks there were no significant differences between the two groups.

In addition to the expected outcomes, there were other more unexpected results. Once started, the project gathered momentum, largely controlled by the Helpers who were very focused on breastfeeding promotion and the needs of mothers. This resulted in the project expanding beyond the four stipulated visits and responding to the needs of individual women. This project also increased the self-awareness and confidence of the group members.

The extent to which the results of this study can be generalised will be determined by socio-economic background of the target population. Due to the associated cultural characteristics of breastfeeding it may not be appropriate to replicate this model in all settings. In addition, it might not be appropriate to implement discrete parts of this project with the aim of increasing breastfeeding. The main components identified during this study were the Helpers (recognisable, local mothers); selection of the Helpers (by local health professionals); training and supervision (tailor-made for the abilities and needs of the Helpers, with on-going training and supervision to maintain knowledge and enthusiasm); the community (a socio-economically disadvantaged community, but definable as a community and receptive to the peer counsellor approach); the development of the intervention (able to grow and develop along with the Helpers) and finally, the study participants (all local mothers regardless of previous experience or feeding intention).

Chapter 9:

Recommendations for Future Efforts to Promote Breastfeeding in Disadvantaged Areas

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9.1 Health promotion

- Peer counselling support of breastfeeding should be regarded as a potentially effective tool to promote breastfeeding in deprived areas, if it is combined with a comprehensive strategy to address the various other factors that influence breastfeeding.

- Future peer support proposals might wish to consider a more organised protocol of postnatal support and a process by which the peer counsellor is informed of the delivery in a timely manner. Initial contact between peer counsellor and mother may be more efficient if it takes place in the antenatal clinic.

- To bring about any real change in the prevalence of breastfeeding, efforts should be directed towards women before they are pregnant (e.g. in schools, colleges and family planning centres), as well as throughout pregnancy and after delivery.

- Health promotion efforts should aim to increase the social acceptance of breastfeeding, both within the immediate social network of the mother and throughout the population as a whole.

9.2 Government legislation

- The provision of milk tokens of equal value for bottle and breastfeeders or tokens of higher value for breastfeeders may encourage mothers in more deprived areas to consider breastfeeding.

- Maternity leave should be reviewed and possibly extended to enable an increased duration of breastfeeding. For the mother who is returning to work, the working environment should facilitate breastfeeding by providing flexible working hours, breastfeeding/expressing breaks and facilities to express and store breastmilk.

9.3 Clinical

- All clinical staff (both in the maternity hospitals and the community) require regular updating about breastfeeding practices and attitudes.
- Increased numbers of appropriately skilled clinical staff may be necessary to enable breastfeeding mothers to receive the support they require.

9.4 Research

- Further research is necessary to establish exactly which population sub-groups might respond to the peer counsellor approach.
- The extent to which a woman is influenced by the attitudes of those in her immediate social network should be evaluated. Health promotion programmes could then build on this information.
- In areas where breastfeeding is not the cultural norm, short-term interventions are likely to demonstrate little impact on breastfeeding behaviour. It may be more useful to evaluate short-term interventions by other measures such as changes in attitude. The use of qualitative methodology may provide more meaningful results. Pre-tested attitude scales, such as the Iowa Infant Feeding Attitude Scale (C.I. Dungy – personal communication), are also useful evaluation tools.
- To enable the implementation of effective interventions, research is required to understand which factors influence specific target groups in their choice of infant feeding.
- National and local routine data on breastfeeding intentions and behaviour should be continuously analysed to enable changes to be monitored.
- To induce policy change, research is required to assess as precisely as possible the risks of morbidity and mortality and the financial implications associated with formula feeding.

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Appendices

Appendix I

The Baby Friendly Code of Practice

1. Have a written breastfeeding policy that is routinely communicated to all staff
2. Train all health staff in the skills to implement this policy
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Help mothers to initiate breastfeeding within half an hour of birth
5. Show mothers how to breastfeed and how to maintain lactation even if separated from their infants
6. Give new-born infants no food/drink other than breast milk unless clinically indicated
7. Practise rooming in 24 hours a day
8. Encourage breastfeeding on demand
9. Give no artificial teats or pacifiers to breastfeeding infants
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from hospital or clinic

Baby Friendly Hospitals: Code of Practice, WHO/UNICEF, 1989

Appendix II

Socio-economic Characteristics of Neighbourhood Types

Neighbourhood Type 1	Largely owner occupied housing, mainly professionals and non-manual workers.
Neighbourhood Type 2	Mainly owner-occupied housing, families with young children, professional and non-manual workers.
Neighbourhood Type 3	Mixed tenure accommodation, high proportion of families with no children, single persons and students. Mainly non-manual and professional workers.
Neighbourhood Type 4	Mainly inter-war local authority housing with ageing and elderly population.
Neighbourhood Type 5	Mainly post-war housing with young families and skilled workers.
Neighbourhood Type 6	Mixture of small rented furnished and owner- occupied households with shared amenities; single persons, students, immigrants and high unemployment.
Neighbourhood Type 7	Post war local authority housing with young families, high unemployment and mainly unskilled workers.
Neighbourhood Type 8	Mixed tenure but mainly local authority, vacant properties and small, overcrowded household sharing amenities. Ageing population with few children and high unemployment.

Source GGHB, 1989

Appendix III

Social and Demographic Characteristics of the Intervention and Control Groups

Table 1A - 1991 Variables (G15 and G34 only)

	Intervention (G34)	Control (G15)
% Population Permanently Sick	27	23
% Social Class IV and V	38	37
% Male Unemployment	41	34
% Local Authority Housing	80	81
% No Car	83	76

Table 1A: Source - GGHB, Census data, 1991

Table 1B - 1991 Variables (including G33.4 and G33.5)

	Intervention (G34)	Intervention (G33.4 & 5)	Control (G15)
% Population Permanently Sick	27	24	23
% Social Class IV and V	38	36	37
% Male Unemployment	41	37	35
% Local Authority Housing	80	NK	81
% No Car	83	80.5	76

Table 1B: Source - GGHB, Census data, 1991

Table 2 - 1992 Child Health Characteristics

	Intervention (G34)	Control (G15)
No. of Births	292	377
% Low Birthweight	10	10
% Not Breastfed	89	84
% Mothers who Smoke	48	51
% Fathers who Smoke	55	48
% Mothers under 20 years	17	15
% Mothers over 34 years	3.5	6.5

Table 2: Source - GGHB, 1992

Appendix IV

The Workshops: 14th September-10th October 1994

Day 1

Introduction to the course

Aims and objectives

Evaluation Quiz

Expectations of the course

Cultural and social influences on breastfeeding

Day 2

Breastfeeding in Britain

Discuss own breastfeeding experience

Lifeline

Anatomy and physiology of the lactating breast

Positioning and fixing

Day 3

Intervention free breastfeeding

A problem solving approach

Common problems - recognition, prevention and some solutions

Day 4

Communicating using active listening

Meeting other Health Workers

Support available

Day 5

Discuss checklists and leaflets

The Helpers role - problems or worries

Setting up a support group

Arrangements for follow up sessions

Appendix V

Antenatal and postnatal visit protocol

Easterhouse Breastfeeding Promotion Project

Guide for Helper's Meeting

This guide is designed to help you when you are meeting with women in early pregnancy. You do not have to follow it exactly, but it is there to help you if you need it.

Meeting 1: around 20 weeks

Introduce Yourself
The project (give outline of the aims)

Ask How she is keeping
If she has time for a brief chat.

If no time → Offer a leaflet
Give contact numbers

Or not interested → Offer a leaflet
Give contact numbers

If interested → Discuss breast-feeding informally.
Try to discuss:
- The benefits of breast-feeding
- How people are influenced in choosing how to feed their baby
- Your breast-feeding experience -if you feel it appropriate.

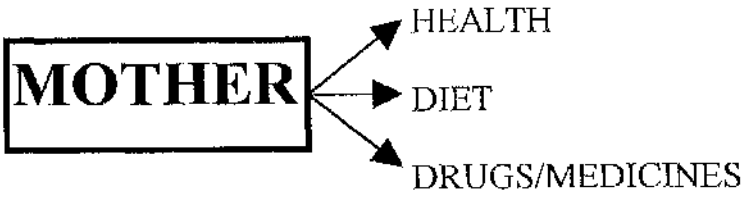
Length of each meeting will vary.
Some people will be interested and ask more questions, others may not be interested or may be short of time, while others may feel uncomfortable speaking to strangers for long periods. You should decide how much time you feel it is appropriate to spend at each visit.

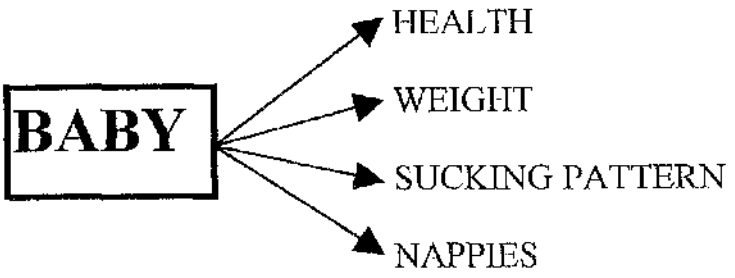
Don't rush Remember you will have the opportunity to meet again in a few months time, she can contact you at any time if need be.

When you come to leave, give out the leaflet with the phone numbers which can be contacted for further information.

AT EVERY VISIT:

CHECK!





Appendix VI

Questionnaires I-IV

Note: The same questionnaires were used for both the intervention and the control groups. However, the paragraph explaining the proposal on the cover of each questionnaire differed slightly between the intervention and the control groups. Therefore although only one copy of each questionnaire is enclosed, copies of the front sheets used for each of the groups are also included.

DRUMCHAPEL
ANTENATAL QUESTIONNAIRE
(TO BE COMPLETED AT BOOKING VISIT)

We are looking for information on infant feeding with the aim of increasing the number of women who breastfeed and the length of time they breastfeed for. In order to collect this information we will require you to complete a questionnaire at your Booking visit, when you return at 28-32 weeks and a further two more after you have had your baby. We will take your name and address in order to follow you up after your baby has been born, however any information you give us will be treated in strict confidence. *This project does not require you to breastfeed.* If you are willing to help, please fill in the questions below and return the completed form to the midwife you see in the clinic.

THANK-YOU.

PLEASE ATTACH ADDRESSOGRAPH LABEL HERE

GP's NAME:
GP's ADDRESS:

ESTIMATED DATE OF DELIVERY:

REFERENCE NO. D

GREATER EASTERHOUSE
ANTENATAL QUESTIONNAIRE
(TO BE COMPLETED AT BOOKING VISIT)

We are looking for information on infant feeding with the aim of increasing the number of women who breastfeed and the length of time they breastfeed for. In order to collect this information we will require you to complete a questionnaire at your booking visit, when you return at 28-32 weeks and a further two more after you have had your baby. We will record your name and address in order to follow you up after your baby has been born, however any information you give us will be treated in strict confidence. In addition, you will be visited in your home by a local woman who has breastfed her own baby to discuss infant-feeding. After you have had your baby, this same woman will visit you again to help you if you have chosen to breastfeed. *This project does not require you to breastfeed.* If you are willing to help, please fill in the questions below and return the form to the midwife who sees you in the clinic.

THANK-YOU.

PLEASE ATTACH ADDRESSOGRAPH LABEL HERE

GP'S NAME:
GP'S ADDRESS:

ESTIMATED DATE OF DELIVERY:

REFERENCE NO. E

PLEASE CIRCLE THE CHOICE CLOSEST TO YOUR FEELINGS; IF YOU DON'T KNOW PLEASE LEAVE BLANK

1. Have you decided how you are going to feed your baby? Yes / No

If yes, what method have you chosen

1. Breastfeed
2. Bottle feed
3. Other (Please explain……

2. Which of the following influenced your choice of feeding?(Please circle any)

1. Previous Experience
2. Better for the Baby
3. Easier/Convenient
4. Breastfeeding Embarrassing
5. Influence of Family/Friends
6. Influence of Midwife/Health Visitor/GP
7. Influence of Helper
8. Wanted to try
9. Didn't really think about it
10. Other (please explain)……
……

3. Have you discussed Infant Feeding with anyone? Yes / No

If yes, with whom? (Please circle any choice below)

1. Partner/Husband
2. Mother
3. Other relative
4. Friend
5. Midwife/Health Visitor/GP
6. Breastfeeding Helper
7. Other (Please explain)……

4a. Are you aware of the milk token scheme? Yes / No

4b. Do you receive them? Yes / No

4c. Could receiving milk tokens affect your choice of feeding? Yes / No

Please explain:……

……

ABOUT YOURSELF:

5a. Do you live:

1. Alone
2. With partner / husband
3. With own parent(s)
4. Other (Please explain).....

5b. Before this pregnancy, did you feel supported in your home circumstances? Yes / No

5c. Do you feel supported in this pregnancy? Yes / No

6a. In the last 12 months, were you a regular smoker? Yes / No

6b. If yes, will you continue to smoke in pregnancy? Yes / No

7. What is your date of birth? / /

8. How many weeks pregnant are you?
(Please write number of weeks in box)

9. Date questionnaire completed? / /199

IF THIS IS YOUR FIRST BABY, PLEASE STOP HERE AND RETURN THIS FORM TO PAT MAXWELL - THANK-YOU FOR YOUR HELP.

IF THIS IS NOT YOUR FIRST BABY, THEN PLEASE CONTINUE OVER THE PAGE.

PREVIOUS BABY

10. How many children do you have? (Please write number in box) ☐

11a. Did you breastfeed your last baby at all? Yes / No

11b. Did you bottle-feed your last baby at all? Yes / No

11c. Did you use any other method of feeding your last baby? Yes / No

Please explain.....

12. Why do you think you chose that method? (Please circle any choice/s)

1. Previous Experience
2. Better for the Baby
3. Easier/Convenient
4. Breastfeeding Embarrassing
5. Influence of Family/Friends
6. Influence of Midwife/Health Visitor/GP
7. Influence of Helper
8. Wanted to try
9. Didn't really think about it
10. Other (please explain).....
.....

13. Did you have any problems with feeding your baby? Yes / No

If yes, please circle any choices below

1. Vomiting
2. Refused to feed
3. Hungry/Frequent feeding
4. Painful
5. Mastitis
6. Other (Please explain).....
.....

IF YOU HAVE ONLY BOTTLE FED ALL YOUR BABIES, PLEASE STOP HERE AND RETURN THIS FORM TO PAT MAXWELL. THANK-YOU FOR YOUR HELP.

IF YOU HAVE EVER BREASTFED ANY OF YOUR BABIES OR MIXED BOTTLE AND BREASTFEEDING, PLEASE ANSWER THE QUESTIONS OVER THE PAGE.

PREVIOUS EXPERIENCE OF BREASTFEEDING

14. Which baby did you breastfeed? (Please circle any)

1. 1st baby
2. 2nd baby
3. 3rd baby
4. Other (Please explain)...

15. How long did you solely breastfeed for?

1. Up to 2 days
2. Up to 7 days
3. Up to 2 weeks
4. Up to 4 weeks
5. Up to 3 months
6. Over 3 months

16. What were the reason(s) for you stopping breastfeeding?
(Please circle any)

1. Satisfied with length
2. Family/friends embarrassed
3. Not enough milk
4. Tiring
5. Painful
6. Baby hungry
7. Not enough information
8. Influence of family/friends
9. Other (Please explain).....

17. Is there anything that could have been done to help you to breast feed for longer? Yes / No

Please circle any suggestion(s) below:

1. More help
2. Shown how to do it properly
3. Meeting other mothers who were breastfeeding
4. More encouragement
5. More information
6. Other (please explain).....
.....

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE PLEASE RETURN IT TO PAT MAXWELL IN THE CLINIC

If you wish further information or have any questions, please contact:

RHONA J. MCINNES
RESEARCH MIDWIFE
DEPARTMENT OF CHILD HEALTH
YORKHILL NHS TRUST HOSPITAL
G3 8SJ
0141 201 0411

DRUMCHAPEL
ANTENATAL QUESTIONNAIRE 2
(TO BE COMPLETED AFTER 28 WEEKS)

You may remember completing a questionnaire about infant feeding when you booked at the Health Centre in early pregnancy. By now you will be near the end of your pregnancy and may have made a decision on how you will feed your baby. In order to follow on from the previous questionnaire and to find out if you have changed your mind in any way, I would be grateful if you could complete the questions below and return this form to Pat Maxwell in the clinic. As before, we will record your name and address in order to follow you up after you have had your baby, however any information you give us will be treated with strict confidence.

THANK-YOU.

PLEASE ATTACH ADDRESSOGRAPH LABEL HERE

GP's NAME:
GP's ADDRESS:

ESTIMATED DATE OF DELIVERY:

REFERENCE NO. D

EASTERHOUSE
ANTENATAL QUESTIONNAIRE 2

You may remember completing a questionnaire about infant feeding when you booked at the hospital in early pregnancy. By now you will be near the end of your pregnancy and may have made a decision on how you will feed your baby. You may also have received information and advice from a breast-feeding Helper. In order to find out if you have changed your mind in any way and if you have found the Helpers to be useful, I would be grateful if you could complete the questions below and return this form to the midwife you see in the clinic. As before, we will record your name and address in order to follow you up after you have had your baby, however any information you give us will be treated with strict confidence.

THANK-YOU.

PLEASE ATTACH ADDRESSOGRAPH LABEL HERE

GP's NAME:
GP's ADDRESS:

ESTIMATED DATE OF DELIVERY:

REFERENCE NO. E

(from case-notes)

PLEASE CIRCLE RESPONSE CLOSEST TO YOUR FEELINGS
IF YOU DON'T KNOW, PLEASE LEAVE BLANK

1. Have you decided how you are going to feed your baby? Yes/No

If yes, what method have you chosen?

1. Breast-feed
2. Bottle feed
3. Other (Please explain)……

2. Why do you think you chose this method? (Please circle any)

1. Previous Experience
2. Better for the Baby
3. Easier/Convenient
4. Breast-feeding Embarrassing
5. Influence of Family/Friends
6. Influence of Midwife/Health Visitor/ GP
7. Influence of Helper
8. Wanted to try
9. Didn't really think about it
10. Other (please explain)……
……

3. Have you discussed feeding your baby with anyone? Yes / No

If yes, please circle any choice below

1. Partner/Husband
2. Mother
3. Other relative
4. Friend
5. Midwife/Health Visitor/GP
6. Breast-Feeding Helper
7. No-one
8. Other (Please explain)……

4a. Did you receive enough information on infant feeding in your pregnancy? Yes / No

4b. If no, what information would you have liked more of?
Please circle any

1. Breast-feeding information
2. Bottle feeding information
3. Feeding problems
4. Other (Please explain)…

ABOUT YOURSELF:

5a. Do you live:

1. Alone
2. With partner/husband
3. With own parent(s)
4. Other (Please explain).....

5b. Do you feel supported in this pregnancy? Yes / No

6a. Did you smoke regularly before your pregnancy? Yes / No

6b. If yes, have you stopped smoking during your pregnancy? Yes / No

7. How many weeks pregnant are you?
(Please write number of weeks in box)

8. Date questionnaire completed? / /199

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE
PLEASE RETURN IT TO YOUR MIDWIFE IN THE CLINIC

If you wish further information or have any questions, please contact:

RHONA J. MCINNES
RESEARCH MIDWIFE
DEPARTMENT OF CHILD HEALTH
YORKHILL NHS TRUST HOSPITAL
G3 8SJ
041 339 8888 EXT. 4411
041 337 2407

DRUMCHAPEL
POSTNATAL QUESTIONNAIRE 1

(To be completed on the 2nd postnatal day)

Congratulations on the birth of your baby!

Now that you have had your baby, we would like to ask you some more questions on feeding your baby and about any problems and/or help you might have had. As before, all information you give us will be treated in strict confidence. If you are willing to continue to help, please complete the questions below and return this form to the midwife in the ward.

THANK-YOU

PLEASE ATTACH ADDRESS LABEL HERE

DATE OF DELIVERY: / /199

DATE QUESTIONNAIRE COMPLETED? / /199

INTENDED DATE OF DISCHARGE: / /199

DISCHARGE ADDRESS, IF DIFFERENT FROM ABOVE:

REFERENCE NUMBER **D**

PLEASE CIRCLE YOUR CHOICE OF ANSWER:

1. How are you feeding your baby <u>now</u>? (Please circle <u>one</u> response)

1. Breastfeeding
2. Bottle-feeding
3. Both bottle and breastfeeding
4. Other (Please explain).....

2. Why do you think you chose this method? (Please circle <u>any</u> of the following)

1. Previous experience
2. Better for my baby
3. Easier/convenient
4. Difficult to feed in public
5. Influence of family/friends
6. Influence of medical staff
7. Influence of Helper
8. Wanted to try
9. Better for myself
10. Didn't really think about it
11. Family can help
12. Cheaper
13. Other (Please explain)
....
... ...
... ...

3. Did you discuss infant feeding with anyone? Yes / No

3b. If yes, please circle <u>all</u> of those with whom you discussed feeding:

1. Partner/husband
2. Mother
3. Other relative
4. Friend
5. Midwife
6. Breastfeeding Helper
7. Clinic/ward staff
8. Other (Please explain)
.....

4a. Have you had any problems feeding your baby? Yes / No

4b. <u>If yes</u>, which of the following did you have? (Please circle <u>any</u>)

1. Baby not taking feed
2. Frequent Feeds/Hungry
3. Feeding painful
4. Baby unsettled
5. Not enough milk
6. Vomiting
7. Baby losing weight
8. You were tired
9. Baby in Special Care Nursery
10. Other (Please explain)
... ...

4c. <u>If you had problems</u>, who has helped you? (Please circle <u>any</u> of the following)

1. Partner/husband
2. Own mother
3. Friends
4. Ward/medical staff
5. Other mothers in ward
6. Breastfeeding Helper
7. No help required
8. No help offered
9. Other (Please explain)
... ...

GREATER EASTERHOUSE
POSTNATAL QUESTIONNAIRE 1

(To be completed on the 2nd postnatal day)

Congratulations on the birth of your baby!

Now that you have had your baby, we would like to ask you some more questions on feeding your baby and about any problems and/or help you might have had. As before, all information you give us will be treated in strict confidence. If you are willing to continue to help, please complete the questions below and return this form to the midwife in the ward.

THANK-YOU

PLEASE ATTACH ADDRESS LABEL HERE

DATE OF DELIVERY: / /199

DATE QUESTIONNAIRE COMPLETED? / /199

INTENDED DATE OF DISCHARGE: / /199

DISCHARGE ADDRESS, IF DIFFERENT FROM ABOVE:

REFERENCE NUMBER E

PLEASE CIRCLE YOUR CHOICE OF ANSWER:

1. **How are you feeding your baby <u>now</u>?** (Please circle <u>one</u> response)

1. Breastfeeding
2. Bottle-feeding
3. Both bottle and breastfeeding
4. Other (Please explain).....

---

2. Why do you think you chose this method? (Please circle <u>any</u> of the following)

1. Previous experience
2. Better for my baby
3. Easier/convenient
4. Difficult to feed in public
5. Influence of family/friends
6. Influence of medical staff
7. Influence of Helper
8. Wanted to try
9. Better for myself
10. Didn't really think about it
11. Family can help
12. Cheaper
13. Other (Please explain)
... ...
... ...
... ...

---

3. Did you discuss infant feeding with anyone? Yes / No

3b. If yes, please circle <u>all</u> of those with whom you discussed feeding:

1. Partner/husband
2. Mother
3. Other relative
4. Friend
5. Midwife
6. Breastfeeding Helper
7. Clinic/ward staff
8. Other (Please explain)
.....

4a. Have you had any problems feeding your baby? Yes / No

4b. <u>If yes</u>, which of the following did you have? (Please circle <u>any</u>)

1. Baby not taking feed
2. Frequent Feeds/Hungry
3. Feeding painful
4. Baby unsettled
5. Not enough milk
6. Vomiting
7. Baby losing weight
8. You were tired
9. Baby in Special Care Nursery
10. Other (Please explain)
... ...

4c. <u>If you had problems</u>, who has helped you? (Please circle <u>any</u> of the following)

1. Partner/husband
2. Own mother
3. Friends
4. Ward/medical staff
5. Other mothers in ward
6. Breastfeeding Helper
7. No help required
8. No help offered
9. Other (Please explain)
... ...

ABOUT YOURSELF:

5. What type of delivery did you have? (Please circle **any**)

1. Normal
2. Forceps/Ventouse/Breech
3. Caesarean Section
4. Twins/Triplets

6. Was your baby born before 36 weeks? Yes / No

7. What was your baby's weight? (Write weight in box) [ ]

8a. Did your baby go to the Special Care Nursery? Yes / No

8b. If yes, approximately how long was he/she there? (Please circle **one**)

1. Up to 1 hour
2. Up to 6 hours
3. Up to 12 hours
4. Up to one day
5. Up to 2 days
6. More than 2 days

9. Do you live with any of the following? (Please circle **any**):

1. Partner/husband
2. Own children
3. Own parents
4. Partner's parents
5. Other relatives
6. Other (Please explain): .....

10a. Do you have enough support looking after your baby? Yes / No

10b. If no, what support would you like? (Please circle **any** of the following)

1. More help in general
2. More help with feeding
3. More help at night
4. More information on baby care
5. Opportunity to meet other mothers
6. More time in hospital
7. More support from Breastfeeding Helpers
8. Other (Please explain): .....
.....

11. Which of the following did you attend before having your baby? (Please circle **any**)

1. Breastfeeding workshop in the hospital (Bloomsbury)
2. Antenatal classes in the hospital
3. Antenatal classes in the community
4. A breastfeeding support group
5. Other: (Please explain) .....
.....

12a. Were you visited by a Breastfeeding Helper before you had your baby? Yes / No

12b. If you were visited by a Breastfeeding Helper, please answer the following 4 questions:

a) I had already decided on feeding method before I met the Helper. Yes / No

b) I decided to breastfeed because of the information she gave me. Yes / No

c) The information the Helper gave me was useful. Yes / No

d) I enjoyed being visited by a Helper. Yes / No

12c. Any Comments:

IF YOU HAVE <u>NEVER</u> BREAST-FED YOUR BABY, PLEASE FINISH HERE AND RETURN THIS QUESTIONNAIRE TO YOUR MIDWIFE IN THE WARD

THANK-YOU FOR YOUR HELP

IF YOU <u>ARE</u> BREASTFEEDING YOUR BABY OR IF YOU <u>STARTED</u> BREASTFEEDING YOUR BABY PLEASE CONTINUE WITH THIS QUESTIONNAIRE.

THANK-YOU

PLEASE COMPLETE IF YOU ARE BREASTFEEDING OR HAVE ATTEMPTED TO BREASTFEED YOUR BABY.

13a. Have you received any help with breastfeeding? Yes / No

13b. If yes, who has been helpful? (Please circle any of the following)

1. Partner/Husband
2. Own Mother
3. Friends
4. Midwives
5. Other mothers in ward
6. Breastfeeding Helper
7. Other ward staff
8. Other (Please explain)
   .....

---

14. For how long do you/did you plan to breastfeed?
(Please circle one of the following)

1. Up to 1 week
2. Up to 2 weeks
3. Up to 6 weeks
4. Up to 2 months
5. Up to 6 months
6. Up to 1 year
7. Over 1 year
8. Undecided

15a. Have you ever offered your baby a bottle? Yes / No

15b. If yes, what were your reasons for offering your baby a bottle?
(Please circle any of the following)

1. Baby was unsettled
2. Baby was ill / in Special Care Nursery
3. Baby was losing weight
4. Baby refused to feed
5. Not enough milk
6. You were tired
7. Breastfeeding was painful
8. Advised to by ward/medical staff
9. Other (Please explain)
   .....

15c. If you are breastfeeding and have also given your baby a bottle; for how long did you solely breastfeed? (Please circle one of the following)

1. Less than 5 feeds
2. About 6-12 feeds
3. More than 12 feeds

---

16. If you started breastfeeding, but have now stopped, what do you think caused you to stop? (Please circle <u>any</u> of the following)

1. Baby was unsettled
2. Baby ill/in Special Care Nursery
3. Baby losing weight
4. Baby refused to feed
5. Not enough milk
6. You were tired
7. Breastfeeding painful
8. Advised to stop
9. Didn't enjoy breastfeeding
10. Other (Please explain)....

17a. Is there anything which might help you to continue breastfeeding for longer? Yes / No

17b If yes, please circle <u>any</u> of the following suggestions

1. More help with your baby
2. More help with feeding
3. Shown how to position baby
4. More information on feeding
5. Meeting other mothers
6. More rest
7. Longer in hospital
8. Less time in hospital
9. More support and encouragement
10. Other (Please explain)....

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE, PLEASE RETURN IT TO YOUR MIDWIFE IN THE WARD

For further information, please contact:

RHONA MCINNES
RESEARCH MIDWIFE
DEPARTMENT OF CHILD HEALTH
YORKHILL NHS TRUST HOSPITAL
G3 8SJ
041 201 0411

DRUMCHAPEL
POSTNATAL QUESTIONNAIRE 2

(To be completed at around 6 postnatal weeks)

This is the final questionnaire on feeding your baby. We would like to ask you a few more questions about how you have fed your baby, problems you may have had and help you might have received. As before, all information you give us will be treated in strict confidence. If you are willing to continue to help, please complete the questions below and return this form to your clinic staff.

THANK-YOU VERY MUCH FOR YOUR HELP

Name:

Address:

GP's Name and Address:

Today's date: / /199

Age of Baby (weeks):

Reference Number D

EASTERHOUSE
POSTNATAL QUESTIONNAIRE 2

(To be completed at around 6 postnatal weeks)

This is the final questionnaire on feeding your baby. We would like to ask you a few more questions about how you have fed your baby, problems you may have had and help you might have received. As before, all information you give us will be treated in strict confidence. If you are willing to continue to help, please complete the questions below and return this form to your Health Visitor.

THANK-YOU VERY MUCH FOR YOUR HELP

Name:

Address:

GP's Name and Address:

Today's date: / /199

Age of Baby (weeks):

Reference Number E

PLEASE CIRCLE YOUR CHOICE OF ANSWER:

Please circle

1. How are you feeding your baby <u>now</u>? (Please circle <u>one</u> response)

1. Breastfeeding
2. Bottle-feeding
3. Both bottle and breastfeeding (where bottle contains <u>formula milk</u>)
4. Both bottle and breastfeeding (where bottle contains <u>breastmilk</u>)
5. Other, please explain:.....

2a. Do you have enough help/support looking after your baby? **Yes / N**

2b. <u>If no</u>, what support would you like? (Please circle <u>any</u> of the following)

1. More help in general
2. More help with feeding
3. More help at night
4. More information on baby care
5. Opportunity to meet other mothers
6. More time in hospital
7. More support from Breastfeeding Helpers
8. Other, please explain:
.....
.....
.....
.....

3a. Have you had any problems feeding your baby? **Yes / N**

3b. <u>If yes</u>, which of the following did you have? (Please circle <u>any</u>)

1. Baby not taking feed
2. Frequent Feeds/Hungry
3. Feeding painful
4. Baby unsettled
5. Not enough milk
6. Vomiting
7. Baby losing weight
8. You were tired
9. Baby in Special Care Nursery
10. Other, please explain:...
.....
.....

3c. <u>If you had problems</u>, who has helped you? (Please circle <u>any</u> below)

1. Partner/husband
2. Own mother
3. Friends
4. Midwife
5. Health Visitor
6. GP
7. Breastfeeding Helper
8. No help required
9. No help offered
10. Other, please explain:...
.....
.....
.....

4a. How many days did you spend in hospital? ☐ Please write number of days in box

Please circle

Did you feel this was: (Please circle choice below)

4b 1. Too long? 2. Too short? 3. Just right? 4. Don't Know?

If you have <u>never</u> breastfed your baby, please finish here and return this questionnaire.

Thank-you for your help.

If you <u>are</u> breastfeeding or if you have <u>tried</u> to breastfeed your baby, please continue.

5a. Have you received any help with breastfeeding? Yes / N

5b. If yes, who has helped you? (Please circle <u>any</u> of the following)

1. Partner/Husband
2. Own Mother
3. Friends
4. Community Midwife
5. Health Visitor
6. GP
7. Breastfeeding Helper
8. Other, please explain

.....

.....

6. How long would you like to continue breastfeeding? (If you have stopped breastfeeding please indicate how long you had hoped to breastfeed): (Please circle <u>one</u> of the following)

1. Up to 6 weeks
2. Up to 2 months
3. Up to 6 months
4. Up to 1 year
5. Over 1 year
6. Undecided

Please circle

7. **Is there anything you can think of which might make breastfeeding easier or which could help you to breastfeed for longer?** (Please circle <u>any</u> of the suggestions below):

1. More help with your baby
2. More help with feeding
3. Shown how to position baby
4. More information on feeding
5. Meeting other mothers
6. More rest
7. Longer in hospital
8. Less time in hospital
9. More support and encouragement
10. Other, please explain:

.....

.....

If you have stopped breastfeeding , please go to Q9

8a. **Since you have been home, have you ever offered your baby a bottle?** Yes / No

If you have <u>never</u> offered your baby a bottle, please go to Q. 10

8b. **If you <u>have</u> offered a bottle, what were your reasons for this?** (Please circle <u>any</u> of the following)

1. Baby was unsettled
2. Baby was ill / in Special Care Nursery
3. Baby was losing weight
4. Baby refused to feed
5. Not enough milk
6. You were tired
7. Breastfeeding was painful
8. Advised to by community staff
9. Influenced by family/friends
10. Difficult to breastfeed in public
11. Other (Please explain).....

8c. **If you are breastfeeding and have also given your baby a bottle; for how long did you <u>solely</u> breastfeed?** (Please circle <u>one</u> of the following)

1. Less than 1 day
2. Up to 1 week
3. Up to 2 weeks
4. Up to 4 weeks
5. Up to 6 weeks

Please circle

If you are currently breastfeeding or both breast and bottle feeding, please go to Q. 10

9a. If you started breastfeeding, but have now stopped, what do you think caused you to stop? (Please circle <u>any</u> of the following)

1. Baby was unsettled
2. Baby ill/in Special Care Nursery
3. Baby losing weight
4. Baby refused to feed
5. Not enough milk
6. You were tired
7. Breastfeeding painful
8. Advised to stop
9. Didn't enjoy breastfeeding
10. Influenced by family/friends
11. Difficult to breastfeed in public
12. Other (Please explain).....

9b. For how long did you breastfeed?

1. Less than 1 day
2. Up to 1 week
3. Up to 2 weeks
4. Up to 4 weeks
5. Up to 6 weeks

9c. Is there anything which might have helped you to continue breastfeeding? **Yes / No**

9d. If yes, please circle <u>any</u> of the following suggestions

1. More help with your baby
2. More help with feeding
3. Shown how to position baby
4. More information on feeding
5. Meeting other mothers
6. More rest
7. Longer in hospital
8. Less time in hospital
9. More support and encouragement
10. Other (Please explain).....

10a. After you had had your baby, were you visited at home by a Breastfeeding Helper? **Yes / No**

10b. **If yes, which of the following statements do you agree with:** (Please circle your choice of answers, if you do not know, please leave blank)

1. Visits from the Helper were helpful and informative.	**Agree / Unsure / Disagree**
2. I was able to breastfeed successfully without help.	**Agree / Unsure / Disagree**
3. Being visited by a Helper helped me breastfeed for longer.	**Agree / Unsure / Disagree**
4. The visits from a Helper did not make any difference to how I fed my baby.	**Agree / Unsure / Disagree**
5. The information the Helper gave me was useful when I came to breast-feed my baby	**Agree / Unsure / Disagree**
6. Support from my Helper was useful when I had problems.	**Agree / Unsure / Disagree**

THANK-YOU FOR COMPLETING THIS QUESTIONNAIRE.

PLEASE RETURN IT TO YOUR HEALTH VISITOR.

For further information, please contact:
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