MIDDLESEX-LONDON HEALTH UNIT

Breastfeeding Duration Rates in Middlesex-London

LONDON, ONTARIO
September 1999

Middlesex-London Health Unit
50 King Street
London, Ontario
N6A 5L7

Cite reference as:
McHale, H. & Gutmanis, I., (1999). Breastfeeding Duration Rates in Middlesex London. London, Ontario: Middlesex-London Health Unit.

For further information please contact:
Heather McHale
Middlesex-London Health Unit
Phone: 519-663-5317 ext. 2480
Fax: 519-432-9430

Heather McHale, BASc, MA, Principal Investigator, Independent Consultant, formerly of Middlesex-London Health Unit (MLHU)
Iris Gutmanis, BSc, BSc (PT), MSc, PhD, Epidemiologist, MLHU

This research project was developed in consultation with:

Margaret LaSalle, RN, BScN, IBCLC, Public Health Nurse, MLHU
Mitzi Pohanka, RN, BScN, IBCLC, Public Health Nurse, MLHU
Margaret Duncan, RN, SCM, IBCLC, Lactation Consultant, London Health Sciences Centre
Penny Forret, RN, BScN, IBCLC, Lactation Consultant, St. Joseph's Health Centre
Christian de Keresztes, PhD, CPsych, Queen's Health Research Policy Unit, Kingston, ON formerly of MLHU
Ursula Donovan, BASc, PhD, formerly of MLHU
Sandra Mackenzie, MScN, Public Health Nursing Manager, MLHU

Acknowledgements

There are many people who provided assistance with this study.

We wish to thank:

- Nancy Forbes and Lillian DeLellis for their administrative assistance with this report.
- Cathy Thomson and Heather Thomas for assistance with editing.
- Yvonne Tyml for library support from the Middlesex-London Health Unit.
- The Telephone Survey Unit of the Department of Epidemiology and Biostatistics of The University of Western Ontario for conducting the interviews.
- Ronnie Dubber and Angel Reil for assisting with the initial start-up phases of the study.
- Lynn Rempel for consultation during the development of the questionnaire
- All of the women who were study participants.

Funding for this study was provided by the Middlesex-London Breastfeeding Committee and the Public Health Research, Education and Development (PHRED) Program of the Middlesex-London Health Unit.

Table of Contents

List of Tables

List of Figures

Executive Summary

Introduction

Breastmilk is the optimum choice for infant feeding. Breastfeeding offers nutritional, immunological, psychological and economic benefits. One of the objectives of the Ontario Ministry of Health's Mandatory Health Programs and Services Guidelines (1997) is "to increase to 50% the percentage of infants breastfed up to six months by the year 2010". In order to see how close Middlesex-London residents were to this provincial objective, the Middlesex-London Health Unit, in collaboration with St. Joseph's Health Centre and the London Health Sciences Centre, surveyed women with infants aged six to 10 months. Funding for this research study was obtained through the Middlesex-London Breastfeeding Committee and the Public Health Research, Education and Development (PHRED) Program of the Middlesex-London Health Unit.

Study Objectives

1. To determine the rates of initiation and duration of breastfeeding in Middlesex-London among mothers who gave birth in London or Strathroy in 1998.
2. To obtain baseline data against which future rates can be compared in order to assess changes in infant feeding practices.
3. To identify barriers to and supports for breastfeeding.
4. To provide data for planning interventions to support and encourage breastfeeding initiation and maintenance for at least six months.

Study Design

Women in London and Middlesex County who had given birth in 1998 and whose babies were at least six months old were asked to complete a 15-minute telephone interview. Of the 587 women who were contacted, 535 (91%) participated. Mothers were asked:

- what decisions they had made during pregnancy in terms of how and what they had planned to feed their infant,
- how and what they fed their baby while in hospital,
- if applicable, why they chose not to breastfeed,
- if they had recalled any contact with a public health nurse,
- to identify any infant feeding concerns/problems, when they occurred, and if assistance was required,
- if applicable, reasons why breastfeeding was discontinued, and
- how and what they were currently feeding their baby.

Study Results

Of the 535 women interviewed, 88% initiated breastfeeding. Of the 471 women who initiated breastfeeding, 61.8% breastfed to four months, and 53.7% breastfed for six months or more. Among women who chose to breastfeed, 51.6% exclusively[1] breastfed until the infant was at least four months of age.

The most common reasons given for not initiating breastfeeding were personal choice, a negative past breastfeeding experience and maternal physical health problems. Reasons for discontinuing breastfeeding most commonly included returning to work or school and perception of insufficient milk supply.

Following discharge from hospital, 53.6% of the women recalled contact with a public health nurse. Of the 286 women who recalled being contacted by a public health nurse, 61.2% were primiparous and 38.8% were multiparous.

Only 26% of survey participants reported having *no* infant feeding concerns or problems. Of those who did have concerns or problems with feeding their babies, 70% received help, most frequently from their family doctor or from a public health nurse.

The majority of mothers waited the recommended time period of four to six months to introduce other fluids or solids to their infants. However, 23% of survey mothers who had introduced infant cereal or pablum did so before the recommended time of four months. As well, of the mothers who had introduced cow's milk to their infants, 81% introduced it before the minimum recommended time of nine months.

Recommendations

Based on a literature review and the current study findings, a number of recommendations are offered for implementation. The recommendations pertain to four broad health categories, awareness, barriers, education and support, and are summarized as follows:

[1] In this study, women were categorized as exclusively breastfeeding if only breastmilk and water were given to the infant.

It is recommended that:

- Middlesex-London be promoted as a breastfeeding-friendly community,
- health care providers with the most current breastfeeding knowledge continue to educate women, their families and friends, as well as the entire community about the benefits and challenges of breastfeeding,
- the Middlesex-London community work together to remove barriers that undermine initiation and continuation of breastfeeding,
- health care providers continue to use a team approach to attend to maternal and child needs and promote optimal infant nutrition and family health, and
- the Middlesex-London Health Unit work in conjunction with all health care providers to provide a variety of readily accessible supports to women who have just given birth.

Introduction

Breastmilk is the optimum choice for infant feeding. The Canadian Paediatric Society, Dietitians of Canada, and Health Canada (1998) recommend exclusive breastfeeding for at least the first four months of life. Despite recent increases in breastfeeding initiation and duration rates (Williams, Innis, Vogel & Stephen, 1999), infant feeding remains an important health issue. One of the objectives of the Ontario Ministry of Health's Mandatory Health Programs and Services Guidelines (1997) is "to increase to 50 percent the percentage of infants breastfed up to six months by the year 2010".

Recently Health Canada (1999) published results from two national surveys conducted in 1994/95 (the National Population Health Survey (NPHS) and the National Longitudinal Survey of Children and Youth (NLSCY)). Breastfeeding initiation rates for Ontario were reported by the NLSCY as 80%, and 78% by NPHS. NLSCY reported that 22% of women breastfed for *more than six* months, and NPHS reported that 33% of women breastfed for *more than six* months. The most recent local information comes from the 1990 Ontario Health Survey. At that time 73% of women in Middlesex-London initiated breastfeeding. Of the women who initiated breastfeeding, 51.3% breastfed for *four* months or more.

In order to see how close Middlesex-London residents were to the provincial objective set by the Ontario Ministry of Health's Mandatory Health Programs and Services Guidelines, it was necessary to obtain recent local data about breastfeeding initiation and duration.

Factors Associated with Infant Feeding Practices

Introduction

In recent years, many studies have examined factors associated with infant feeding decisions. The evidence suggests that different factors are involved at different times. A literature review of prenatal, perinatal and postnatal factors was conducted and is summarized below.

Prenatal Factors

Infant feeding decisions are typically made either before or during early pregnancy (Losch, Dungy, Russell, & Dusdieker, 1995). Not only do women tend to make infant feeding decisions prior to conception, but women tend to do what they planned to do. Lawson & Tulloch (1995) and Matthews, Webber, McKim, Banoub-Baddour, & Laryea, (1998) found a strong association between prenatal infant feeding intentions and the actual feeding choices. Further, evidence suggests that the earlier a woman decides to breastfeed, the longer she is likely to breastfeed (Losch et al., 1995). Thus, early education about the benefits of breastfeeding may increase both initiation and duration rates.

Perinatal Factors

Hospital practices have been linked with breastfeeding initiation and duration rates. One review concluded that both early contact between mother and infant, and assistance with breastfeeding increased duration (Bernard-Bonnin, Statchenko, Girard, & Rousseau, 1989). Another study reported that mothers who had a positive experience with breastfeeding in the maternity ward coped better with breastfeeding than mothers whose experience was less positive (Tarkka, Paunonen, & Laippala, 1998).

Perinatal infant feeding choices are a function of sociodemographic factors. Matich & Sims, (1992) and Matthews et al., (1998) found that maternal age, income, and education were strong predictors of breastfeeding initiation and duration.

Postnatal Factors

Reasons for discontinuing breastfeeding vary over time. The decision to discontinue breastfeeding within the first month is often based on maternal physical health problems (Matthews et al., 1998; Bourgoin et al., 1996). Between six weeks and four months after the birth of the baby the most frequently cited reason for discontinuing breastfeeding is the mother's perception that she does not have enough milk (Hill, 1991; Bourgoin et al., 1996; Matthews et al., 1998).

Occupational status appears to be an important influence on breastfeeding duration. Mothers who return to full-time work outside the home are more likely to discontinue breastfeeding five to six months postnatally as compared to mothers who do not work outside the home (Ryan & Martinez, 1989, Bourgoin et al., 1995).

Social supports and personal networks can influence breastfeeding decisions. Partners, siblings, parents, friends, and co-workers can provide tangible, informational and emotional support to breastfeeding women (Losch et al., 1995; Tarkka et al., 1998).

Study Methods

Introduction

Health care providers from the Middlesex-London Health Unit, the London Health Sciences Centre and St. Joseph's Health Centre meet regularly to discuss issues relating to optimal maternal and infant health. During one of these discussions it became clear that recent local information on breastfeeding initiation and duration rates, as well as factors that may influence infant feeding decisions, were lacking. Because such information is invaluable for program planning both in the hospital and the community, individuals from these institutions decided to develop and conduct a study on infant feeding practices.

Study Objectives

1. To determine the rates of initiation and duration of breastfeeding in Middlesex-London among mothers who gave birth in London or Strathroy in 1998.
2. To obtain baseline data against which future rates can be compared in order to assess changes in infant feeding practices.
3. To identify barriers to and supports for breastfeeding.
4. To provide data for planning interventions to support and encourage breastfeeding initiation and maintenance for at least six months.

Eligibility Criteria

Inclusion Criteria

Study participants were women aged 18 or more, who had given birth in hospitals in London or Strathroy, between February 1 and May 15, 1998, and who lived in London and Middlesex County. Both primiparous and multiparous women were eligible.

Exclusion Criteria

Mothers who had had previous breast surgery, were known to be HIV-positive, or who spoke little or no English were excluded. In addition, mothers of infants who weighed less than 2500 grams, were less than 37 weeks gestation, or had a serious congenital anomaly (e.g., Pierre Robin Syndrome, Down's Syndrome, a cardiac anomaly that required corrective surgery or a cleft palate or lip) were excluded.

Public health nurses from Middlesex-London Health Unit routinely screen and collect the name, phone number and address of all women who have just given birth. This data was used to identify eligible women for this study. Of the 1,171 births that occurred between February 1 and May 15, 1998, 112 were not eligible for the study for the following reasons:

- 46 babies weighed less than 2500 gm (5lb 8oz)
- 56 babies were born before 37 weeks gestation
- 2 babies had serious congenital defects e.g., cleft palate
- 4 mothers had previous breast surgery
- 9 mothers spoke little or no English
- 4 babies were placed for adoption
- 16 mothers were less than 18 years of age
- 15 mothers had no telephone number
- 3 mothers experienced perinatal loss or stillbirth

The total number does not add up to 112, because some mothers or infants may have been ineligible for the study for more than one reason.

Sample Size

Sample size calculations showed that a minimum of 460 women would have to be telephoned to ensure that the maximum discrepancy between sample estimates and true population values was 5% (assuming a nonparticipation rate of 20%).

Study Design

Since 1997, staff from the Middlesex-London Health Unit, the London Health Sciences Centre and St. Joseph's Health Centre have met regularly to discuss the study design. The study questionnaire was developed after examining the questionnaires used in other investigations of breastfeeding initiation and duration rates (see Appendix A).

During the interview, mothers were asked:

- what decisions they had made during pregnancy in terms of how and what they had planned to feed their infant,
- how and what they fed their baby while in hospital,
- if applicable, why they chose not to breastfeed,
- if they recalled any contact with a public health nurse,

- to identify any infant feeding concerns/problems, when they occurred, and if assistance was required
- if applicable, reasons why breastfeeding was discontinued, and
- how and what they were currently feeding their baby.

Although mailed questionnaires are less costly than telephone interviews, the data were gathered by telephone because of the complex skip patterns in the questionnaire and the higher response rate associated with telephone surveys (Siemiatycki, 1979). The study was approved by the Review Board for Health Sciences Research Involving Human Subjects at The University of Western Ontario, London, Canada and by the Research Advisory Committee at the Middlesex-London Health Unit.

Of the 1,059 women who met eligibility criteria, 1,000 names were randomly selected. A letter describing the purpose of the study was sent to potential participants in November 1998 (see Appendix B for the Letter of Introduction). Between November 25th and December 19th, 1998, women who were sent an initial letter were randomly selected from the list and phoned by the Telephone Survey Unit of the Department of Epidemiology and Biostatistics of The University of Western Ontario. Individuals were called up to four times before their name was removed from the list. Participation within the 15-minute interview was voluntary, and confidentiality was ensured.

Statistical Analyses

Data were analyzed using the SPSS/PC statistical software, Version 8.5. Initially, the number of times each response category was selected was determined for each question. Next, response frequencies were calculated based on breastfeeding duration, again for each question.

For this study, breastfeeding duration was divided into six categories. As stated previously, one of the objectives of the Ontario Ministry of Health's Mandatory Health Programs and Services Guidelines (1997) is "to increase to 50 percent the percentage of infants breastfed up to six months by the year 2010". Thus, one of

the categories selected for this study was breastfed for six months or more[2]. Another fairly self-evident category was never breastfed. The other four categories were based on the time periods in which infant growth spurts generally occur, placing greater demand on the breastfeeding mother's milk supply. These categories included women who:

- breastfed for two weeks or less,
- breastfed more than two weeks up to and including six weeks,
- breastfed more than six weeks up to and including three months, and
- breastfed more than three months but less than six months.

Finally, cross-tabulations were done by factors thought to significantly affect the initiation and duration of breastfeeding, such as education and parity.

All of the frequencies reported in this document are estimates of true population values because only a sample of all of the women who had given birth in 1998, lived in the City of London or Middlesex County, and who gave birth in hospital were interviewed. Ninety-five percent confidence intervals were calculated for each estimate to provide the range within which the true value was likely to lie 95 times out of 100. Further, statistical tests were done at a 5% level of significance. This means that only five times out of 100 would any group differences labeled as statistically significant in this report be, in fact, due to chance or sampling variation.

[2] The category for those who breastfed for six months or more was not subdivided any further because some women were still breastfeeding. Thus, it was not possible to determine their total duration beyond six months.

Study Results

Study Participation

Of the 1,000 telephone numbers provided to the Telephone Survey Unit, 226 were deemed ineligible for the following reasons: the number was not in service, the provided telephone number was incorrect, the person had moved, or the provided number was a business or fax number. Therefore, 774 of the telephone numbers remained eligible. Thirty-three women were deemed ineligible for the following reasons: the women did not speak English, the mother either was not available or was ill, the baby had died or there had been a death in the family. Of the remaining 741 telephone numbers, 154 were called four times with no contact, and 52 mothers refused to participate in the study. Thus, of the total 587 eligible mothers reached, 535 or 91% agreed to participate.

Participant Profile

Five hundred and thirty-five women were interviewed. As seen in Table 1, more than 40% of the study participants were aged 30-34, and almost 30% were aged 25-29. Almost 13% were less than 25 years of age, while 15.7% were 35 or more years of age. The age distribution of survey respondents was then compared to that of all women who in 1996 had given birth in Middlesex-London. This comparison suggests that women 29 years of age and under may be under-represented in the study, while women 30 years of age and over may be over-represented.

More than half of the study participants had completed college or university and a further 6.7% had post-graduate education. When compared to 1996 census results for Middlesex-London residents aged 15 or more, the present study sample may over-represent those with higher levels of education. However, the available census figures were for *all* individuals aged 15 or more (men and women). Women aged 18-49, that is, those involved with the present survey are likely to have achieved a higher level education than women aged 50 or more. So, it is unknown if the sample reflects the educational attainment of women who have recently given birth and who live in the City of London or Middlesex County.

Generally speaking, for survey respondents the total family income was divided equally into three groups. Thirty-three percent had a total family income for 1997 below $40,000, 30.7% had a family income of $40,000 to less than $60,000, and 36.5% had a family income greater than $60,000. Survey respondents' family

income tended to cluster more in the middle income categories ($20,000 - $59,999) than Middlesex-London family income, as determined during the 1996 census.

Table 1: Comparison of Study Participants with Population Figures

Age Groupings	*Number*	*Percent*	*Census or Live Birth Data*
18 & 19	6	1.1%	3.8%
20-24	63	11.8%	16.1%
25-29	160	29.9%	32.3%
30-34	222	41.5%	34.1%
35-39	74	13.8%	11.9%
40-44	9	1.7%	1.7%
45-49	1	0.2%	0.0%
Highest level of education completed			
Did not complete high-school	21	3.9%	29.7%
Completed high-school	116	21.7%	15.3%
Some college/university	55	10.3%	39.1%
Completed college/university	307	57.4%	15.9%$^{\Omega}$
Post graduate	36	6.7%	
*Total family income for 1997**			
<$20,000	47	9.7%	12.8%
$20,000 to $39,999	112	23.1%	23.1%
$40,000 to $59,999	149	30.7%	24.1%
≥$60,000	177	36.5%	39.9%
Parity^			
First child	189	35.5%	41.3%
More than 1 child	344	64.5%	58.7%

Note: $^{\Omega}$ Includes both categories of some college/university and completed college/university; * 30 of the study participants did not answer this question and 20 did not know; ^ 2 of the study participants did not respond.

Data Sources: 1996 census figures were used to generate Middlesex-London total family income and education figures. The Ontario Live Birth Database, Ontario Ministry of Health, 1996 was used to generate Middlesex-London comparitors for parity and maternal age.

For just over a third of the survey participants, this was their first baby. However, the 1996 Live Birth Data figures for Middlesex-London suggest that a higher proportion (41.3%) of women who gave birth and who lived in the City of London or Middlesex County were primiparous. Thus, primiparous women in the current study may have been under-sampled.

Breastfeeding Duration

Of the 535 women interviewed, 88% (n=471) initiated breastfeeding. Of the 471 women who initiated breastfeeding, 53.7% (n=253) breastfed for six months or more (see Table 2).

Table 2: Breastfeeding Duration

LENGTH OF TIME BABY WAS BREASTFED								
Never	< 1 wk	1 wk to < 1 mo	1 to < 2 mos	2 to < 3 mos	3 to < 4 mos	4 to < 5 mos	5 to < 6 mos	6 mos & up
n=535	n=471							
12.0% (64)	3.4% (16)	7.4% (35)	6.8% (32)	5.7% (27)	6.4% (30)	7.9% (37)	10.0% (41)	53.7% (253)

Note: The number in brackets is the actual number of mothers who breastfed for that duration.

Breastfeeding Duration Categories

Table 3 shows the number of women in each of the six breastfeeding duration categories that were used for additional analyses.

Table 3: The Number of Women by Breastfeeding Duration Category

Category	*Number of Women*
Never Breastfed	64
Breastfed 2 weeks or less	42
Breastfed more than 2 weeks up to and including 6 weeks	36
Breastfed more than 6 weeks up to and including 3 months	54
Breastfed more than 3 months but less than 6 months	86
Breastfed 6 months or more	253

Past Breastfeeding Experience

Three hundred and forty-four women indicated that they had had other children. Of the 344 multiparous women, 84.6% (n=291) reported breastfeeding their other child(ren). When asked to rate their level of satisfaction with their previous breastfeeding experience, significant differences ($p<0.001$) were found between those who, in the present study, never breastfed and women in the all of the other breastfeeding duration categories. Those with a positive previous breastfeeding experience were more likely to initiate breastfeeding and breastfeed for a longer period of time (see Table 4).

Table 4: Satisfaction with Past Breastfeeding Experience

CURRENT STATUS	AVERAGE SCORE FOR SATISFACTION 1 (very unsatisfied) to 5 (very satisfied)
Never Breastfed (n=17)	1.88 (1.23 – 2.53)
Breastfed ≤ 2 weeks (n=16)	3.13 (2.33 – 3.92)
Breastfed >2 weeks - 6 weeks (n=18)	3.78 (2.97 – 4.59)
Breastfed >6 weeks - 3 months (n=31)	3.45 (2.82 – 4.08)
Breastfed >3 - < 6 months (n=58)	3.97 (3.64 – 4.29)
Breastfed ≥ 6 months (n=151)	4.23 (4.03 – 4.43)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Prenatal Experience

Just over half (57.9%) of the women thought about how they were going to feed their baby prior to conception, 37% made the decision during their pregnancy, 4.9% decided after the baby was born, and one person didn't know when she decided. Those who breastfed for six weeks or more were more likely to have made the decision to breastfeed before their pregnancy than either those who breastfed less than six weeks or those who never breastfed (see Table 5).

Table 5: Timing of Breastfeeding Decisions by Breastfeeding Duration Category

	WHEN DID YOU FIRST THINK ABOUT HOW YOU WOULD FEED YOUR BABY?				
Category	Before pregnancy	During pregnancy	After birth	Don't know	Total
Never Breastfed	42.2% (27)	46.9% (30)	10.9% (7)	0	100% (64)
Breastfed ≤ 2 wks	47.6% (20)	40.5% (17)	11.9% (5)	0	100% (42)
Breastfed >2 wks - 6 wks	38.9% (14)	58.3% (21)	2.8% (1)	0	100% (36)
Breastfed >6 wks - 3 mos	61.1% (33)	37.0% (20)	1.9% (1)	0	100% (54)
Breastfed >3 - < 6 mos	62.8% (54)	36.0% (31)	1.2% (1)	0	100% (86)
Breastfed ≥ 6 mos	64.0% (162)	31.2% (79)	4.3% (11)	0.4% (1)	100% (253)
All Categories Combined	57.9% (310)	37.0% (198)	4.9% (26)	0.2% (1)	100% (535)

Note: The number in brackets in the number of women in this category.

Women generally followed through with their thoughts on what they would feed their baby. For example, almost 100% of those who breastfed for more than two weeks had planned to breastfeed and 85.9% of those who never breastfed had planned to formula feed. Only a small number of women who planned to breastfeed either didn't breastfeed at all or only did so for a short time. Interestingly, results suggest that when women are making these feeding decisions, they rarely consider the combination of breastmilk and formula (see Table 6).

Table 6: Planned Infant Feeding by Breastfeeding Duration Category

	HOW DID YOU **PLAN** TO FEED YOUR BABY IN THE FIRST FEW WEEKS AFTER BIRTH?				
Category	Breastmilk only	Formula only	Breastmilk & Formula	Don't Know	Total
Never Breastfed	10.9% (7)	85.9% (55)	1.6% (1)	1.6% (1)	100% (64)
Breastfed ≤ 2 wks	85.7% (36)	11.9% (5)	2.4% (1)	0	100% (42)
Breastfed >2 wks - 6 wks	97.2% (35)	2.8% (1)	0	0	100% (36)
Breastfed >6 wks - 3 mos	98.1% (53)	0	1.9% (1)	0	100% (54)
Breastfed >3 - < 6 mos	100% (86)	0	0	0	100% (86)
Breastfed ≥ 6 mos	99.2% (251)	0	0.4% (1)	0.4% (2)	100% (253)
All Categories Combined	87.5% (468)	11.4% (61)	0.7% (4)	0.4% (2)	100% (535)

Note: The number in brackets in the number of women in this category.

When asked, "Who helped with the decision about how the baby would be fed?", most women (414 or 77.4%) indicated that they had decided on their own. Thirty-two percent of women (n=172) indicated that their partner was also instrumental in

the decision. Other responses included mother (35 or 6.5%), and doctor (30 or 5.6%). Because respondents could provide more than one response, the percentages do not total 100.

During their pregnancy, women received breastfeeding information from a variety of sources. The most commonly identified sources of information were books (178 or 33.3%), prenatal classes (157 or 29.3%), and doctor or midwife (102 or 19.1%). However 21.3% of the women (n=114) did not receive any breastfeeding information during their pregnancy. Further analyses indicated that slightly more women who never breastfed also reported not receiving any breastfeeding information. However, this difference was not statistically significant. In addition, women who did not plan to breastfeed may not have sought information on breastfeeding.

Following the birth of the baby, 49.2% (n=263) of women stayed in hospital 24 to 48 hours, 35.5% (n=190) remained in hospital more than 48 hours, while only 15.5% (n=82) remained in hospital less than 24 hours. While in the hospital 65.2% (n=349) of the babies were fed breastmilk, 22.8% (n=122) were fed a combination of breastmilk and formula, and 12.0% (n=64) were fed only formula. Breastfeeding duration was not significantly associated with the length of stay in the hospital.

Six (1.1%) babies remained in hospital after their mothers were discharged. The babies who remained in hospital stayed between two and ten days. Two (33.3%) of the babies that remained in the hospital were never breastfed.

Perinatal Experience: While in the Hospital

Babies Who Were Fed Breastmilk in the Hospital

While in the hospital, 88.0% of the babies (n=471) were given breastmilk. Breastmilk was given to the baby by breast in 96.4% (n=451) of the cases. Other methods included breastmilk through a cup (n=24), a bottle (n=20), a lactation aid (n=4), and finger method (n=3). Some women may have used a combination of these methods.

The majority of the babies (323 or 69.2%) were breastfed less than one hour after birth. Of the 148 babies who were not breastfed within the first hour after birth, 23.2% (n=33) were given other fluids, and 13 women did not know if their babies had been given other fluids. Of the 33 babies given other fluids, 20 were fed

formula, 10 were fed glucose water, two were fed expressed breastmilk or colostrum, three were given water, and two received fluids intravenously (some babies may have been given more than one other fluid). Although the majority of infants initiated breastfeeding within one hour after birth, there was a statistically significant association between breastfeeding duration and time between birth and initial breastfeeding ($p<0.01$). Women who breastfed for two weeks or less were more likely to have waited longer to initiate breastfeeding than women who breastfed for six months or longer.

When asked how long they intended to breastfeed, most women (339 or 72.6%) responded in terms of months. Other responses included "as long as the baby wants" (21 or 4.5%), "as long as I could" (96 or 20.5%), "don't know" (4 or .9%), and "don't plan to continue or stopped before leaving the hospital" (8 or 1.7%). There were three missing responses (see Table 7).

Table 7: Number of Months Mother Planned to Breastfeed vs. Actual Breastfeeding Duration

	PLANNED	ACTUAL		
Number of months		LESS THAN PLANNED	SAME AS PLANNED	MORE THAN PLANNED
1 mo – 6 wks	7	2	1 (16.7%)	4
2 mos – 3 mos	35	10	13 (37.1%)	12
3.5 mos – 5.5 mos	64	21	31 (48.4%)	12
6 mos and over	234	76	158 (67.5%)	-

Further, there was a significant association between planned breastfeeding duration and actual duration ($p<0.001$). It is interesting to note that as the average length of time women *planned* to breastfeed increased so did *actual* breastfeeding duration. In other words, on average, women who breastfed for six months or more had planned to do so (see Table 8).

Table 8: Average Number of Months Planned to Breastfeed vs. Actual Months Breastfed

ACTUAL BREASTFEEDING DURATION	AVERAGE NUMBER OF MONTHS PLANNED
Breastfed ≤ 2 weeks	4.93 (4.18 – 5.69)
Breastfed >2 weeks - 6 weeks	5.38 (4.30 – 6.46)
Breastfed >6 weeks - 3 mos	4.91 (4.28 – 5.54)
Breastfed >3 - < 6 mos	5.38 (4.89 – 5.88)
Breastfed ≥ 6 mos	8.64 (8.08 – 9.20)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Women were asked whether or not they experienced breastfeeding difficulties while in the hospital. Forty percent of the women (n=187) indicated that they had experienced some difficulties with breastfeeding, while 60.0% (n=280) indicated that they had not experienced any breastfeeding difficulties. Four women did not answer the question. However, when a specific list of difficulties was presented to the women, only 35.5% (n=166) indicated having no breastfeeding problems while in hospital. This suggests that during the initial stages of breastfeeding some women may consider some "difficulties" as "normal".

Difficulty with latch, the most frequently mentioned breastfeeding problem, was indicated by 33.5% of the women (n=157). Also, breastfeeding duration was associated with establishing a latch while in hospital. Thus, it is not surprising that half of the women who breastfed for six weeks or less had problems establishing a latch while in the hospital. Thirty-seven percent of those who breastfed for more than six weeks to three months had problems with latching while in the hospital. Further, 32.1% of those that breastfed more than three months to less than six months had problems with latching while in the hospital, and only 27.7% of those that breastfed for six months or more had problems with latching while in the hospital (see Table 9 for the other breastfeeding problems).

Table 9: Frequency of Breastfeeding Problems While in the Hospital

Breastfeeding Problem	*Number of times mentioned*
Baby could not latch	157
Baby too sleepy to nurse	99
Mother had sore or cracked nipples	99
Mother did not have enough milk	74
Baby nursed too often	66
Mother did not have enough help with breastfeeding	47
Baby cried when put to breast	39
Mother had flat or inverted nipples	39
Mother was not well enough to breastfeed	29
Baby was not well enough to breastfeed	10
Other reasons	9
Mother found hospital practices inconsistent	7

Note: 468 women responded to the question. There were three missing responses. 166 women had no problems and 64 women elected to formula feed. Because more than one problem may have been mentioned, the numbers do not sum to 302.

The number of reported in-hospital breastfeeding problems was summed and the total score ranged from 0 (no problems) to 12. The results showed that women who breastfed for six weeks or less had significantly more problems (an average of 2.2 problems) while in the hospital than those who breastfed more than three months (an average of 1.3 problems) ($p<0.001$). Thus, in this study, the number of in-hospital breastfeeding problems was negatively associated with breastfeeding duration.

Forty-six percent of women who gave their babies breastmilk (214/465) indicated that they needed help with feeding their baby. A greater proportion of women who breastfed for six weeks or less (50/78 or 64%) reported needing help with breastfeeding than women who breastfed for more than six weeks (164/393 or 41.7%).

Of the 214 women who needed help with breastfeeding, most (136 or 63.6%) indicated that they received the amount of help they wanted, while 26.6% (n=57) of women got less help they wanted. A greater proportion of women who breastfed for two weeks or less (40.7%) reported getting less help than they wanted than women who breastfed longer (24.6%).

Thirty-nine percent of the babies bedded in, that is to say the baby lay with the mother in bed rather than in a bassinet in the mother's room or having baby returned to the nursery between feeds. Although the proportion of women who bedded in was highest in the group that breastfed for six months or more (45.1%), the association between bedding in and breastfeeding duration was not statistically significant.

Women Who Never Breastfed

Women who never breastfed their babies were asked why they decided to use formula. Sixty-three of 64 women provided their reason or reasons. Themes that commonly emerged were personal choice (25 or 39.7%), negative past breastfeeding experience (14 or 22.2%), and maternal physical health problems (8 or 12.7%).

Only six of the 64 women who formula fed indicated that they had needed help feeding their babies while in hospital. One woman indicated that she had received no help and another received more help than she had wanted. The remaining four women received the amount of help they had wanted. Sixteen women did not answer the question.

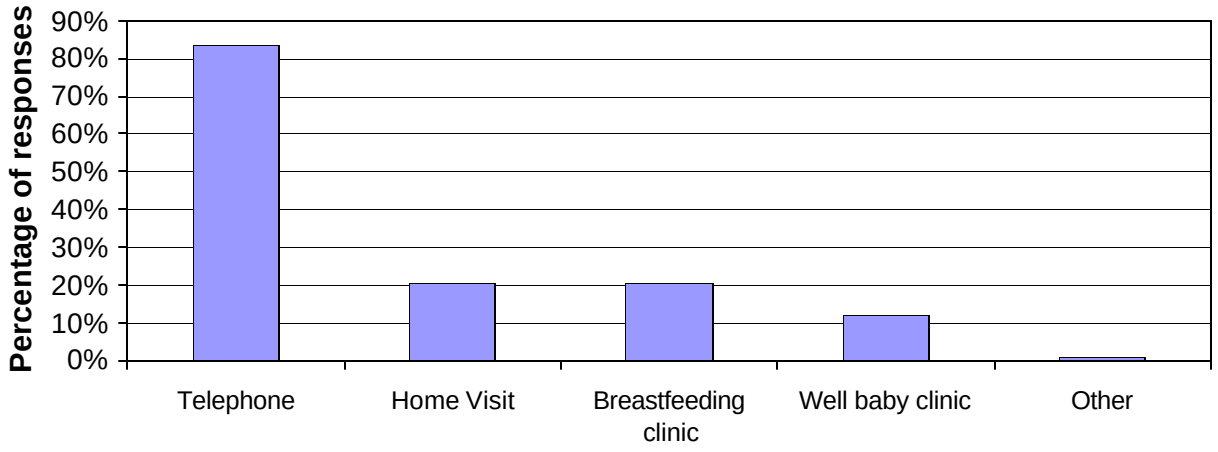
Postnatal Experience: Mother and Baby at Home

Following discharge from the hospital, 286 (53.6%) of the women recalled contact with a public health nurse. [3] Of these women, 175 (61.2%) were first time mothers. The most frequently mentioned method of contact was by telephone. Two hundred and thirty-nine women or 83.6% of those who were contacted by a public health nurse received a telephone call (see Figure 1).

Beginning October 1, 1999, *all* women will be contacted by a public health nurse within 48 hours of discharge from the hospital and offered a home visit. This change is a result of the provincial government's Healthy Babies/Healthy Children expansion of services to all postpartum women and their families.

[3] When asked "Have you had contact with a public health nurse since your baby was born", study participants may not have associated visits to a breastfeeding clinic or well baby clinic as contact with a public health nurse. Therefore, the reported number of contacts may be lower than the actual number of contacts.

Figure 1: Public Health Nurse Contact (n=286)



Note: More than one method of contact may have been indicated

Study respondents were read a list of potential infant feeding concerns or problems that they may have had since their hospital discharge. If the mother indicated a particular concern or problem, she was then asked how old the baby was when it began. Although some problems may have occurred more than once, only the initial occurrence was recorded. The 15 most frequently mentioned infant feeding concerns were:

- Mother had engorged breasts (191 or 35.7%)
- Mother had sore or cracked nipples (169 women or 31.6%)
- Baby gassy (121 or 22.6%)
- Baby frequently spits up (100 or 18.7%)
- Baby couldn't latch (95 or 16.5%)
- Mother had concerns about use of formula, type, amount (91 or 17.0%)
- Mother had overactive letdown (85 or 15.9%)
- Baby not settling or fussy after feeds (80 or 15.0%)
- Mother did not have enough milk (77 or 14.4%)
- Mother was concerned about when to introduce new foods (74 or 13.8%)
- Baby nursed too often (73 or 13.6%)
- Mother had a breast infection (65 or 12.1%)
- Baby crying or fussy when put to breast (55 or 10.3%)
- Baby too sleepy to nurse (50 or 9.3%)
- Baby not gaining adequate weight (41 or 7.7%)

Twenty-six percent (n=138) of the women surveyed reported no infant feeding problems. As seen in Table 10, a greater proportion of women who never breastfed reported no infant feeding problems than women who breastfed for six months or more (40.6% vs. 26.1%).

Table 10: Proportion of Women Who Had No Infant Feeding Concerns by Breastfeeding Duration Category

Breastfeeding Duration						
Never	≤ 2 wks	>2 wks - 6 wks	>6 wks - 3 mos	>3 mos - <6 mos	≥ 6 mos	Total
40.6% (26/64)	16.7% (7/42)	8.3% (3/36)	24.1% (23/54)	26.7% (23/86)	26.1% (66/253)	25.8% (138/535)

Note: The number in brackets is the actual number of mothers who indicated the problem over the total number of women in the breastfeeding duration category.

Tables 11a-11o show the number of women who had a specific problem by age of baby and by breastfeeding duration category. For example, Table 11a shows the number of women who had problems with latch. As expected, women who never breastfed noted no problem with latch. Fourteen of 42 women who breastfed experienced a problem with latching within the first two weeks and stopped breastfeeding during this time. For the 253 women who breastfed for more than six months, 37 had problems with latch. Of these 37 women, 34 noted the problem during the first month postpartum, one noted the problem at one month to six weeks postpartum, one noted the problem at six weeks to two months postpartum, and one noted this problem at three to four months postpartum. Overall, 95.5% of the women who indicated a problem with latch, noted this problem at less than one month postpartum.

For all of the problems, the frequency with which the problem was noted varied by breastfeeding duration category. In addition, the age of the baby at which the problem was noted varied by breastfeeding duration category. While some problems tended to begin during the first month (baby too sleepy to nurse, latch, sore/cracked nipples), other concerns tended to occur later on (mother had breast infection, concerns about formula type/amount, concerns about when to introduce new foods). Of the women who had a problem, the percent who had this problem at less than one month is shown below.

- Baby too sleepy to nurse (98.0%)
- Baby couldn't latch (95.5%)
- Mother had sore or cracked nipples (84.6%)

- Baby nursed too often (80.8%)
- Baby not settling or fussy after feeds (80.0%)
- Baby crying or fussy when put to breast (78.2%)
- Mother had overactive letdown (76.5%)
- Mother had engorged breasts (75.4%)
- Mother did not have enough milk (71.4%)
- Baby gassy (67.8%)
- Baby frequently spits up (67.0%)
- Baby not gaining adequate weight (61.0%)
- Mother had a breast infection (41.5%)
- Mother had concerns about use of formula, type, amount (29.7%)
- Mother was concerned about when to introduce new foods (2.7%)

Infants in this study ranged in age from six months to ten months, and the concerns or problems their mothers had about feeding could have occurred anytime prior to the survey. Of the 384 women who had **any** concerns or problems with feeding their babies, 69.3% received help (n=266). The most frequently mentioned source of help was their doctor or their doctor's nurse (68.8%), followed by a public health nurse (54.5%). The frequency with which other sources of help was used is shown in Table 12.

Table 12: Sources of Help with Infant Feeding Concerns

Source of help	*Number who indicated (n=266)*
Doctor/Doctor's nurse	183
Public Health Nurse	145
• Breastfeeding clinic (47) (this number may also include the breastfeeding clinic at Victoria Hospital Family Medical Centre)	
• Phone contact (35)	
• Home visit (21)	
• Well baby clinic (18)	
• Both home visit & phone contact (4)	
• Not indicated (2)	
• Just Beginnings Class (1)	
Friend	36
Mother	35
Sister	15
Other female relative	13
Partner	10
Written material/books/pamphlets	10
Lactation Consultant	6
Other (Daycare, Parent's relative, twin club)	5
Hospital	5
Formula/Baby Food Company	4
La Leche League	2
Midwife	1

Note: More than one source may have been mentioned

Formula Samples or Coupons

Formula companies frequently send out samples of their products or coupons to mothers of newborns. Survey respondents were asked about formula samples or coupons to see if they had an effect on breastfeeding practices.

The majority of survey participants (463 or 86.5%) received formula samples or coupons. When asked which brands of formula they received, the most commonly mentioned brands were Enfalac™ (256 or 55.3%), Similac™ (245 or 52.9%), and Carnation™ (165 or 35.6%). SMA™, Heinz™, Isomil™, Nursoy™, and Soya were also mentioned (40 or 8.6%). Twelve women did not know which brands they had received.

Eighty-two percent of the surveyed women received formula samples or coupons by mail. Other recalled sources included the hospital[4] (24.0%), stores (8.6%), magazines (11.7%), their doctor or obstetrician (7.6%), Welcome Wagon (3.7%), formula company seminars such Baby Steps (1.3%), as well as friends, relatives, and co-workers (3.2%).

Just over half (55.9%) of the women received the coupons or formula samples after the birth of their baby. Approximately 20% received coupons or formula during their pregnancy, while 22.9% received coupons or formula before and after the birth of their baby. Five women could not remember when they received formula or coupons.

On average, women received formula samples or coupons 7.7 weeks (95% C.I.: 6.92 – 8.47) after the birth of their baby. There was no statistically significant association between breastfeeding duration and when the formula samples or coupons were received.

Fifty-nine percent of those who received formula samples or coupons had used them by the time of the interview. Women who breastfed for six months or more were significantly more likely to have used the formula or coupons when their babies were at an older age than women who breastfed less than six months or never breastfed. As seen in Table 13, women who breastfed two weeks or less, used their coupons, on average, four weeks after the birth of their baby, while women who breastfed for six months or more used their coupons, on average, 21 weeks after the birth of their baby.

[4] Physicians may prescribe formula for babies at risk of developing low blood sugar or jaundice while in hospital as a precautionary measure.

Table 13: Age of Baby When Coupons Used

CATEGORIES	AVERAGE AGE OF BABY IN WEEKS
Never Breastfed	5.80 (3.46 – 8.15)
Breastfed ≤ 2 weeks	4.07 (0.89 – 7.25)
Breastfed >2 weeks - 6 weeks	4.78 (4.13 – 5.42)
Breastfed >6 weeks - 3 months	10.65 (8.55 – 12.75)
Breastfed >3 - < 6 months	15.67 (14.05 – 17.30)
Breastfed ≥ 6 months	20.77 (19.01 – 22.52)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Feelings Towards Breastfeeding

Of the 463 women who breastfed their babies and responded to this question, only 16% (n=74) had been encouraged to stop breastfeeding at some point. As seen in Table 14, the two groups that were most often encouraged to stop were those that breastfed two weeks or less and those who breastfed for six months or more.

Among the 40 women who breastfed two weeks or less, 17.5% (n=7) were encouraged to stop. Of the seven women encouraged to stop breastfeeding, 57.1% (n=4) indicated that their family doctor encouraged them to stop and four were encouraged to stop by their mother. Among the 251 women who breastfed for six months or more, 19.5% (n=49) were encouraged to stop. Friends, mothers and mothers-in-law were most likely to discourage breastfeeding.

Women were asked to indicate whether or not they felt uncomfortable breastfeeding in specific locations. More than half of the women who breastfed were uncomfortable breastfeeding in either restaurants or when using public transportation. However, less than one quarter of women were uncomfortable breastfeeding either in the presence of friends or in the presence of family, or in more private locations. Although there was no statistically significant association between breastfeeding duration and level of comfort in breastfeeding at various locations, women who breastfed for a shorter duration were slightly more uncomfortable breastfeeding in public locations (see Table 15). Other locations where women mentioned feeling uncomfortable breastfeeding included churches, in the presence of male family/friends, and anywhere in public.

Women who had breastfed or were still breastfeeding were asked to rate their satisfaction with their breastfeeding experience. Women who breastfed for six months or more were significantly more satisfied with their breastfeeding experience than women who breastfed for two weeks or less (4.8 vs. 2.1; $p<0.001$) (see Table 16). In addition, the scores increased steadily as breastfeeding duration increased.

Table 16: Breastfeeding Satisfaction by Breastfeeding Duration Category

CATEGORIES	AVERAGE SCORE FOR SATISFACTION 1 (very unsatisfied) to 5 (very satisfied)
Breastfed ≤ 2 weeks	2.10 (1.66 – 2.54)
Breastfed >2 weeks - 6 weeks	2.44 (1.92 – 2.97)
Breastfed >6 weeks - 3 months	3.33 (2.94 – 3.73)
Breastfed >3 - < 6 months	4.41 (4.23 – 4.58)
Breastfed ≥ 6 months	4.78 (4.72 – 4.85)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Reasons for Breastfeeding Cessation

Of the 535 survey respondents, 471 initiated breastfeeding. At the time of the survey, when babies were between six and 10 months old, 33.1% (n=156) of the breastfeeding women were still giving their babies some breastmilk and 66.9% (n=315) of women had stopped. Of the 315 women who had stopped giving their babies breastmilk, 25.1% (n=79) stopped because they had returned to work or school, and 19.7% (n=62) stopped because of insufficient milk. Other reasons are shown in Table 17.

Workplace or school support of breastfeeding mothers may have some affect on breastfeeding duration rates. Of the 79 who stopped because they had returned to work, 54.4% (n=43) indicated that their work place or school was *not* supportive of breastfeeding. One woman did not know if her workplace was supportive and five didn't answer the question. However, 38.0% (n=30) indicated that their work or school *was* supportive of breastfeeding.

Introduction of Other Fluids and Solids

Mothers were asked if they had introduced their babies to fluids or solids other than breastmilk and formula. If the food had been introduced, mothers were then asked, "At what age did you start giving your baby this food regularly?". In order to exclude “one time” introduction of new foods, “regularly” was defined as at least once every two days.

Fluids

Seventeen percent (n=94) of infants had been introduced to cow’s milk (see Table 17). The joint working group of the Canadian Paediatric Society, Dietitians of Canada, and Health Canada (1998) recommends that infants do not receive pasteurized whole milk until they are nine to 12 months of age. In this study 21.7% (n=112) of infants were at least nine months of age and 27.8% (n=31) of these infants had been introduced to cow’s milk. Of the total infants introduced to whole milk (n=94), 81% were introduced earlier than the recommended minimum age.

In order to meet an infants higher fat needs, 2% and 1 % milk are not recommended in the first two years, and skim milk is considered inappropriate until much later (Canadian Paediatric Society, 1998). In this study, 2.8% (n=15) of mothers had introduced their babies to 2% milk at an average of 6.9 months. One mother had introduced her baby to skim milk.

There was no significant association between age at which cow’s milk was introduced and the six study breastfeeding duration categories which included those who never breastfed.

Table 18: Introduction of Cow’s Milk

Type of Cow’s Milk	*Frequency*	*Percent*	*Average age in months when introduced*
Homogenized milk	78	14.6%	7.53 (7.11 – 8.20)
2% milk	15	2.8%	6.93 (6.05 – 7.80)
Skim milk	1	0.2%	9.00

Note: The number in the brackets is the 95% confidence interval associated with the point estimate.

Limited intake of fruit juices is acceptable for infants, as long as it does not interfere with breastfeeding or formula feeding (The Canadian Paediatric Society, Dietitians of Canada, and Health Canada, 1998). Three hundred and fifty women or 65.4% had introduced their babies to fruit juice at an average age of six months.

Mean age at introduction of fruit juice did not significantly differ by the six study breastfeeding duration categories (see Table 19).

Herbal teas can be potentially harmful or toxic to infants (The Canadian Paediatric Society, Dietitians of Canada, and Health Canada, 1998). In addition, sodas, fruit drinks, and punches are not recommend for infants because of their high sugar and low nutrient content. Three mothers indicated that soft drinks were a regular part of their infant's diet and three mothers indicated that their infant consumed tea on a regular basis.

Table 19: Introduction of Other Drinks

Type of Other Drink	*Frequency*	*Percent*	*Average age in months when introduced*
Fruit Juice	350	65.4%	5.79 (5.63 – 5.95)
Pop	3	0.6%	7.00
Tea - aniseed, herbal, Portuguese, baby tea – chamomile & caraway	3	0.6%	5.00

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Solids

Infants are physiologically and developmentally ready for solid foods between the ages of four and six months (The Canadian Paediatric Society, Dietitians of Canada, and Health Canada, 1998). At that time, introduced foods should complement rather than replace breastmilk or formula. Iron fortified infant cereal should be introduced first, followed most commonly by vegetables, and then fruit. Traditionally, meat, meat alternatives, milk products such as cottage cheese, other cheeses, and yogurt are the last to be introduced.

Infant Cereal/Pablum

Almost all of the infants (506 or 94.6%) had been introduced to infant cereal or pablum (see Table 20). Infants were introduced to cereal at a mean age of 4.3 months. Further analyses revealed that those who breastfed for six months or more introduced infant cereal or pablum significantly later than those in the other five study breastfeeding duration categories (4.6 months vs. 3.9; $p<0.001$). Although women who breastfed for three months or less tended to introduce infant cereal earlier on average than recommended, the difference, in fact, is very small, (3.8 months vs. the recommended four months).

Table 20: Introduction of Infant Cereal/Pablum

CATEGORIES	AVERAGE AGE OF BABY IN MONTHS
Never Breastfed	3.79 (3.48 – 4.10)
Breastfed ≤ 2 weeks	3.66 (3.30 – 4.02)
Breastfed >2 weeks - 6 weeks	3.98 (3.48 – 4.48)
Breastfed >6 weeks - 3 months	3.93 (3.65 – 4.21)
Breastfed >3 - < 6 months	4.14 (3.93 – 4.35)
Breastfed ≥ 6 months	4.62 (4.48 – 4.77)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Vegetables

Again, as with infant cereal or pablum, almost all of the infants (520 or 97.2%) had been introduced to vegetables. The average age at introduction was five months. Further analysis found that women who breastfed for six months or more introduced vegetables significantly later than those who never breastfed and those who breastfed their babies two weeks or less (5.6 months vs. 4.9 months; $p<0.001$) (see Table 21).

Table 21: Introduction of Vegetables

CATEGORIES	AVERAGE AGE OF BABY IN MONTHS
Never Breastfed	4.87 (4.59 – 5.15)
Breastfed ≤ 2 weeks	4.95 (4.60 – 5.30)
Breastfed >2 weeks - 6 weeks	5.13 (4.72 – 5.54)
Breastfed >6 weeks - 3 months	5.15 (4.86 – 5.43)
Breastfed >3 - < 6 months	5.19 (5.00 – 5.39)
Breastfed ≥ 6 months	5.55 (5.41 – 5.68)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Fruit

Ninety-three percent of the infants had been introduced to fruit at, on average, five and a half months. Again, women who breastfed for six months or more introduced fruit significantly later than either those who never breastfed or those who breastfed their babies two weeks or less (5.8 months vs. 5.2 months, for both; $p<0.001$) (see Table 22).

Table 22: Introduction of Fruit

CATEGORIES	AVERAGE AGE OF BABY IN MONTHS
Never Breastfed	5.21 (4.92 – 5.50)
Breastfed ≤ 2 weeks	5.18 (4.78 – 5.57)
Breastfed >2 weeks - 6 weeks	5.50 (5.12 – 5.88)
Breastfed >6 weeks - 3 months	5.44 (5.11 – 5.77)
Breastfed >3 - < 6 months	5.52 (5.31 – 5.72)
Breastfed ≥ 6 months	5.80 (5.65 – 5.95)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Other Foods

Three hundred and forty-five or 64.5% of the survey respondents had introduced their infants to meat or meat alternatives at an average age of seven months. Approximately one third had introduced their infants to cheese, at again seven months. About 21% had introduced their babies to grains such as bread and pasta at, on average, seven months. And 30.3% had introduced their babies to snacks such as cookies at, on average, seven months (see Table 23).

Table 23: Introduction of Other Foods

	Frequency	*Percent*	*Average age in months when introduced*
Meat or alternatives	345	64.5%	6.90 (6.79 – 7.01)
Cheese, yogurt, cottage cheese	177	33.1%	6.89 (6.70 – 7.08)
Other grains: bread, pasta, rice, cereal	113	21.1%	7.15 (6.93 – 7.37)
Snacks: cookies/biscuits, crackers, Jell-O or pudding, ice-cream	162	30.3%	6.80 (6.61 – 7.00)

Note: The numbers in the brackets show the 95% confidence interval associated with the point estimate.

Socio-demographic Factors and Breastfeeding Duration

Although previous studies have found family income, maternal age, and education to be influential factors in the choice of whether or not one breastfeeds and for how long they breastfeed, the current study did not find the same associations.

Discussion

The 1998 breastfeeding initiation and duration rates for Middlesex-London are higher than the 1994/95 provincial rates and higher than those in other Ontario cities that have conducted breastfeeding studies in the last ten years. However, because breastfeeding duration rates have been increasing over time and these studies were conducted several years ago, it is unknown if Middlesex-London rates are in fact uniquely higher or whether this is a time trend that would be observed in other communities.

In recent years, several initiatives and educational programs have been launched in Middlesex-London to assist women with their infant feeding concerns. For example, since 1993, Breastfeeding Clinics have been available in Middlesex-London to support women with their breastfeeding concerns. In 1997, in addition to the regular phone counseling support, the Middlesex-London Health Unit established an after hours "Infant Line", where public health nurses are available to answer questions about infant feeding issues. In addition, advanced educational opportunities have been available to health care providers to ensure that they have the most current knowledge about the benefits and challenges of breastfeeding, in order to educate and assist others.

Just over half of the survey participants made the decision about how they would feed their baby prior to conception. Consistent with previous research, the women who participated in this study generally followed through with their prenatal thoughts about feeding methods.

Rooming-in, breastfeeding on demand, and minimizing the time between birth and the time the infant is first breastfed are practices which have been reported to increase breastfeeding success (Perez- Escamilla, Pollit, Lonnerdal, & Dewey, 1994). Additionally, “bedding in”, that is to say, when the baby is lying with the mother as opposed to lying in a bassinet either in the mother's hospital room or in the nursery, has been thought to promote breastfeeding. Moxley, Avni, Brydon, & Kennedy (1998) found that “bedding in” encourages frequent breastfeeding, which in turn stimulates the release of prolactin, the hormone which aids in the production of milk. Prolactin peaks in response to suckling and is produced in high levels at night. This, in turn, aids in the onset of lactation in the early days postpartum.

In the current study, 69.2% of infants were breastfed within an hour after birth and 39% of the babies “bedded in”. Women who initiated breastfeeding more than an

hour after birth were more likely to breastfeed for six weeks or less, whereas women who initiated breastfeeding within an hour after birth were more likely to breastfeed for six weeks or longer. Although not statistically significant, the proportion of women whose infants' "bedded in" was highest in the group that breastfed for six months or more. This suggests that bedding in may be an important factor in breastfeeding duration. "Bedding in" is a practice that only recently has been encouraged at hospitals in Middlesex-London.

While in the hospital 64.5% of women indicated having some difficulty with breastfeeding. The most frequently mentioned problem, indicated by 33.5% of the survey participants, was difficulty latching the baby to the breast. This suggests that assistance with breastfeeding during the first few days postpartum may be critical to breastfeeding duration.

Among women who chose not to breastfeed, the most common reason for not breastfeeding was "personal choice", which accounted for 39.7% of the responses. For this study, physical discomfort with breastfeeding, emotional discomfort, embarrassment, or simply preferring not to were categorized as personal choice. Matthews et al. (1998) also found that 43.7% of women who chose not to breastfeed did so because of "personal choice". Promoting breastfeeding as the norm and promoting breastfeeding friendliness is likely to help change population attitudes towards breastfeeding over time and assist women in being more comfortable with breastfeeding.

The second most common reason for not initiating breastfeeding was a previous negative breastfeeding experience. Multiparous women with a previous negative breastfeeding experience are likely to need support to attempt to breastfeed again. Health professionals need to be aware of past breastfeeding experiences in order to counsel women prenatally, perinatally, and postnatally about breastfeeding.

Women who breastfed for six months or more reported being significantly more satisfied with breastfeeding than women who breastfed for two weeks or less. In addition, and not surprisingly, mean scores for breastfeeding satisfaction increased as breastfeeding duration increased. However, it is not clear whether breastfeeding duration increased satisfaction or if satisfaction with breastfeeding increased duration.

Further, a number of studies have been done on the association between maternal affect and breastfeeding. Although the results are somewhat conflicting, previous

studies indicated that if the breastfeeding experience is positive, breastfeeding can increase positive maternal affect. However, if breastfeeding is not going well, the experience may be detrimental to maternal emotional well-being, particularly if the mother suffered from depression prior to the birth of the baby (Tamminen, 1988; Adler & Bancroft, 1988).

Reasons cited for breastfeeding cessation in the current study are consistent with previous studies. For example, from six weeks to four months postpartum, the most frequently cited reason for discontinuing breastfeeding was maternal perception of inadequate milk supply. Not surprisingly, women who stopped breastfeeding because of insufficient milk supply tended to do so during the period of time when infants would be growing at a rapid rate, therefore putting greater demand on the mother's milk supply. This is consistent with the findings of Hill (1991), Bourgoin et al., (1996) and Matthews et al. (1998).

Twenty-five percent of women indicated that they discontinued breastfeeding because they had returned to work or school. Similarly, Bourgoin et al. (1996) found that at six months postpartum, returning to work outside the home was the most common reason for discontinuing breastfeeding and was mentioned by 37.5% of women. Just over half of the participants in the current study indicated that their workplace or school was not supportive of breastfeeding. Promoting the benefits of breastfeeding to employers would help to make places of employment more "breastfeeding friendly". For example, employers should be made aware that maternal absenteeism may decrease as a result of improved infant health.

Only 16% (n=74) of women had been encouraged to stop breastfeeding. Most commonly, those who were encouraged to stop were women that breastfed two weeks or less and women who breastfed for six months or more. The family doctor was the most likely to discourage breastfeeding at two weeks or less. For women who breastfed for six months or more, friends, mothers and mothers-in-law were most likely to discourage breastfeeding. Perhaps women are discouraged from breastfeeding early on due to medical reasons, but after breastfeeding for six months or more, they are discouraged primarily for social reasons.

In the current study it seems that internal or personal factors may have a greater influence on breastfeeding choices than socio-demographic factors such as age, education, and income. However, the current study results may be a function of the high level of education found in the study sample. With less variation in maternal education, we may have been limited in assessing the effects of maternal education.

As well, other demographic characteristics of this sample may have influenced the results. For example, there was a greater percentage of multiparous women in the present study who had breastfed previous children and, in turn, breastfed the current infant. This may help explain the high proportion of women who initiated breastfeeding noted in this study.

Eighty-seven percent of the women in this survey had received formula samples or coupons. Of these, 82% were received by mail. Fifty-nine percent of the women who received formula samples or coupons had used them by the interview. Women who never breastfed were significantly more likely to use either the formula or the coupons sooner than women who breastfed for six months or more. Providing samples to women may be detrimental to breastfeeding. The International World Health Organization's (WHO) Code (1990) states that formula companies should not distribute free samples or gifts to mothers, and that there should by no public advertising. More action needs to be taken by the government, health professionals, and the public to support the International WHO Code.

Most women follow the guidelines developed by the Canadian Paediatric Society when introducing their infant to other fluids or solids. However, 14% of women gave their infants cow's milk before the recommended nine months and 22% of women introduced cereal before the minimum recommended four months. Women need to have consistent information on the nutritional needs of their children. Health care professionals should use a team approach to attend to maternal and child needs and promote optimal infant nutrition and family health.

Conclusions

This study was conducted to determine current breastfeeding initiation and duration rates in Middlesex-London. Among the 535 study participants, 88% initiated breastfeeding. Among the 471 women who initiated breastfeeding, 61.8% breastfed to four months and 53.7% breastfed for six months or more.

Factors associated with breastfeeding initiation and duration are shown in Table 24. Women were more likely to initiate breastfeeding if their decision on how to feed their baby was made prior to conception and if they had been satisfied with their previous breastfeeding experience.

In this study, breastfeeding duration was associated with prenatal, perinatal and postnatal factors. As suggested in the literature, women were more likely to breastfeed for the recommended six months if their infant feeding decision had been made prior to conception and if they had planned to give their infant only breastmilk.

Several in-hospital factors were associated with breastfeeding duration. Women were more likely to breastfeed for six months or more if: their baby was put to the breast within an hour of birth, there were no problems with latching, there were few problems or concerns, and the required amount of help was received.

Table 24: Factors Associated with Breastfeeding Initiation and Duration

Breastfeeding Initiation	Breastfeeding Duration
• satisfaction with past breastfeeding experience • infant feeding decision made prior to conception	• infant feeding decision made prior to conception • planned to feed baby breastmilk exclusively • time between birth and initial breastfeeding • problems with latch • number of in-hospital problems • the amount of in-hospital help received • satisfaction with current breastfeeding experience • perceived insufficient milk supply • employment situation

Postnatal factors were also associated with breastfeeding duration. Women were more likely to breastfeed for six months or more if: they were satisfied with the current breastfeeding experience, they thought the infant was receiving a sufficient amount of milk, and they did not have to return to work in the first six months.

Because the study excluded the women most likely to have breastfeeding difficulties (women aged less than 18, with previous breast surgery, with premature infants or infants with congenital anomalies), local population breastfeeding initiation and duration rates are likely to be lower than the rates found among the study participants.

Recommendations

The survey results show that 88% of women initiated breastfeeding in Middlesex-London. One of the goals of the Ontario Ministry of Health's Mandatory Health Programs and Services Guidelines (1997) is to increase to 50% the percentage of infants breastfed up to six months by the year 2010. Of the women who initiated breastfeeding, 53.7% breastfed for six months or longer, thereby achieving the goal set by the Mandatory Health Programs and Guidelines.

Achieving this provincial milestone is a tremendous accomplishment. This local achievement can be attributed, at least in part, to increased awareness of the benefits of breastfeeding, advanced educational opportunities for health care providers and the establishment of supports such as breastfeeding clinics.

Although just over 50% the study participants breastfed six months or more, almost half did not attain this goal, and 12% never initiated breastfeeding. Because breastmilk provides the healthiest start for infants, the real objective is to have **all** women who are able to breastfeed do so for at least six months. In order to achieve this objective, the following recommendations are offered. The recommendations from this report fall into four main themes.

Increased Awareness

It is important to increase community awareness not only about the benefits of breastfeeding, but also about the supports that are needed for women to be successful in their breastfeeding. We need to promote Middlesex-London as a community that supports breastfeeding and is breastfeeding friendly.

Educational Opportunities

This study found that the majority of women make the decision whether or not to breastfeed prior to conception. Therefore, students in family studies classes in high school would likely benefit from the inclusion of breastfeeding information in the curriculum.

Health fairs, prenatal classes and prenatal breastfeeding classes are important avenues to provide information to women who have not yet made their infant feeding decisions. They also provide families with information about the benefits of breastfeeding, the mechanics of breastfeeding and community supports.

Health care providers with the most current breastfeeding knowledge need to continue to educate women, their families and friends, as well as the entire community about the benefits and challenges of breastfeeding.

Family and friends can be a great source of encouragement as well as discouragement for the breastfeeding mother. Increasing the knowledge of breastfeeding among family and friends will help to ensure that they are a support to the breastfeeding mother.

Barriers

Strategies used to market formula are a deterrent to those breastfeeding, especially women who are struggling with breastfeeding. Health care providers and the community as a whole need to take an active role in discouraging the practice of formula companies sending unsolicited samples to pregnant women or women who have recently given birth.

Women should be supported when breastfeeding in public places such as malls and restaurants. The community should work together to remove barriers that undermine the initiation and continuation of breastfeeding, and to normalize breastfeeding as an accepted method of infant feeding.

Supports

Everyone involved with women who have just given birth and their babies needs to empower women and assist them with the concerns or challenges they may face when breastfeeding.

In addition, health care providers are encouraged to continue to use a team approach in attending to maternal and child needs. A team approach is also needed to promote optimal infant nutrition and family health.

Women who plan to breastfeed need to be aware of the initial difficulties they may have with establishing breastfeeding and what supports are available to them.

There is a need to increase supports available to women both in the hospital and the community to assist them with any breastfeeding concerns or problems.

The provision of seminars or classes for breastfeeding women who are planning to return to work would provide women with strategies on how to continue breastfeeding when working outside the home.

References

Adler, E., & Bancroft, J. (1988). The relationship between breastfeeding persistence , sexuality and mood in postpartum women. Psychological Medicine, 18, 389-396.

Bernard-Bonnin, A. C., Statchenko, S., Girard, G., & Rousseau, E. (1989). Hospital practices and breastfeeding duration: A meta-analysis of controlled trials. Birth, 16, 64-66.

Bourgoin, G., Lahaie, N., Berger, M., Dovigi, C., Picard, L., Rheaume, B., & Sahai, V. (1996). Factors influencing the duration of breastfeeding in the regional municipality of Sudbury. PHERO, June 28, 297-302.

Canadian Paediatric Society, Dieticians of Canada, & Health Canada. (1998). Nutrition for Healthy Term Infants. Minister of Public Works and Government Services, Ottawa.

Health Canada. (1999). Breastfeeding in Canada: A review and an update. Author, Ottawa, Canada.

Hill, P. (1991). Predictors of breast-feeding duration among WIC and non-WIC mothers. Public Health Nursing, 8, 46-52.

Lawson, K., & Tulloch, M. (1995). Breastfeeding duration: Prenatal intentions and postnatal practices. Journal of Advanced Nursing, 22, 841-849.

Losch, M., Dungy, C., Russell, D., & Dusdieker, L. (1995). Impact of attitudes on maternal decisions regarding infant feeding. The Journal of Pediatrics,126, 507-514.

Matich, J. R., & Sims, L. (1992). A comparison of social support variables between women who intend to breast or bottle feed. Social Science Medicine, 34, 919-927.

Matthews, K., Webber, K., McKim, E., Banoub-Baddour, S., & Laryea, M. (1998). Maternal infant-feeding decisions: Reasons and influences. Canadian Journal of Nursing Research, 30(2), 177-198.

Ontario Health Survey 1990. Ontario Ministry of Health, Toronto, Canada.

Ontario Ministry of Health. (1997). Mandatory health programs services and guidelines. Public Health Branch, Ontario Ministry of Health, Toronto, Canada.

Moxley, S., Avni, G., Brydon, S., & Kennedy, M. (1998). Breastfeeding and shorter hospital stays. The Canadian Nurse, AU, 35-40.

Perez-Escamilla, R., Pollit, E., Lonnerdal, B., & Dewey, K .G. (1994) Infant feeding policies in maternity wards and their effect on breastfeeding success: An analytical overview. American Journal of Public Health, 84, 89-97.

Ryan, A., & Martinez, G. (1989). Breast-feeding and the working mother: A profile. Pediatrics, 83, 524-531.

Siemiatycki, J. (1979). A comparison of mail, telephone and home interview strategies for household health surveys. American Journal of Public Health, 69, 238-245.

Williams, P. L., Innis, S. M., Vogel, A. M., & Stephen, L. J. (1999). Factors influencing infant feeding practices of mothers in Vancouver. Canadian Journal of Public Health, 90, 114-119.

Tamminen, T. (1988). The impact of mother's depression on her nursing experiences and attitudes during breastfeeding. Acta Paediatrica Scandinavica Supplementum, 77 (344), 87-94.

Tarkka, M. T., Paunonen, M., & Laippala, P. (1998). What contributes to a breastfeeding success after childbirth in a maternity ward in Finland? Birth, 25(3), 175-181.

WHO/UNICEF (1990). Innocenti declaration on the protection, promotion, and support of breastfeeding. Geneva: World Health Organization.