Peel Infant Feeding Survey

2017 Annual Summary Report

A Region of Peel – Public Health Technical Report

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KEY MESSAGES

- Almost all mothers (98%) reported initiating breastfeeding either in hospital or after discharge.
- Approximately half (45%) of mothers reported their infant was given liquids other than breast milk, primarily formula, in the hospital.
- The percentage of mothers exclusively breastfeeding at six months in 2017 was similar to 2016, at 13%.
- Similar to the survey results in 2016, the rates of any breastfeeding gradually declined following hospital discharge with 68% of mothers providing any breast milk at six months.
- Most mothers (88%) who had given their infant a vitamin D supplement reported that they had done so every day or almost every day.
- Similar to the survey results in 2016, 25% of infants continue to be offered solid foods either too early (less than five months) or too late (more than seven months).

INTRODUCTION

Infant feeding decisions and practices have immediate and lifelong effects on the health of mothers and their infants. In the first six months of life, breast milk is the only food an infant needs for healthy growth and development. A daily vitamin D supplement is also required for breastfed infants and infants who consume formula in smaller amounts.[1]

Breastfeeding provides benefits to both the infant and mother. Infants who are exclusively breastfed are less likely to develop otitis media (middle ear infection), gastrointestinal infections, and lower respiratory infections compared to infants who are partially or never breastfed.[2] Children who were ever breastfed have reduced odds of being overweight or obese compared to children who were never breastfed.[2] Mothers have a lower risk of developing breast cancer when they breastfeed for at least 12 months in their lifetime.[3]

There are risks of discontinuing breastfeeding and introducing solid foods too early. Early introduction of solids limits the benefits of exclusive breastfeeding for the infant and mother and is associated with a potential decrease in milk supply.[4]

In May of 2015, Region of Peel – Public Health initiated the Peel Infant Feeding Survey (PIFS). The PIFS is an annual cross-sectional survey designed to support the collection, analysis, and dissemination of information regarding infant feeding practices of Peel mothers. Findings are used to inform public health programming around infant feeding and related community programs in order to support optimal infant feeding practices in Peel region.

PURPOSE OF THE INFANT FEEDING SURVEY

The data collected through the PIFS will be used for:

1. Informing the Family Health Division's Breastfeeding/Infant Feeding programs;
2. Actioning population health assessment and surveillance activities, as outlined in the Population Health Assessment and Surveillance Protocol (2018)[5], to ensure up-to-date local level data on breastfeeding in Peel;
3. Planning breastfeeding programs and services in the community and with hospital partners.

At the beginning of this project, the maintenance of Region of Peel – Public Health's Baby-Friendly Initiative (BFI) designation was also an objective of data collection. However, in 2019 it was decided not to continue with formal re-designation. As a result, this objective is no longer relevant.

PURPOSE OF THE REPORT

The purpose of this report is to provide the results of data collected between April 18 and June 27, 2017 through the Peel Infant Feeding Survey with 457 mothers.

HOW TO READ THIS REPORT

The methods and data limitations are described in the *Methods* section of this report.

In some tables, ninety-five per cent confidence intervals (presented as "95% CI" in the report) are provided for many of the estimates (e.g. percentages). The confidence interval presents a lower and upper range of values, which we are confident, contains the true value of the estimate for the whole population 95% of the time, or 19 times out of 20.

For example, 68% of Peel mothers provided any breastfeeding to their infant at six months with a confidence interval for that estimate of 64% and 72%. This means if we repeated the study twenty times using different samples of the same size from the same population; on nineteen occasions the estimate would be somewhere between 64% and 72%, while on one occasion the estimate would be below 64% or above 72%. We could say that we are 95% sure the actual percentage of any breastfeeding for infants at six months in the population is between 64% and 72% and in this particular study, the sample estimate is 68%.

When the 95% confidence interval of the estimate for one group does not overlap with that of another group, the difference between the estimates is considered statistically significant (i.e. unlikely to be due to chance). If the confidence intervals of two estimates do overlap, the estimates may still be significantly different. An appropriate statistical test would be required to assess the statistical difference of the two estimates.

DEFINITION OF TERMS

In this report, ***breastfeeding*** is defined as any self-reported attempt to feed the infant at the breast, or feed breast milk or mother's milk by cup, tube, or bottle. ***Breastfeeding initiation*** is measured by the question "Have you ever tried to feed your baby breast milk?"

Exclusive breastfeeding is defined as breastfeeding only, without additional food or liquid (e.g. water, sugar water or formula) excluding vitamins, minerals, or required medication. By this definition, an infant would no longer be classified as exclusively breastfeeding after consuming only a single sip of water or other liquid.

Combination feeding occurs when an infant receives any combination of formula and breast milk.

Eligible mothers were six to eight months postpartum at the initiation of this survey, residing in one of Peel's municipalities, and 15 years of age or older. Those who had known involvement with the Children's Aid Society, or experienced a stillbirth or had a live born infant who died were not eligible to participate. For additional details about eligible mothers, please see *Methods – Survey Sampling*.

RESULTS

Between April 18 and June 27, 2017, a total of 457 surveys were completed with eligible mothers. Fewer than 10 surveys were completed by teen mothers aged 15 to 19 years. Given the reporting restrictions noted in the *Methods* section, this report cannot provide results according to teen respondents.

Response Rate

Table 1 presents the call disposition status for the 903 eligible records available in the Peel Infant Feeding Survey (PIFS) database. Not presented in the table are 39 ineligible, 152 not in service, six invalid telephone numbers and 100 records that were not contacted before the target number of completed surveys was reached. These records were excluded from the denominator for the purposes of calculating the response rate. Not in service includes: business numbers; fax/computer line; moved, with no new number given; not in service numbers; and wrong numbers.

Table 1
Call Disposition Status,
Peel, 2017

Status	Number	Per cent
Completed survey	457	50.6%
Other call types†	39	4.3%
Refused	126	14.0%
Terminated‡	281	31.1%
Total	903	

†Other call types include answering machine, those who requested a call back, hung up, line busy, no answer, partial complete of survey or language barrier.
‡Terminated includes records that were not reached before the maximum number of call attempts.

To calculate the response rate, the total number of completed surveys was divided by the total number of potentially eligible calls. The response rate for the PIFS was 51%.

Characteristics of Respondents

Table A1 (Appendix) provides a description of the un-weighted sample of mothers from the PIFS. Table 2 compares select characteristics among survey respondents to Peel mothers. A smaller proportion of survey respondents are younger than 30 years and multiparous compared to Peel mothers. The proportion of survey respondents who had a vaginal birth and are legally married are similar to Peel mothers. Comparisons for the proportion of immigrants and post-secondary graduates are not available.

Table 2
Selected Demographic Comparison of Survey Respondents to Peel Mothers, Peel

Characteristic	Per cent of respondents[A] (95% CI)	Per cent of Peel mothers
Younger than 30 years	26.3 (22.4 – 30.5)	33.9[B]
Multiparous	43.0 (38.5 – 47.6)	61.3[B]
Vaginal birth	69.5 (65.1 – 73.6)	70.1[B]
Legally married	82.3 (78.5 – 85.5)	79.6[C]
Immigrants	69.1 (64.7 – 73.2)	NA
Post-secondary graduates	77.5 (73.4 – 81.1)	NA

NA = Not Applicable. No comparison statistic for mothers was available.
Note: Unweighted data
Sources:
[A]Peel Infant Feeding Survey 2017, Region of Peel – Public Health.
[B] Public Health Unit Analytic Reporting Tool (Cube), 2017, BORN Information System (BIS), BORN Ontario. Information accessed on May 13, 2019.
[C]Ontario Live Birth Database, 2012, Ontario Registrar General. IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Additionally, among mothers who responded: 91% who had a previous child had breastfed at least one of their previous children; 52% of primiparous mothers attended a prenatal class (in person or online), whereas 9% of multiparous mothers attended a prenatal class; and 93% delivered an infant born at 37 weeks or more (full-term).

Characteristics of Non-Respondents

The characteristics of those who completed the Peel Infant Feeding Survey were compared to those who were selected from the Integrated Services for Children Information System (ISCIS) but did not respond to the survey (i.e. non-respondents). Table A2 (Appendix) shows the comparison of respondents and non-respondents. Non-respondents included those who were not reached before the maximum number of call attempts, had a not in service or invalid number, declined to participate/consent, were not eligible or were selected from ISCIS but were not contacted because the target number of completed surveys was reached, as well as other reasons listed in Table A2 (Appendix). Respondents were similar to non-respondents based on: municipality of residence, gestational age, infant sex, infant birth weight, type of birth, feeding method at hospital discharge and method of delivery. Survey respondents had a significantly higher mean age (32.3 years) than non-respondents (31.3 years), although the difference is small.

Intention to Breastfeed

While pregnant, mothers were intending to feed their baby the following during the first four weeks of life:

- Breast milk only (80%)
- Combination of foods (e.g. breast milk, formula, juice) (17%)
- Formula only (3%*- use estimate with caution)

These results are not significantly different from 2016 survey results.

Breastfeeding Initiation

Almost all mothers (98%) reported initiating breastfeeding either in hospital or after discharge.

Reasons for not breastfeeding included:

- Did not consider breastfeeding or planned to bottle feed/formula feed
- Maternal medication
- Milk did not come in or did not come in enough

Feeding While in Hospital

Overall, 93% of mothers reported breastfeeding in the hospital. A small percentage of women who did not breastfeed while in hospital initiated breastfeeding after discharge (5%* - use estimate with caution). Of those who had a hospital birth and tried to breastfeed, 88% reported receiving help from a health professional while in hospital.

Approximately half (45%) of mothers reported their infant was given liquids other than breast milk in hospital. For these infants, 95% were given formula; other infants received sugar water. A small percentage (5%* - use estimate with caution) of these infants were given both formula and other liquids such as sugar water.

Among mothers who initiated breastfeeding, the reasons for feeding babies liquids other than breast milk while in hospital included (multiple reasons possible):

- Perception of not having enough breast milk (47%)
- Latching concerns (14%)
- Baby was hungry (13%)
- Baby was ill (11%)
- Baby had low blood sugar (11%)
- Concerns about baby's weight (8%)

About one in four mothers (22%) reported being given formula to take home with them when they left the hospital. This has decreased from 2016, when close to one-third of mothers (32%) were given formula to take home.

For mothers who gave birth in hospital, 31% reported being given formula to take home at William Osler Health System – Brampton Civic Hospital, 11%* (*use estimate with caution) at Trillium Health Partners – Credit Valley Hospital and 11%* (*use estimate with caution) at Trillium Health Partners – Mississauga Hospital. The percentage decreased at the Trillium Health Partners – Mississauga Hospital from the previous year (30%* - use estimate with caution in 2016).

Feeding Within First Two Weeks (postpartum)

Ninety-five per cent of mothers were breastfeeding at two weeks after hospital discharge, of which 35% introduced formula to their infant during this time. Of these mothers who introduced formula while breastfeeding in the first two weeks, 67% provided breast milk and 20% provided formula for the majority of feedings (more than half of these feedings).

Breastfeeding Duration

Overall, 89% of mothers were breastfeeding at two months and 79% were breastfeeding at four months after hospital discharge (Table 3, Figure 1). By six months, 68% of mothers were breastfeeding. These rates for any breastfeeding were not statistically different compared to findings from the 2016 survey.

Rates of breastfeeding were lower among mothers who received formula to take home from the hospital, but the results were not statistically significant (Appendix Table A3). These findings were not different from 2016 results.

Among mothers who stopped breastfeeding, the most common reasons for stopping were (multiple responses possible):

- Perception of not having enough breast milk (64%)
- Breast refusal (11%)
- Not latching (8%)
- Mother was fatigued/exhausted/needed to rest/no time (7%)
- Baby was hungry (5%)

Table 3
Any Breastfeeding Duration,
Peel, 2015 – 2017

Breastfeeding duration	2017	2016	2015
	Per cent (95% CI)	Per cent (95% CI)	Per cent (95% CI)
Two weeks	95.2 (92.8 – 96.8)	95.8 (93.5 – 97.3)	95.0 (92.5 – 96.6)
1 month	93.7 (91.0 – 95.6)	92.3 (89.5 – 94.4)	91.5 (88.5 – 93.7)
2 months	89.3 (86.1 – 91.8)	88.4 (85.0 – 91.0)	87.2 (83.8 – 90.0)
3 months	84.9 (81.4 – 87.9)	83.1 (79.3 – 86.3)	81.8 (77.9 – 85.1)
4 months	79.2 (75.3 – 82.7)	77.1 (73.0 – 80.8)	74.2 (70.0 – 78.1)
5 months	73.5 (69.3 – 77.4)	71.2 (66.9 – 75.2)	67.9 (63.4 – 72.0)
6 months or longer	68.3 (63.9 – 72.4)	66.8 (62.3 – 71.0)	63.9 (59.3 – 68.2)

CI: Confidence Interval
Source: Peel Infant Feeding Survey 2015 – 2017, Region of Peel – Public Health.

Exclusive Breastfeeding

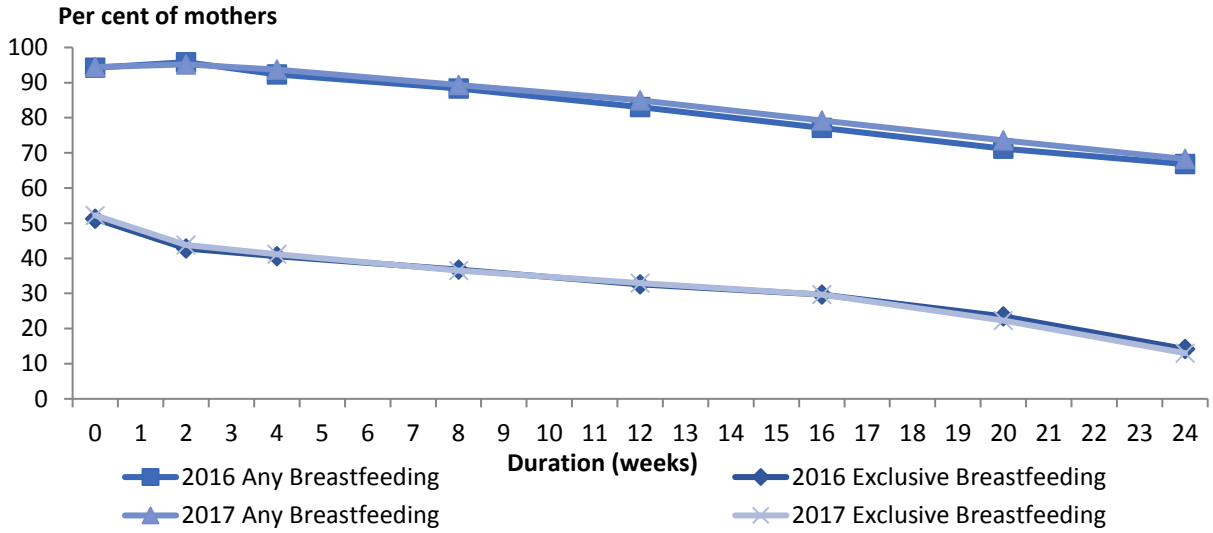
Although almost all mothers initiated breastfeeding, only 52% reported exclusively breastfeeding at the time of discharge from hospital. As most infants (77%) stay in hospital for less than 72 hours (Appendix Table A1), this is a significant drop in a short time. However, some of these infants may have been given supplementation due to health concerns. Thirteen per cent of mothers reported exclusively breastfeeding at six months postpartum (Table 4). The percentage of mothers exclusively breastfeeding was similar to the 2016 results (Table 4, Figure 1).

Table 4
Exclusive Breastfeeding Duration,
Peel, 2015 – 2017

Breastfeeding duration	2017	2016	2015
	Per cent (95% CI)	Per cent (95% CI)	Per cent (95% CI)
Two weeks	43.8 (39.3 – 48.4)	42.8 (38.3 – 47.4)	38.2 (33.8 – 42.8)
1 month	41.2 (36.7 – 45.8)	40.6 (36.1 – 45.2)	33.3 (29.1 – 37.8)
2 months	36.5 (32.2 – 41.1)	36.8 (32.5 – 41.4)	29.8 (25.8 – 34.2)
3 months	33.0 (28.8 – 37.5)	32.6 (28.4 – 37.1)	27.1 (23.2 – 31.4)
4 months	29.7 (25.6 – 34.0)	29.7 (25.7 – 34.1)	22.8 (19.1 – 26.9)
5 months	22.3 (18.7 – 26.4)	23.5 (19.8 – 27.7)	15.7 (12.6 – 19.4)
6 months or longer	13.0 (10.2 – 16.5)	14.2 (11.3 – 17.7)	6.7* (4.7 – 9.4)

*Use estimate with caution
CI: Confidence Interval
Source: Peel Infant Feeding Survey 2015 – 2017, Region of Peel – Public Health.

Figure 1
Duration of Any Breastfeeding and Exclusive Breastfeeding to Six Months Postpartum,
Peel, 2016-2017



Source: Peel Infant Feeding Survey 2016 – 2017, Region of Peel – Public Health.

Breastfeeding Support and Concerns

Of mothers who ever breastfed, 42% experienced difficulties or concerns with breastfeeding. The most common concerns with breastfeeding included (multiple responses possible):

- Not latching (46%)
- Perception of not having enough breast milk (44%)
- Sore nipples (13%)
- Sore breasts/mastitis, engorgement (10%)
- Nipple anatomy (flat or large nipples) (7%)

The most common concerns with breastfeeding are similar to the 2016 results, except that nipple anatomy was more frequently reported in 2017.

After being discharged from the hospital, 48% of mothers who attempted to breastfeed reported a time when they would have benefited from a breastfeeding program or service. Of these women, 15% were not able to use a breastfeeding program or service. The most common reasons for not being able to use a breastfeeding program or service included (multiple responses possible):

- Transportation (25%)
- Postpartum challenges (22%)
- Not available when requested (22%)

Similar to 2016 results, transportation remains the most common reason for not being able to use a breastfeeding program or service. Unlike 2016 and 2015 results, being too busy was not a commonly reported reason in 2017. Not available when requested appears as a common reason for not accessing a support program or service, which was previously unseen in the 2015 or 2016 reports. Postpartum challenges were reported as a most common reason in 2015 but not 2016.

After leaving the hospital, 45% of all mothers used a breastfeeding program or service. Of these mothers, 87% reported needing breastfeeding assistance. The most common places where mothers received help with breastfeeding were (multiple responses possible):

- Breastfeeding clinic (57%)
- Home visit by any professional (37%)
- At the hospital (26%)
- Telephone support (10%)
- Internet resource (8%)
- Doctor's office (8%)

Compared to 2016 results, there was an increase in the proportion of mothers receiving breastfeeding help at a home visit by any professional (37% in 2017 compared to 21% in 2016), while a decrease was observed at the hospital (26% in 2017 compared to 44% in 2016).

Vitamin D

While breastfeeding, 88% of mothers said they had given their infant a vitamin D supplement at least once. Among mothers who had given their infant a vitamin D supplement, 88% had done so either every day (64%) or almost every day (25%). Based on the recommendations of the Institute of Medicine (2011)[1], Peel's Family Health Division recommends that all breastfed infants receive a daily vitamin D supplement of 10 µg (400 IU) beginning in the first week of life and continuing until the infant's diet includes at least 10 µg (400 IU) per day of vitamin D from other dietary sources.

Introduction of Liquids

Among mothers who breastfed their infant, 85% had ever introduced another liquid. Among these infants, 52% received formula and no other liquids, 28% received liquids other than formula, and 21% received formula and other liquids. These results are similar to what was reported in 2016.

Mothers who breastfed their infant were asked when their infant was first given formula. In total, 57% of breastfed infants who received formula and no other liquids were given it before the age of two weeks (Table 5).

Table 5
Introduction of Formula and No Other Liquids Among Breastfeeding Mothers, Peel, 2017

Timing of Liquids	Per cent	95% Confidence interval
Less than 2 weeks	56.9	49.8 – 63.7
2 weeks to less than 1 month	7.7*	4.7 – 12.4
1 to less than 2 months	8.2*	5.1 – 13.0
2 to less than 3 months	5.6*	3.1 – 9.9
3 to less than 4 months	6.7*	3.9 – 11.2
4 to less than 5 months	5.1*	2.8 – 9.3
5 to less than 6 months	NR	NR
More than 6 months old	6.2*	3.5 – 10.6

*Use estimate with caution
N = 195
NR = Not releasable due to small numbers
Note: Mothers introduced formula at least once and may or may not be continuing to formula feed.
Source: Peel Infant Feeding Survey 2017, Region of Peel – Public Health.

Additionally, mothers who breastfed their infant were asked when their infant was first given liquids other than formula, such as water, honey, sugar water, juice, tea or gripe water. For breastfed infants who received liquids other than formula, 79% were not introduced to other liquids until they were at least five months old (Table 6).

Finally, among breastfed infants who were introduced to both formula and other liquids, 52% were given formula and liquids other than breast milk before the age of two weeks (Table 7). For additional details about liquids introduced in hospital, please see the *Feeding While in Hospital* section.

Table 6
Introduction of Liquids Other than Formula Among Breastfeeding Mothers, Peel, 2017

Timing of Liquids	Per cent	95% Confidence interval
Less than 2 weeks	NR	NR
2 weeks to less than 1 month	NR	NR
1 to less than 2 months	NR	NR
2 to less than 3 months	NR	NR
3 to less than 4 months	NR	NR
4 to less than 5 months	NR	NR
5 to less than 6 months	16.7*	10.7 – 25.1
More than 6 months old	62.0	52.4 – 70.8

*Use estimate with caution
N = 108
NR = Not releasable due to small numbers
Note: Mothers introduced liquids other than formula at least once and may or may not be continuing to feed these liquids.
Source: Peel Infant Feeding Survey 2017, Region of Peel – Public Health.

Table 7
Introduction of Formula and Other Liquids Among Breastfeeding Mothers, Peel, 2017

Timing of Liquids	Per cent	95% Confidence interval
Less than 2 weeks	51.9	40.8 – 62.7
2 weeks to less than 1 month	NR	NR
1 to less than 2 months	NR	NR
2 to less than 3 months	12.4*	6.7 – 21.7
3 to less than 4 months	NR	NR
4 to less than 5 months	NR	NR
5 to less than 6 months	NR	NR
More than 6 months old	NR	NR

*Use estimate with caution
N = 81
NR = Not releasable due to small numbers
Note: Mothers introduced formula and other liquids at least once and may or may not be continuing to feed these liquids.
Source: Peel Infant Feeding Survey 2017, Region of Peel – Public Health.

Among mothers who introduced other liquids to their breastfed infant, 72% had introduced formula to their infant after being discharged from hospital or midwifery care. Other common liquids introduced after being discharged were (multiple responses possible):

- Water (46%)
- Juice (9%)

The most common reasons among breastfeeding mothers for introducing formula and no other liquids to babies included (multiple responses possible):

- Perception of not having enough breast milk (57%)
- Baby was hungry (15%)
- Planned to supplement with formula (9%)
- Not latching (6%)
- Baby's weight concerns (6%)

The most common reasons among breastfeeding mothers for introducing liquids other than formula to babies included (multiple responses possible):

- Supplementing solid foods (25%)
- Appropriate age (16%)
- Health professional's advice (13%)
- Hydration or constipation (12%)

The most common reasons among breastfeeding mothers for introducing formula **and** other liquids to babies included (multiple responses possible):

- Perception of not having enough breast milk (51%)
- Appropriate age (21%)
- Hydration or constipation (20%)
- Supplementing solid foods (19%)

The reasons for introducing formula and no other liquids among breastfeeding mothers are mostly consistent with the 2016 survey results.

Introduction of Solids

Mothers were asked when their infant was first given solid foods such as infant cereal, fruits, vegetables, meat products, dairy products, grain products, eggs, or legumes. In total, 75% of infants were given solids around the recommended age of six months (Table 8).

Table 8
Introduction of Solids,
Peel, 2017

Timing of solids	Per cent	95% confidence interval
Less than 4 months	3.2*	1.9 – 5.3
4 to less than 5 months	18.3	15.0 – 22.2
5 to less than 6 months	32.7	28.5 – 37.3
6 to less than 7 months	42.7	38.1 – 47.4
7 to less than 8 months	3.2*	1.9 – 5.3

*Use estimate with caution
N = 443
Source: Peel Infant Feeding Survey 2017, Region of Peel – Public Health.

Among mothers who introduced solids to their infant prior to six months of age, 21% reported exclusive breastfeeding up until that time point. This was the same as the 2016 results.

The most common purees or solid foods given to babies by mothers who introduced solid foods were (multiple responses possible):

- Fruit (84%)
- Vegetables (84%)
- Infant cereal (78%)
- Meat products (43%)
- Grain products (28%)

At the time of the survey, almost nine in 10 mothers (89%) had given their infant iron-rich foods such as infant cereal, meat products, eggs or legumes. Of these mothers, 65% provided iron-rich foods at least twice daily and 29% provided once daily. These results are similar to the 2016 survey. In 2017, grain products have been removed as iron-rich foods. Since the number of mothers who gave only grain products was small, this change does not affect the comparison of results.

The most common reasons for starting to feed babies purees or solid foods included (multiple responses possible):

- Health professional's advice (38%)
- Mother felt it was time (38%)
- Baby showed interest (25%)
- Baby was hungry (19%)
- Previous children's feeding experience (2%)

The most common reasons for starting to feed babies purees or solid foods in 2017 were similar to the 2016 results.

DISCUSSION

The Region of Peel – Public Health continues to focus on supporting families to achieve their infant feeding goals. The Family Health Division, together with hospital partners, strives to ensure a smooth transition from hospital to home using multiple strategies. In 2017, all public health services had ample capacity to accommodate additional clients.

These strategies include:

- A Public Health Nurse Liaison at each of the three hospital sites, seven days per week, to link clients to infant feeding resources;
- A Breastfeeding Companions Program that offers peer support both in the hospital and community;
- Clinic services (by appointment or walk-in from Monday to Friday, 8:30 am to 4:30 pm) for all families who need breastfeeding technical support;
- Home visits for women who meet specific criteria for breastfeeding support at home; and
- A Multichannel Contact Centre service where a Public Health Nurse can be accessed by telephone, email or Facebook from Monday to Friday, 8:30 am to 4:30 pm.

Breast milk is the optimal source of nutrition for babies and the preferred choice for families. To encourage women to breastfeed as much as possible for as long as possible, providing just-in-time information and technical support are important. The Peel Infant Feeding Survey gathers information on the infant feeding practices of mothers in Peel, monitors the rates of breastfeeding in the region, and helps identify both the challenges parents face and the supports used in the community. The PIFS helps Public Health to determine the extent to which feeding practices of families are in line with public health key messages.

While pregnant, only 80% of mothers intended to offer their baby “breast milk only” during the first four weeks of life. Almost all mothers (98%) reported initiating breastfeeding either in hospital or after discharge. However, about half (45%) of mothers reported their infant was given liquids other than breast milk, primarily formula, in the hospital. Approximately one in four mothers are provided with formula prior to discharge from the hospital to take home, which is down from one in three mothers in 2016. This decrease is likely due to the successful effort by Trillium Health Partners to achieve Baby Friendly Initiative designation in 2018, which requires changes to practices and policies in advance of the designation. Work will continue in this area since providing free formula to mothers contravenes the World Health Organization’s International Code of Marketing of Breast-milk Substitutes and the Baby-Friendly Initiative. [6]

Beginning at discharge from the hospital or midwifery care, the rates of exclusive breastfeeding drastically decline, with only 52% of mothers reporting exclusive breastfeeding at the time of discharge. Despite this continued trend, the percentage of mothers exclusively breastfeeding at six months has remained stable between 2016 (14%) and 2017 (13%).

Similar to the survey results in 2016, the rates of any breastfeeding gradually declined following hospital discharge with 68% of mothers providing any breastfeeding at six months. The most frequent reason for stopping breastfeeding was the perception of not having enough breast milk.

For mothers who breastfed in the hospital, 88% reported receiving support from a professional while in the hospital. However, consistent with the results from 2016, more challenges in receiving breastfeeding support occurred after the mother and baby left the hospital. Almost half (48%) of mothers who attempted to breastfeed reported that they would have benefited from a breastfeeding program or service. Fifteen per cent of these women were not able to use a breastfeeding program or service for reasons such as transportation, postpartum challenges and programs/services not being available when requested. Regarding the location of breastfeeding support, there was an increase in the proportion of mothers receiving breastfeeding help at a home visit by any professional in 2017 compared to 2016 (37% vs. 21%). This may be attributed to the launch of an enhanced home visiting model by the breastfeeding program in February 2015, as well as an additional Public Health Nurse position added in March 2017, which increased the number of home visits being offered. Also, in 2017 compared to 2016, there was a decrease in the proportion of mothers receiving help at the hospital (26% vs. 44%). The reason for this decrease is unclear.

The Family Health Division continues to recommend that all breastfed infants receive a daily vitamin D supplement of 10 µg (400 IU) beginning in the first week of life and continuing until the infant's diet includes at least 10 µg (400 IU) per day of vitamin D from other dietary sources. Most mothers (88%) who had given their infant a vitamin D supplement report that they had done so every day or almost every day.

Current messaging states that solid foods should be introduced to infants at around six months of age when the infant shows signs of readiness. Three out of four infants are being provided with solid foods around the recommended age of six months. However, 25% of infants continue to be offered solid foods either too early (less than five months) or too late (more than seven months); this proportion is consistent with 2016 results. Introducing solid foods too early can impact the amount and duration of breastfeeding as it can affect the mother's milk supply. Furthermore, introducing solid foods too late can affect a child's developmental skills associated with eating textured food as well as can increase the risk of certain nutrient deficiencies (i.e. iron).[4]

The most common reasons for introducing purees or solid foods included health professionals' advice, the mother feeling that it was time, and the baby showing interest or being hungry. The provision of iron-rich foods as the first solid foods offered to infants continues to be high with 89% of mothers offering their baby iron-rich foods first.

In 2017, the rates of breastfeeding initiation and any breastfeeding remained similar to previous years (2015, 2016) while rates of exclusive breastfeeding were similar to 2016. As enhancements continue to be made to breastfeeding services in the community and in public health programming, there remain three key areas for continued improvement:

- Increasing the proportion of women who provide any breast milk to their infant for a longer duration of time;
- Increasing the proportion of women who are predominantly or exclusively breastfeeding at six months; and,
- Increasing the number of parents who introduce solid foods at the right time.

Infant feeding practices continue to be influenced by parental beliefs, inconsistent messages, barriers to accessing services, and current hospital policies.

A strategic direction for the Region of Peel – Public Health is to work with community partners to support mothers in feeding infants, based on their needs and individual infant feeding goals. Along with community partners, Public Health can do this by removing barriers and engaging in continuous quality improvement. This strategic direction is actioned by:

- Continued tailoring of infant feeding programs and services to ensure they are available to all new mothers and their families when and where they need or want them;
- Continued work with Peel hospital partners to support their efforts to achieve Baby-Friendly Initiative designation. This includes the review of infant feeding policies and protocols regarding supplementation and provision of formula; and
- Providing clear and consistent information to parents about infant feeding, including when and how to introduce solid foods.

METHODS

Survey Sampling

Following the birth of an infant, consent is obtained by the hospital nurse or midwife for the mother to be contacted by the Region of Peel – Public Health. Consent was documented using the Healthy Babies Healthy Children (HBHC) Screening Tool. Completed screening tools are faxed to the Region of Peel – Public Health and entered into the provincial Integrated Services for Children Information System (ISCIS) database.

A sample of 1,000 Peel mothers with infants between 26 and 33 weeks of age (six to eight months) on the launch date of the surveying period (April 18, 2017) was selected from the ISCIS database for inclusion in the sampling frame. As the sample of 1,000 was not enough to achieve the target of 455 completed surveys, 200 more records were sampled. These mothers were 26 to 33 weeks of age at the survey launch period (June 16, 2017). In both samples, all teen mothers (aged 15 to 19 years) were selected, along with a random sample of adult mothers (20+ years), all who were residing within one of Peel's three municipalities.

Excluded from the sampling frame were:

- Mothers with known involvement of the Children's Aid Society
- Mothers of a stillborn infant or a live born infant who died

Survey Tool

The survey tool was comprised of 48 questions; eight of these questions were worded differently for mothers who delivered in hospital compared to those who had a home birth. The survey was approximately 15 to 20 minutes in duration and completed using a Computer-Assisted Telephone Interview (CATI) system. Topics included in the survey and described in this report include:

- Birth and Baby
- Breastfeeding Initiation and Support
- Feeding in Hospital
- Feeding at Home (Breastfeeding)
- Hospital Births: Feeding at Home (Other liquids)
- Home Births: Feeding at Home (Other liquids)
- Feeding at Home (Solids)
- Vitamin D Supplementation
- Characteristics of the Mother

Data were collected through a telephone survey conducted by CCI Research Inc. The surveys were administered in the respondent's language of preference through the use of a professional language line. Calls were made during the day and evening, on weekdays and weekends between April 18 and June 27, 2017. At the time the survey was taken, mothers were between 6 to 10 months postpartum.

A standard script was used to describe the survey and to obtain consent to participate. Respondents were informed of their rights as a participant (e.g. to refuse to answer any question, to end their participation at any time).

The majority of mothers in the sample were called until the list was exhausted according to the call specifications (i.e. at least 15 call attempts). Call disposition statistics were collected to capture the number of completed calls and the reasons for non-completion or refusal (where given).

Survey Development

Following the 2016 Peel Infant Feeding Survey completion, minor revisions were made to attain the 2017 survey. These changes are described below:

- Grain products:
    - In 2016, 'grain products' were included in the definition of iron-rich foods.
    - In 2017, 'grain products' were removed, as there is evidence that not all grain products are a reliable source of iron.
- Gripe water:
    - In 2017, 'gripe water' was added to the examples of other liquids that mothers may have given their infants.

These changes are minor and should not affect comparability between years.

- Ethnicity:
    - Updates were made to the question regarding respondents' ethnicity to better align with Statistics Canada's wording. The response option 'West Asian/Arab' was changed to 'West Central Asian/and Middle Eastern', and 'North American' was changed to 'Other North American'.
    - For this question, most response options had examples that were read to the respondent, for instance 'British (e.g. English, Scottish, Irish)'. In the 2017 survey, some examples that previously accompanied response options in the 2016 survey were removed, while others were added. Notably the example 'Egyptian' was moved from the 'West Central Asian/ and Middle Eastern' option to the 'African' option.

Due to these changes, the distribution of respondent ethnicities is reported for 2017 only.

The Region of Peel – Public Health conducted a pre-pilot test of the 2015 survey questions and skip patterns in the Region of Peel Family Health Division in March 2015. Prior to each survey cycle, CCI Research Inc. tested the survey tool using the CATI System. Minor revisions to the survey instrument were considered following the results of these tests.

Analysis and Reporting

Descriptive statistics of estimates (proportions) and confidence intervals are presented in this report. Respondents to the Peel Infant Feeding Survey were compared to non-respondents using chi-square tests (categorical variables) and t-tests (continuous variables) based on mother's municipality of residence, mother's age, gestational age, infant sex, infant birth weight, type of birth, feeding method at discharge and delivery method. A *p-value* of less than 0.05 was considered statistically significant.

Analysis was computed using the svy procedure in Stata 15.1. Data presented in this report have been weighted using design weights based on age category of mothers (e.g. teen mothers, adult mothers). The weighting was done to account for the probability of selection for each respondent and was adjusted for non-response. The final design weight was the product of the probability of being sampled and the non-response adjustment factor (the proportion of respondents out of the eligible sample of respondents). Of note, it was not possible to calculate a 2016 survey weight for teen mothers, due to a lack of respondents. However, the svy procedure was still applied by assigning the same weight to all respondents, allowing for standard error estimates. Data describing respondent characteristics of the sample (Table 2, Table A1) are unweighted.

In this report, data are presented where the numerator is 10 or more and the denominator is 30 or more. Any data with values less than this numerator or denominator were suppressed and labelled as not releasable due to small numbers. The coefficient of variation (CV) was also computed to determine the releasability of survey estimates. Estimates with a CV of 0.0-16.5 were releasable, estimates with CVs falling within 16.6-33.3 were released with caution and estimates with CV greater than or equal to 33.4 were labelled not releasable due to small numbers. Additionally, if the proportion of missing responses for a question was five per cent or greater, cases with missing responses were kept in the analysis. If the proportion of missing responses for a question was less than five per cent, cases with missing responses were excluded from the analysis. Instances where the missing responses were included in the analysis are noted in the text, tables or figures.

LIMITATIONS

There are several limitations to the Peel Infant Feeding Survey and analysis presented in this report:

- The sampling frame from ISCIS does not include all births in Peel because not all women consent to have their data collected through ISCIS. It is possible that the 10% of births not captured in ISCIS are systematically different than the births that are included in the database.
- PIFS was developed to have a sufficient sample to provide a precise estimate of the rate of exclusive breastfeeding at six months postpartum. However, the PIFS is insufficiently powered to detect differences between subgroups (e.g. age group, immigrant status, income).
- Due to the small number of teen mothers surveyed and the releasability guidelines for the PIFS (required denominator of at least 30 individuals), the PIFS sample does not allow for the reporting of breastfeeding practices among teen mothers (15 to 19 years) at this point in time.

- Due to differences in sampling methodology, data from the 2017, 2016 and 2015 PIFS should not be compared with previous infant feeding reports by Region of Peel – Public Health (i.e. 2004/2005, 2009/2010) where convenience sampling was used.
- In addition, some questions have changed and may be asked differently from the 2012/2013 Infant Feeding Surveillance System Summary Report. When making comparisons between 2017 PIFS data (as well as 2015 and 2016) and 2012/2013 data, caution should be taken to ensure questions are comparable. Differences in weighting methods between 2012/2013, 2015, 2016 and 2017 analyses will not have significant impact on the proportions presented; however, they will provide additional precision to the estimates.

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APPENDIX 1: Supplemental Tables

Table A1
Demographic Characteristics of Adult Respondents,
Peel, 2015 – 2017

Characteristic	2017 Number	2017 Per cent	2016 Per cent	2015 Per cent
Municipality				
Brampton	240	52.5	52.8	51.0
Caledon	16	3.5	4.2	4.8
Mississauga	201	44.0	43.1	44.2
Maternal Age Group (years)*				
15-24	15	3.3	4.8	18.5
25-29	105	23.0	25.9	37.1
30-34	191	41.8	43.3	35.8
35-39	121	26.5	21.3	6.4
40+	25	5.5	4.6	2.2
Respondent's First Child				
Yes	260	57.0	45.5	46.0
No	196	43.0	54.5	54.0
Breastfed Previous Children	(n=260)			
Yes, some of them	24	9.2	7.7	4.5
Yes, all of them	213	81.9	83.9	86.1
No	23	8.9	8.5	9.4
Sex of Infant				
Female	217	47.5	50.8	45.8
Male	240	52.5	49.2	54.2
Type of Birth				
Single	452	98.9	97.1	97.1
Multiples	NR	NR	2.9	2.9
Delivery Type				
Caesarean Section	139	30.5	30.2	31.0
Vaginal	317	69.5	69.8	69.0
Planned Caesarean Section	(n=139)			
Yes	75	54.0	59.1	46.8
No	64	46.0	40.9	53.2
Attended Prenatal Classes				
Yes	127	28.0	26.3	27.0
No	326	72.0	73.7	73.0

Table A1
Demographic Characteristics of Adult Respondents continued

Characteristic	2017 Number	2017 Per cent	2016 Per cent	2015 Per cent
Birth Location				
William Osler Health System – Brampton Civic Hospital	159	34.9	35.1	33.2
William Osler Health System – Etobicoke General Hospital	17	3.7	5.7	5.5
Trillium Health Partners – Mississauga Hospital	82	18.0	17.7	18.9
Trillium Health Partners – Credit Valley Hospital	137	30.0	30.7	30.3
Other, including home birth	61	13.3	10.8	12.1
Infants' Length of Stay in Hospital				
Less than 1 day (Less than 24 hours)	11	2.4	NR	3.3
1 day (24 to 47 hours)	204	44.7	44.7	41.5
2 days (48 to 71 hours)	136	29.8	28.5	30.1
3 days (72 to 95 hours)	43	9.4	11.1	13.2
4 days or more (96 hours or more)	62	13.6	13.7	11.9
Marital Status				
Married (legally)	376	82.3	81.1	80.7
Common-law or living with a partner	35	7.7	9.7	9.9
Single (never married)	32	7.0	7.9	8.6
Separated / Divorced / Widowed	14	3.1	NR	NR
Education				
High school or less	69	15.1	18.5	16.3
Some post-secondary	34	7.4	7.7	8.1
Post-secondary graduate	354	77.5	73.8	75.6
Household Income Before Taxes				
Less than $50,000	149	32.6	35.8	33.0
$50,000 to less than $80,000	57	12.5	15.6	16.0
$80,000 or more	170	37.2	31.4	33.2
Don't Know	41	9.0	8.6	9.0
Refused	40	8.8	8.6	8.8
Gestational Age				
<37 weeks (preterm)	30	6.6	9.1	8.1
37 weeks or greater (term)	424	93.4	90.9	91.9
Mother born in Canada				
Yes	141	30.9	34.8	36.7
No	316	69.2	65.2	63.3

Table A1
Demographic Characteristics of Adult Respondents continued

Characteristic	2017 Number	2017 Per cent	2016 Per cent	2015 Per cent
Length of Time in Canada				
Non-immigrant	141	30.9	35.0	37.0
Recent (0 to 5 years)	114	25.0	22.6	20.8
Intermediate (6 to 10 years)	72	15.8	18.2	15.3
Long term (11 years or more)	129	28.3	24.2	26.8
Ethnic Origins				
Other North American (e.g. Canadian, American)	41	7.4	NA-Cannot compare between years due to changes in question wording	
British (e.g. English, Scottish, Irish)	49	8.8		
South Asian (e.g. East Indian, Pakistani, Sri Lankan, Punjabi)	166	29.9		
Caribbean (e.g. Jamaican, Trinidadian, West Indian)	43	7.7		
African (e.g. Egyptian, Ghanaian, Nigerian, South African)	40	7.2		
European (e.g. Italian, Portuguese, Polish, French, Greek)	98	17.6		
East or South East Asian (e.g. Chinese, Filipino, Vietnamese, Korean)	58	10.4		
West Central Asian / and Middle Eastern (e.g. Iranian, Lebanese, Iraqi, Afghan)	28	5.0		
Latin, Central and South American (e.g. Guyanese, Columbian, Ecuadorian, Salvadorean)	25	4.5		
First Nations, Inuit and Métis	NR	NR		

N=457
*Proportion of characteristics is significantly different between years.
NR – Not releasable due to small numbers
Source: Peel Infant Feeding Survey 2015 – 2017, Region of Peel – Public Health.

Table A2
Comparison of Characteristics of Adult Respondents to Non-Respondents*, Peel, 2017

Characteristic	Respondents Per cent (n=457)	Non-respondents Per cent (n=743)	p-value
Municipality			0.49
Brampton	52.5	49.3	
Caledon	3.5	3.2	
Mississauga	44.0	47.5	
Mother's Age (years)			0.0003
Mean	32.3	31.3	
Gestational Age Group (singletons only)			0.31
<37 weeks (preterm)	6.6	8.2	
37 weeks or greater (term)	93.4	91.8	
Sex of Infant**			0.78
Female	49.8	50.6	
Male	50.2	49.4	
Infant Birth Weight (grams)			0.67
Mean	3,228.0	3,242.2	
Type of Birth			0.57
Single	98.9	98.5	
Multiple	NR	1.5	
Feeding Method at Discharge			0.24
Breast Milk	49.2	46.3	
Breast Milk Substitute	3.5	3.5	
Both	18.2	23.2	
Missing	29.1	27.1	
Delivery Method**			0.99
Caesarean Section	28.9	28.5	
Vaginal	63.0	63.4	
Missing	8.1	8.1	

*Non-respondents include other call types (n=39) (answering machine, those who requested a call back, hung up, line busy, no answer, partial complete of survey or language barrier), refused or removed their number (n=126), were ineligible (n=39), not in service (152), invalid telephone number (6), or were not reached before the maximum number of call attempts (281) or the target number of completed surveys was reached before they were contacted (n=100).
**Proportion of respondents differs compared to variables in Appendix Table A1 due to a different data source being used.
Source: Integrated Services for Children Information System (ISCIS), 2017, Region of Peel – Public Health.

Table A3
Any Breastfeeding Duration by Formula Received from Hospital at Discharge Status, Peel, 2017

Breastfeeding duration	Did not receive formula to take home	Received formula to take home
	Per cent (95% CI)	Per cent (95% CI)
Two weeks	96.0 (93.4 – 97.6)	91.8 (84.4 – 95.8)
1 month	94.9 (92.0 – 96.8)	88.7 (80.7 – 93.6)
2 months	90.7 (87.1 – 93.3)	83.5 (74.7 – 89.7)
3 months	86.7 (82.7 – 89.9)	77.3 (67.9 – 84.6)
4 months	81.6 (77.2 – 85.3)	71.1 (61.3 – 79.3)
5 months	75.4 (70.6 – 79.6)	67.0 (57.1 – 75.7)
6 months or longer	70.0 (65.0 – 74.6)	62.9 (52.9 – 71.9)

CI – Confidence Interval
Source: Peel Infant Feeding Survey 2017, Region of Peel – Public Health.