



Infant Feeding Surveillance System

Focused Report on...

Introduction of Liquids and Solids

February 2017

Highlights

- Formula and baby cereals are the most commonly introduced liquid and solid food in the first six months. A large proportion of babies were introduced to formula (81%) and baby cereal (75%) before they reached six months of age. Other liquids and solids commonly introduced in the first six months included water (47%), fruit/vegetables (45%), sugar water (15%), grain products (14%) and juice (11%).
- Two weeks and four months postpartum are important time periods for intervention as liquids and solids were most likely to be introduced during these stages. Formula and sugar water were more likely to be introduced to babies during the first two weeks; baby cereal, vegetables/fruits and water were more likely to be introduced when babies were between four and five months old.
- Formula and sugar water had a large impact on exclusive breastfeeding rates as they were more likely to be introduced during the first two weeks.
- Introduction of liquids and solids is closely related to mothers' socioeconomic status. Introduction rates for both water and solids were higher among younger mothers, those with a lower education level and lower household income.
- The most commonly reported reasons for introducing:
 - Formula - concerns about breast milk supply
 - Solids - perception that babies were ready for solids

Introduction

Breastfeeding is the optimal method of feeding infants. Its benefits for general health, growth and development are well documented¹⁻⁴. Human milk lowers an infant's risk for a large number of acute and chronic diseases in childhood such as acute otitis media, non-specific gastroenteritis, severe lower tract respiratory infections, asthma, leukemia, sudden infant death syndrome and necrotizing enterocolitis⁵. Breastfeeding also contributes to women's health as it can reduce the risk of type 2 diabetes, breast cancer and ovarian cancer⁵.

The World Health Organization (WHO) supports and promotes exclusive breastfeeding for the first six months postpartum, with the introduction of complementary foods while breastfeeding for up to two years of age and beyond¹. In 2004, Health Canada changed its recommendations to align with the WHO and now recommends exclusive breastfeeding for the first six months (rather than four months) with the introduction of nutrient-rich, solid foods with particular attention to iron at six months². Delaying the introduction of other liquids and solids until six months does not impact growth rates nor iron status for healthy term infants and provides additional protection against gastrointestinal infections⁶.

Exclusive breastfeeding for six months continues to be the target for the implementation of the Baby-Friendly Initiative (BFI) and Global Strategy for Infant and Young Child Feeding (WHO, 2003)⁸. However, in individual practice, guidance on the appropriate time to introduce complementary foods should also be led by the infant's signs of readiness and may be a few weeks before or just after the sixth month. The national Infant Feeding Joint Working Group, a collaboration between Health Canada and a few other national organizations currently recommends parents look for babies' signs of physiological and development readiness for solids and liquids introduction by about six months of age⁹.

From September 2006 to July 2016, 6,328 new mothers in Durham Region completed the infant feeding survey at six to seven months postpartum. Most clients (93%) initiated breastfeeding and 54% were still breastfeeding at six months. However, only 6% were exclusively breastfeeding at six months.

This report examines the introduction of liquids and solids before six months, reasons for introducing liquids and solids, as well as the related socioeconomic factors among babies introduced breastmilk. The information will support the work of the Reproductive and Child Health program of Durham Region Health Department (DRHD) by: increasing awareness of infant feeding practices in Durham Region; identifying priority populations; and assisting in designing programs aimed at improving any breastfeeding and exclusive breastfeeding rates.

Data Source

Data was collected through the Durham Region IFSS developed and implemented by the DRHD. The IFSS was launched in 2007 to regularly assess infant feeding practices of Durham Region mothers. It contains data for live born infants, including multiple births, preterm and low birth weight infants. The survey is only asked for the first born for mothers with multiple births.

From 2006 to 2008, IFSS data were collected in two phases. In Phase I, demographic information and breastfeeding initiation rate were extracted from a pre-existing health assessment conducted through the Healthy Babies Healthy Children (HBHC) program. The HBHC assessment usually occurred within 48 hours of hospital discharge. Phase I was used as the sampling frame for Phase II, a telephone survey developed for the IFSS and conducted at six to seven months postpartum.

In 2008, record level data, including demographic information, became available from the Integrated Services for Children Information System (ISCIS). Because ISCIS provides a more complete account of number of births, eligible mothers were selected from the ISCIS database from 2009 onward. Income, education and country of birth were collected from mothers of infants born in July 2007 and later.

This report was based on the analysis of 6,328 IFSS records for mothers who gave birth between March 2006 and December 2015. Mothers under 15 years old were excluded from the analysis. Surveys were conducted at six to seven months postpartum, which was between September 2006 and July 2016. Birth years, instead of years when surveys were conducted were presented in this report.

For more information on the IFSS development and other IFSS reports please refer to

http://www.durham.ca/departments/health/health_statistics/IFSSSevalReport.pdf

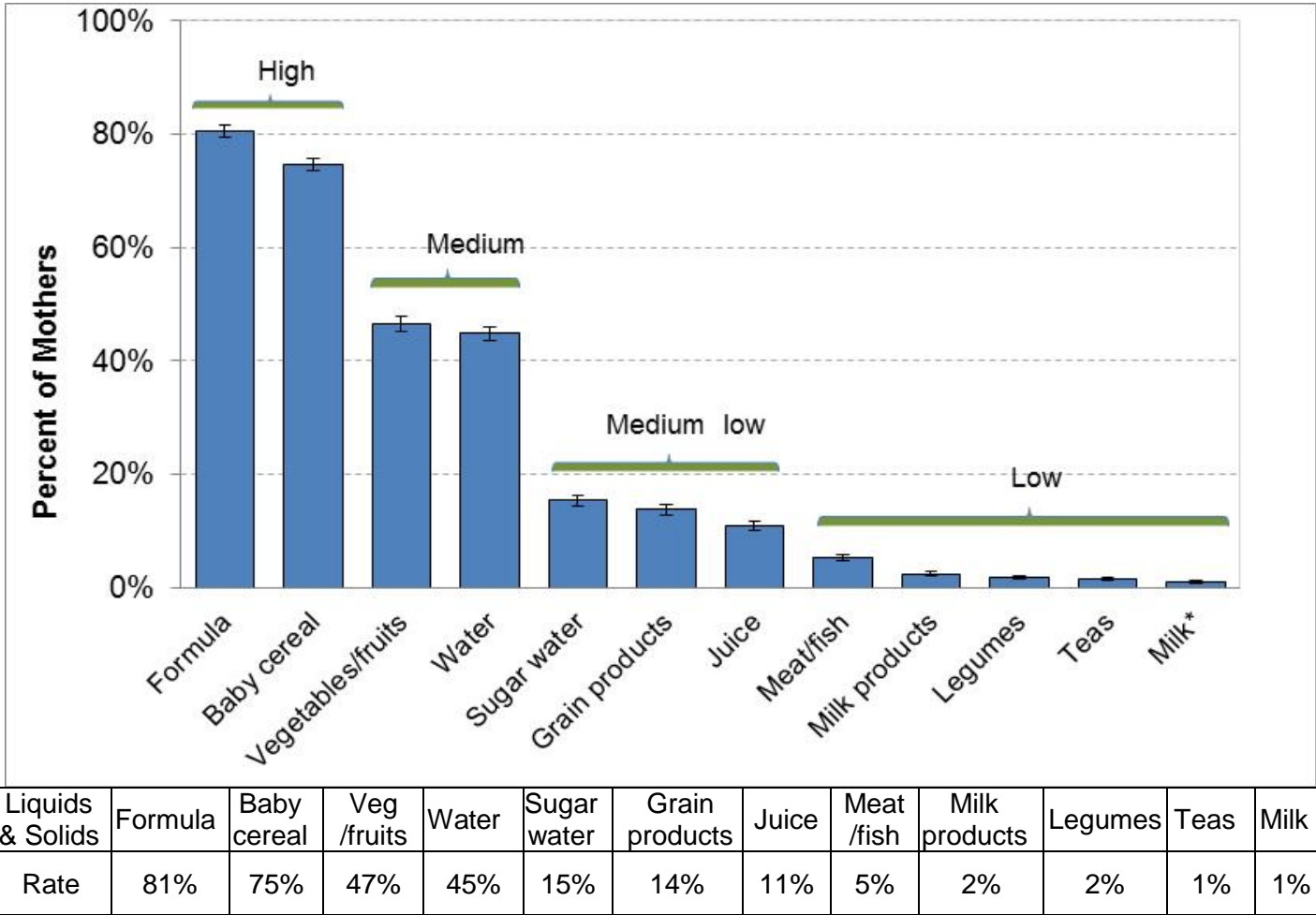
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Introduction of Liquids and Solids before Six Months

Mothers were surveyed to determine if any liquids other than breastmilk or solids had ever been offered to their infants during the first six months after birth. Liquids and solids were divided into four groups according to their rate of introduction before six months (Figure 1):

- **High:** Formula and baby cereal (80%): about 80% of babies were introduced to formula or baby cereal
- **Medium:** Water and vegetables/fruits (50%)
- **Medium low:** Sugar water, grain products, and juice (11-15%)
- **Low:** All other liquids and solids (5%)

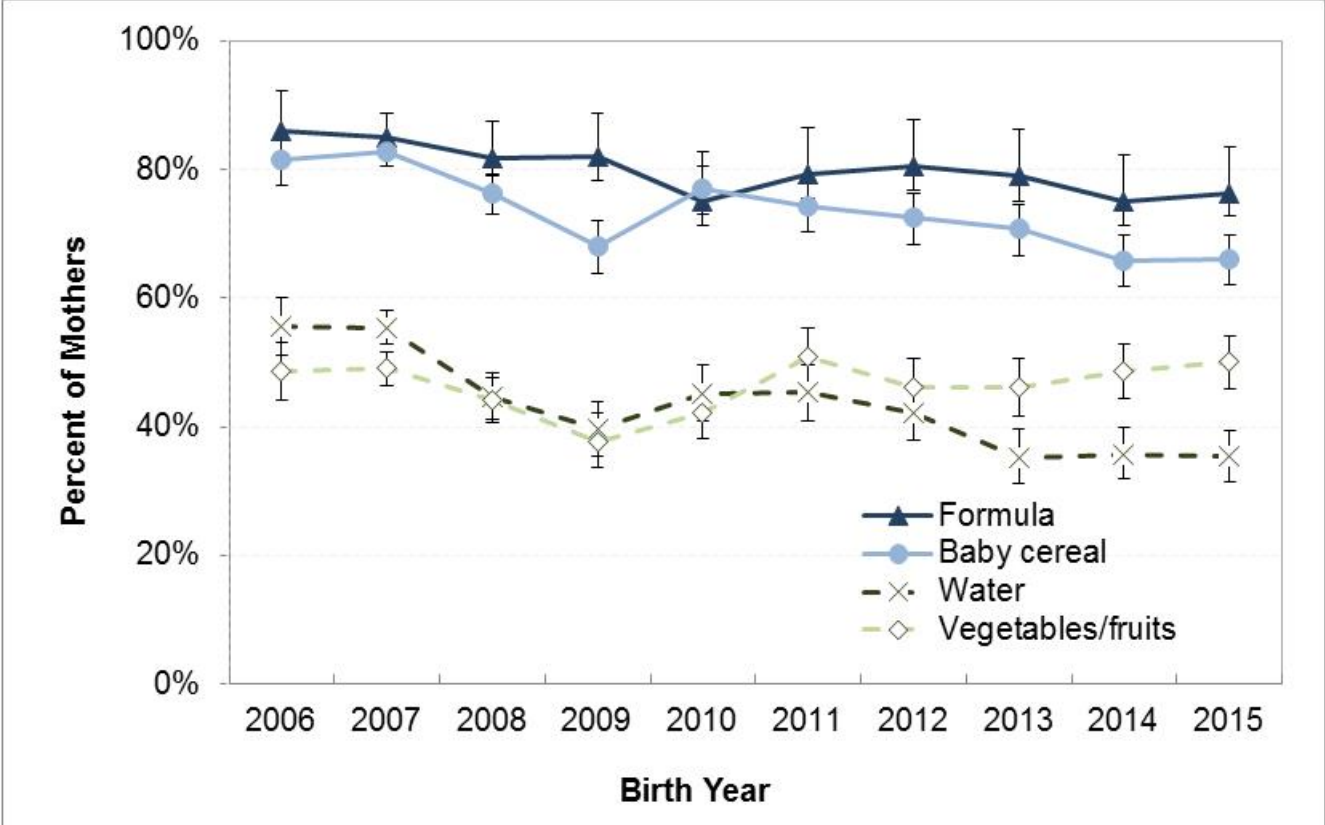
Figure 1: Types of Liquids and Solids Introduced before Six Months, Durham Region IFSS, 2006-2015 Combined



*: Milk such as cow’s milk, goat’s milk, soy milk, rice milk

Formula, baby cereal, water and vegetables/fruits were the most commonly introduced liquids and solids before six months. Introduction rates of both formula and vegetables/fruits were relatively stable over time with a slight decrease in 2010 for formula, and a decrease in 2009-2010 for vegetables/fruits. Introduction rates for both baby cereal and water fluctuated, but overall rates decreased over time (Figure 2).

Figure 2: The Most Commonly Introduced Liquids and Solids before Six Months by Birth Years, Durham Region IFSS, 2006-2015

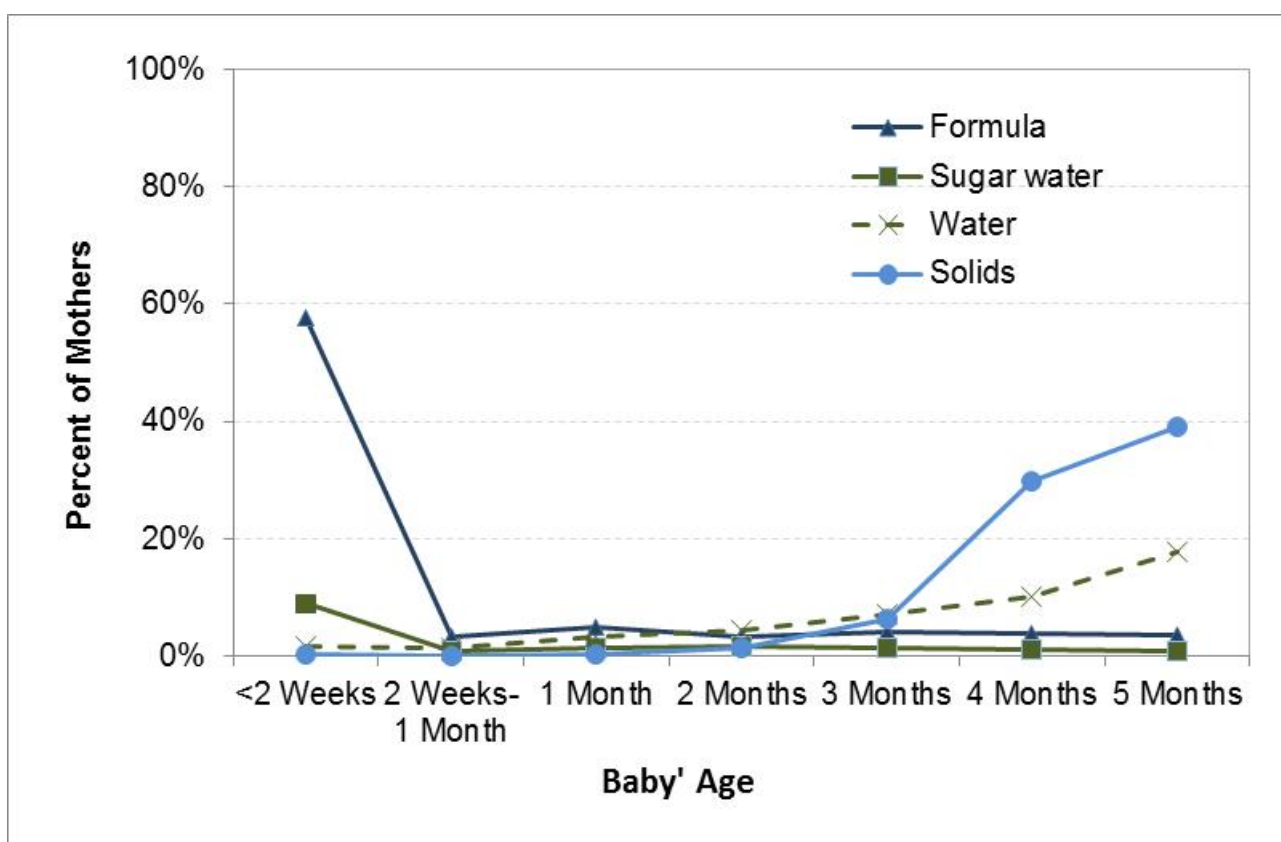


Indicators	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Formula	86%	85%	82%	82%	75%	79%	81%	79%	75%	76%
Baby cereal	81%	83%	76%	68%	77%	74%	72%	71%	66%	66%
Water	56%	55%	45%	40%	45%	45%	42%	35%	36%	35%
Vegetables/fruits	49%	49%	44%	38%	42%	51%	46%	46%	49%	50%

Figure 3 shows introduction to liquids and solids by baby's age before six months. Formula and sugar water were most commonly introduced during the first two weeks, especially in the first few days in hospital. During the first two weeks, 58% of babies were introduced to formula and almost all of them (96%) were introduced in hospital¹⁰. Nine percent of babies were introduced to sugar water during the first two weeks. Of that 9%, 90% received sugar water in hospital mostly due to pain management and medical procedure such as circumcision. As formula and sugar water were more frequently introduced during the first two weeks, their introduction had a large impact on the exclusive breastfeeding rate.

Introduction of various liquids and solids dramatically decreased between two weeks and three months, and then significantly increased at four months for water and various solids. The highest introduction rates for both water and solids were found when babies were between four and less than six months old. The results indicate that two weeks, four and five months postpartum are critical time periods for intervention.

Figure 3: The Most Commonly Introduced Liquids and Solids before Six Months by Baby's Age, Durham Region IFSS, 2006-2015 Combined



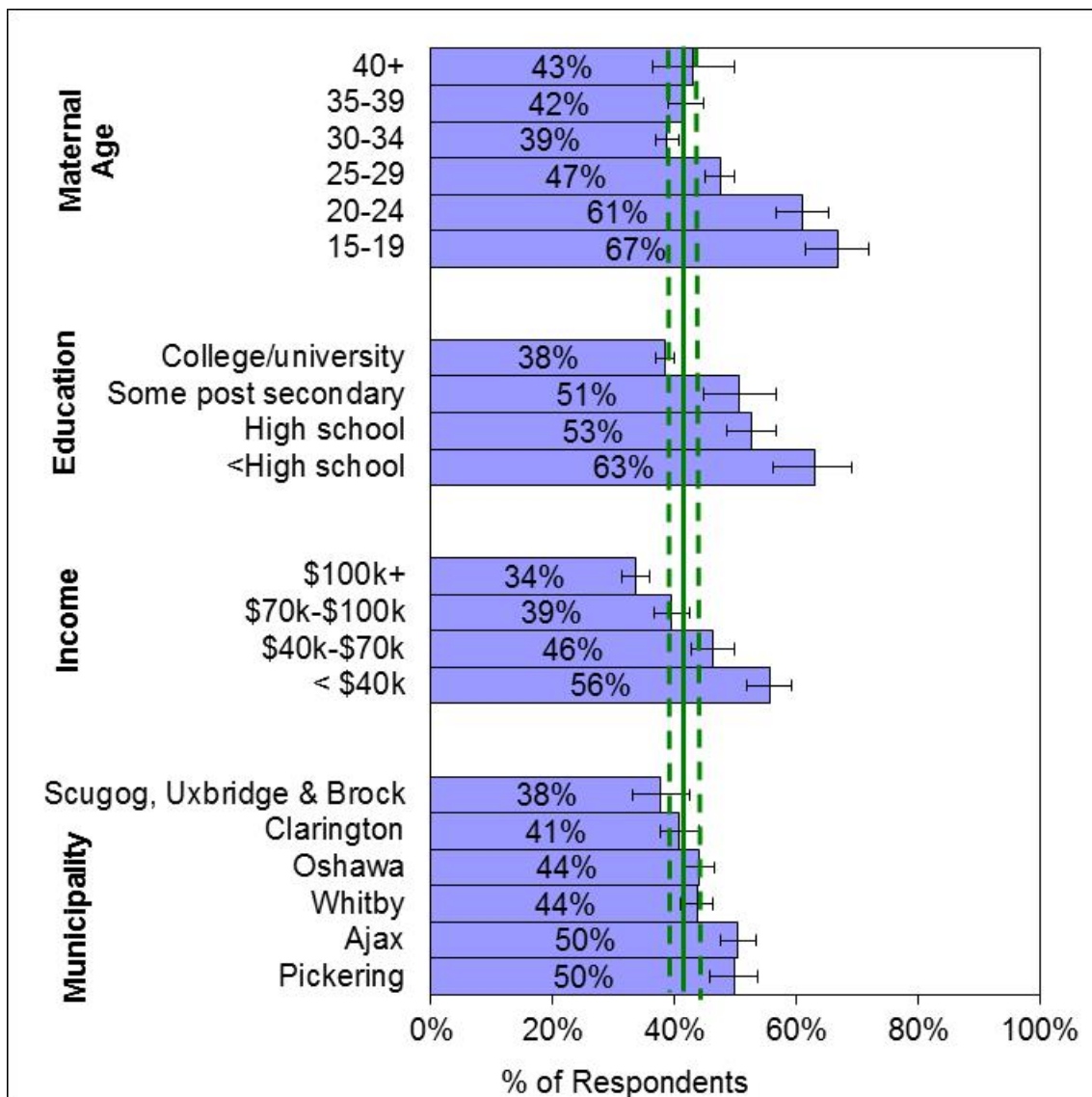
Indicators	<2 Weeks	2 Weeks-1 Month	1 Month	2 Months	3 Months	4 Months	5 Months
Formula	58%	3%	5%	3%	4%	4%	3%
Sugar water	9%	1%	1%	2%	1%	1%	1%
Water	2%	1%	3%	4%	7%	10%	18%
Solids	<1%	<1%	<1%	1%	6%	30%	39%

: Highest introduction rates for introducing liquids or solids by babies' age

Water and Solids Introduction before Six Months by Socioeconomic Status

Introduction rates for water and solids before six months were also compared among groups with different socioeconomic status. The association between the introduction of water before six months and socioeconomic status was statistically significant for: maternal age, education, household income and municipality of residence. Introduction to solids was associated with those factors with the exception of municipality of residence. Introduction rates for both water and solids were higher among younger mothers, those with lower education levels and lower household income (Figure 4 and 5). The associations between formula introduction and socioeconomic status have been examined in a previous IFSS report and similar results were found⁷.

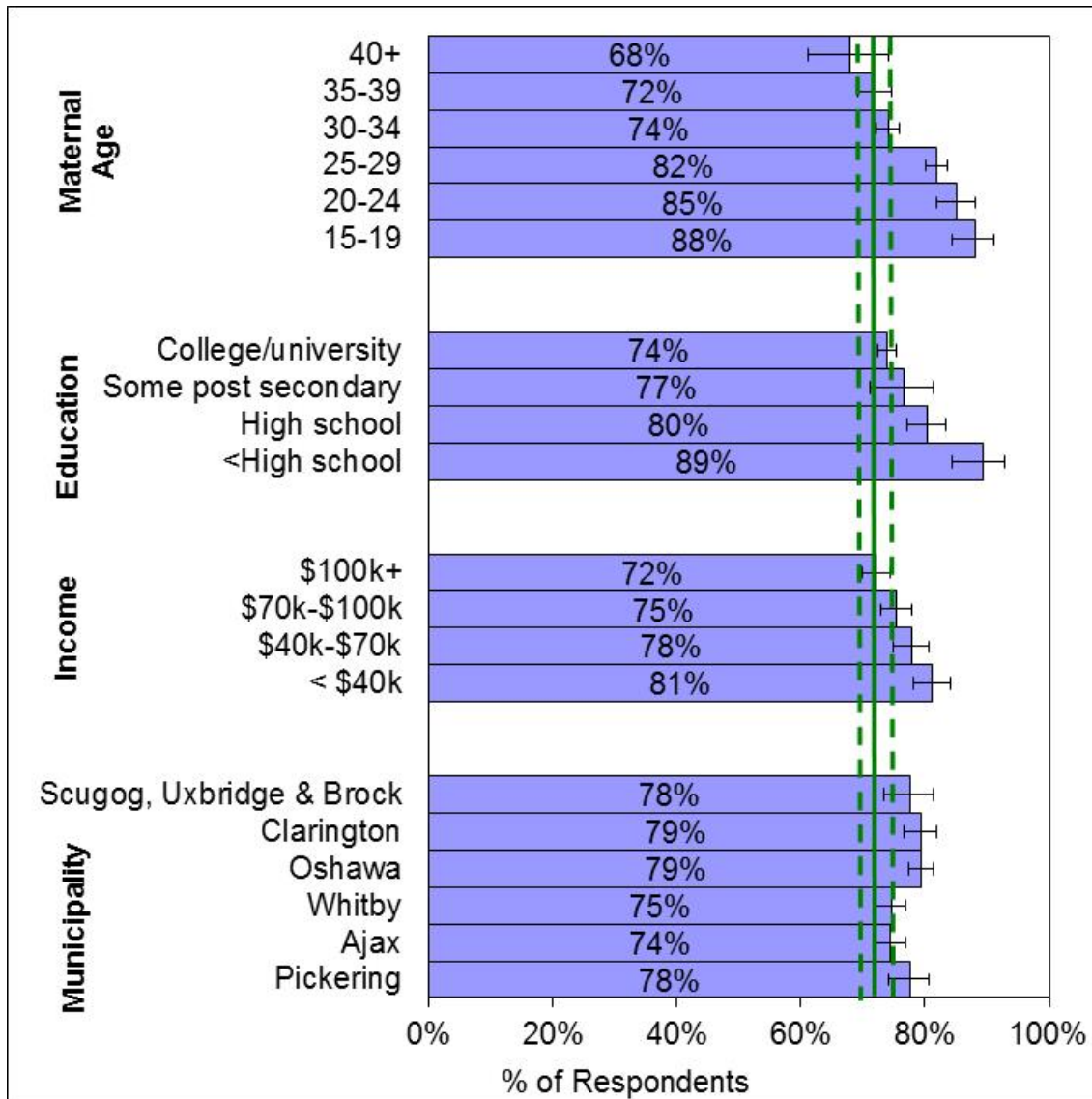
Figure 4: Water Introduction before Six Months by Socioeconomic Status, Durham Region IFSS, 2007*-2015 Combined



*: Include July 2007 - December 2015 birth years as socioeconomic status questions were added in Jan. 2008.

— : Durham Region Average
 - - - : Upper and Lower 95% CI

Figure 5: Solid Introduction before Six Months by Socioeconomic Status, Durham Region IFSS, 2007*-2015 Combined



*: Include July 2007 - December 2015 birth years as socioeconomic status questions were added in Jan. 2008.

— : Durham Region Average
 - - : Upper and Lower 95% CI

Reasons for Introducing Liquids and Solids

Infant formula was the most common item introduced before six months, especially during the first two weeks postpartum. Concerns about breastmilk supply were the most common reason for introduction, reported by 30% of mothers whose babies were introduced to formula. Other common reasons for introducing formula included: mother's or baby's medical issues (10%); and latching difficulties (9%). The most common reasons for introducing solids before six months were:

- Parents felt the baby was ready for solids (reported by 28% of mothers whose babies were introduced to solids).
- Advice of health professionals (25%)
- Parents' general knowledge (23%)
- Parents' concerns about breastmilk supply (19%).

The most common reasons for introducing solids according to infant age were:

- **Two weeks to two months – parents' concern about breastmilk supply.** This reason was reported by 42% of the parents whose babies were introduced formula between two weeks and two months postpartum. This finding suggests that two weeks postpartum is an important time to support breastfeeding mothers regarding concerns about milk supply.
- **Four to five months – advice of health professionals.** This was reported by 28% of the parents whose babies were introduced formula during this time period. The findings support the need to provide health care professionals the most current breastfeeding information available so they can give optimal guidance to breastfeeding mothers.
- **Five to six months – parents' perception that baby was ready for solids,** reported by 32% of the parents whose babies were introduced formula during this time period. Since many of the developmental signs of readiness do not appear in infants until closer to six months, these results support the need for further education to parents to encourage them to delay the introduction of solids until closer to six months and when the signs of developmental readiness are present.

Although exclusive breastfeeding for six months continues to be the goal, the Infant Feeding Joint Working Group, a collaboration between Health Canada and other national organizations, also recognizes the importance of sign of readiness⁹. Its recommendation is for parents to look for babies' signs of physiological and development readiness for solids and liquids introduction by about six month of age. Babies' signs of readiness may be a few weeks before or just after the sixth months. "Ready for solids" suggests parental perception of developmental readiness. For some, the introduction of solids at this time may be based on the infant's stage of readiness, which is consistent with the recommendations from the Infant Feeding Joint Working Group.

What is Durham Region Health Department Doing to Support Positive Infant Feeding Practices?

The DRHD promotes positive infant feeding practices as one means of supporting healthy child development in Durham Region. It uses communication, education, capacity building, surveillance and policy development strategies to achieve this goal. DRHD offers a variety of programs and resources to protect, promote, and support breastfeeding, and educate parents and caregivers about feeding solid foods to babies. They include:

- Prenatal programs and breastfeeding resources to increase awareness and knowledge about the importance of breastfeeding.
- Breastfeeding clinic appointments to provide health education and to increase mothers' confidence for families experiencing complex breastfeeding issues.
- Telephone counselling, new mother support groups and breastfeeding home visits to provide support and address breastfeeding concerns.
- Breastfeeding groups to enable new mothers to support and learn from one another, and to increase breastfeeding duration through mutual aid.
- The regular collection and analysis of local infant feeding data to increase awareness of infant feeding practices in Durham Region, to identify priority populations and to assist in designing programs aimed at improving breastfeeding rates.

In June 2015, DRHD was awarded designation as a "Baby Friendly Community Health Service" from the Breastfeeding Committee for Canada (BCC). BCC is the national authority responsible for the Baby Friendly Initiative (BFI). BFI is a worldwide, evidence-based strategy developed by the WHO and the United Nations Children's Fund (UNICEF). Established to protect, promote and support breastfeeding, it helps to ensure that all families, regardless of their feeding method, are supported in feeding their children in safe and nurturing ways.

Finally, DRHD works with community partners, hospitals, health care providers and coalitions to achieve the common goals related to supporting optimal infant feeding practices and delivering a consistent, coordinated message to new mothers throughout Durham Region.

References

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- **95% Confidence Interval (CI):** The error bar (|) at the top of each bar in graphs represents the 95% confidence interval. If independent samples are taken repeatedly from the same population, and a confidence interval is calculated for each sample, then 95% of the intervals will include the unknown population parameter (the true value). For example, if a survey on breastfeeding is repeated 100 times and the CI is computed each time for the current breastfeeding rate, 95 of the 100 intervals would contain the current breastfeeding rate for the population from which the survey sample is drawn. A wide confidence interval reflects a large amount of variability or imprecision. Usually, the larger the sample size, the narrower the confidence intervals.
- **Coefficient of Variation (CV)** refers to the precision of the estimate. When a CV is between 16.6% and 33.3%, the estimate should be interpreted with caution because of high variability. An estimate with a CV of 33.3% or more is not releasable.



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