

Uptake of Ontario's Enhanced 18-Month Well-Baby Visit

An AHRQ Report

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Authors

Astrid Guttman
John Cairney
Karen MacCon
Matthew Kumar

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INSTITUTE FOR CLINICAL EVALUATIVE SCIENCES

G1 06, 2075 Bayview Avenue

Toronto, ON M4N 3M5

Telephone: 416-480-4055

Email: communications@ices.on.ca

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Authors' Affiliations

Astrid Guttmann, MDCM, MSc, FRCP(C)

*Chief Science Officer and Senior Core Scientist, Institute for Clinical Evaluative Sciences
Staff Paediatrician, Division of Paediatric Medicine, Hospital for Sick Children
Associate Professor, Institute of Health Policy, Management and Evaluation, University of Toronto*

John Cairney, PhD

*Professor, Child Health Research, Family Medicine, McMaster University
Director, Infant and Child Health (INCH) Lab, McMaster University
Core Member, Offord Centre for Child Studies & the CanChild Centre for Childhood Disability Research
Adjunct Scientist, Institute for Clinical Evaluative Sciences*

Karen MacCon, PhD

Epidemiologist, Institute for Clinical Evaluative Sciences

Matthew Kumar, MSc

Analyst, Institute for Clinical Evaluative Sciences

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About ICES

The Institute for Clinical Evaluative Sciences (ICES) is an independent, non-profit organization that produces knowledge to enhance the effectiveness of health care for Ontarians. Internationally recognized for its innovative use of population-based health information, ICES evidence supports health policy development and guides changes to the organization and delivery of health care services.

Key to ICES' work is its ability to link population-based health information, at the patient level, in a way that ensures the privacy and confidentiality of personal health information. Linked databases reflecting 13 million of 34 million Canadians allow researchers to follow patient populations through diagnosis and treatment, and to evaluate outcomes.

ICES receives core funding from the Ontario Ministry of Health and Long-Term Care. In addition, ICES scientists and staff compete for peer-reviewed grants from federal funding agencies, such as the Canadian Institutes of Health Research, and project-specific funds from provincial and national organizations. These combined sources enable ICES to have a large number of projects underway, covering a broad range of topics. The knowledge that arises from these efforts is always produced independently of funding bodies, which is critical to ICES' success as Ontario's objective, credible source of evidence guiding health care.

List of Exhibits

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Executive Summary

Issue

Ontario is the first province in Canada to fund a primary care visit with tools to support a standardized developmental review and evaluation at 18 months for each child in the province.^{1,2} This visit is widely acknowledged to be the critical point at which to determine the developmental progress of an infant/child. This report analyzes the uptake of this visit since inception, provides updated data to the [preliminary evaluation of the 18-month enhanced well-baby visit \(EWBV\)](#) published in June 2011¹, and examines child, family and provider characteristics associated with completion of the EWBV.

Study

Using linked health administrative and demographic data, eligible children and their primary care providers for the EWBV were identified. We describe uptake of the visit by region and primary care practice setting, as well as child and primary care provider characteristics.

Key Findings

- Although proportions of children receiving an EWBV have increased since the first year of implementation, less than half of all eligible children in Ontario have received the visit. Uptake of the EWBV is lowest in Northern Ontario.
- Lower proportions of children who live in socially vulnerable families (defined as those who live in low income neighbourhoods, have mothers who were younger than 19 years of age at first pregnancy, or were refugees to Canada) received an EWBV than children who do not live in socially vulnerable families.
- Higher proportions of children who receive primary care from paediatricians (59.6%) or from family physicians working within a Family Health Team (43.1%) received an EWBV, compared to children who receive primary care from clinicians in other settings.
- Primary care physicians who are female, in practice for fewer than 10 years and who are Canadian-trained are more likely to provide EWBVs.
- Children with known or suspected developmental disorders are more likely to have received an EWBV.

Implications

Although the 18-month EWBV is intended to be a universal program, less than half of eligible children are receiving the visit three years post-implementation. The results of this study can be used to inform future programming targeted to specific families and primary care providers, in order to increase visit rates among these groups.

Background

A compelling case for the importance of promoting healthy development in early childhood has been made, based on the accrual of evidence from a broad range of medical, neuropsychological, and population-based research studies.^{3,4} Collectively, this research supports the need for early identification, treatment and support for children showing early signs of developmental problems, in order to eliminate or reduce the likelihood of poor developmental outcomes.

Estimates of the prevalence of meaningful developmental delay in children range from 13-15%.⁵ The prevalence of children showing significant delay in one or more area of development (cognitive, motor, language or emotional-behavioural) far exceeds the number of children referred for developmental services or who are receiving care for a developmental issue. This discrepancy led to a call for a routine, standardized screening assessment at well-child visits when there is concern that a child has, or is at risk for, developmental delay.⁶

In Canada, the case for universal screening is based on the premise that all children can benefit from interventions that target optimal development through parenting and health promotion.^{7,8} The 18-month check-up has been recommended as a unique opportunity for universal screening because it occurs at a time when families are likely to be experiencing critical developmental challenges related to behaviour and health (e.g., eating, sleep patterns)⁶. Moreover, for many children, the 18-month visit may be the last visit with a primary care provider before entry to school. However, assessing development, especially in relation to early identification of developmental delay, is challenging. Many early signs (particularly those that are behavioural, emotional or cognitive) are subtle or are masked by the naturally high degree of variability in achievement of developmental milestones. Despite conflicting evidence and the inherent challenges associated with assessment and screening in the early developmental period, there is widespread opinion that developmental screening, monitoring and surveillance is a necessary means to achieving a healthy society.^{9,10}

In October 2009, the Ontario Ministry of Health and Long Term Care introduced new fee codes as an incentive for primary care physicians to conduct the 18-month enhanced well-baby visit (EWBV). The enhancement of the visit represents a shift from a basic well-baby check-up to a pivotal assessment of developmental health. It includes the use of standardized tools and encourages broader discussion between the physician and caregiver on child development, parenting, early literacy, and the importance of attending local community programs and services. The visit also provides an opportunity to identify those children who will require referral to specialized services.¹¹ The requirements for this referral are: documentation of a discussion about the child's development using a tool completed by the parent or caregiver (e.g., the Nipissing District Developmental Screen) and by the physician (the Rourke Baby Record). If either instrument suggests that developmental milestones are not being met, referral to appropriate services or more specialized assessment should be undertaken by the primary care physician. The "enhanced" nature of the visit refers to the opportunity to elicit parental concerns in greater depth and to engage caregivers in a discussion regarding healthy child development.¹¹

A preliminary evaluation of the 18-month EWBV for the first year of the program suggested that uptake was approximately 40% but was increasing over time.¹ Differences by geographic region and socioeconomic status were noted. The report, however, was limited in several ways. First, the program was still early in its implementation at the time the report was published in 2010. The tracking of billing claims over a longer period will provide a more accurate picture of visit uptake. Second, at the time, only limited data were available on child and family characteristics and no information on medical risk was included in the analysis. Finally, beyond region of the province, there was no specific information on provider characteristics in the first evaluation. Because screening programs like the EWBV take place in the primary care system, we need to understand the barriers that may exist at a provider level.

In order to more thoroughly evaluate the EWBV, the objectives of this report were to:

1. Describe uptake of the enhanced visit by region and by primary care practice setting
2. Identify child, family and primary care provider characteristics associated with receipt of the visit

Methods

Databases

All data are housed at the Institute for Clinical Evaluative Sciences (ICES). At ICES, encrypted and anonymized identifiers are used to link individuals across a variety of different population-level administrative databases. For this report, we used: the Registered Person's Database (RPDB), which includes demographic information for all residents eligible for health care; the ICES Physician Database (IPDB), which contains information on physician demographic characteristics, specialty training and practice location; the physician fee-for-service claims file (Ontario Health Insurance Plan [OHIP]), the mechanism through which nurse practitioner activity is captured as well all fee-for-service physicians paid by the Ontario Ministry of Health and Long-Term Care; the Client Agency Program Enrolment (CAPE) tables, which identify patients enrolled in primary care models and to primary care physicians over time (a separate file provided by the Ministry of Health and Long-Term Care identified the physicians that were part of a Family Health Team [FHT]); MOMBABY, an ICES-derived database that links the inpatient hospital admission records of delivering mothers and their newborns; the Citizenship and Immigration Canada Permanent Resident Database (Ontario portion), which contains immigration application records for people who successfully applied to land in Ontario since 1985; and the 2006 Census.

Study Cohort

Ontario children eligible for the 18-month enhanced well-baby visit (EWBV) between December 1, 2009 and June 30, 2012 (i.e., born in an Ontario hospital between July 1, 2008 and June 30, 2010, rendering them eligible for the 18-month EWBV between 17 and 24 months of age) were included. We did not include children with a documented birth weight less than 400 grams or greater than 6,999 grams (n= 150), those who died (n= 1,035) or moved out of the province (n=11,442) before 24 months of life. Children seen at a community health centre (CHC) between August 2008 and September 2010 were also excluded because CHC physicians do not submit billing claims to OHIP rendering EWBV information incomplete for these children (n= 2,308).

A hierarchical process was used to assign a child to a usual provider of care (UPC) at 16 months of age. First, we used the CAPE database to ascertain whether a child was rostered to a physician in a primary care model, under which family physicians receive some capitated fees for rostered patients. For non-rostered children, we used primary care fee codes that are used for anticipatory care such as immunizations and well-baby visits* to assign the UPC as the physician who provided the majority of this care. In the event of more than one physician providing the same amount of anticipatory care, we used all core primary care visits and chose the physician who provided the majority of overall primary care. If this process still resulted in more than one physician being assigned, the most recent care provider was selected as the primary physician. Finally, children who were not rostered or who had no primary care billings were designated as having 'no-care' and were excluded from the cohort (n= 4,431). Many of these would be children seen by physicians who do not bill or whose care is predominantly delivered by nurse practitioners. Therefore, the total sample size consisted of 261,534 children, 55.2% of whom were rostered by CAPE.

**List available upon request*

Child Characteristics

Child postal code, sex and birth weight were obtained from the child birth record. To characterize children at greater risk for developmental disorders, we examined birth weight measured in grams and categorized children into clinically meaningful classes to facilitate comparisons: extremely low (400 to 999g), very low (1,000 to 1,499g), low (1,500 to 2,499g) and normal (> 2,500g) birth weight. We used OHIP billings to assess whether a child had already had a developmental assessment or a diagnosis consistent with a developmental disorder prior to age 16 months. We used the mean income quintile for a child's neighbourhood (dissemination area) adjusted for household size and community as a measure of socio-economic status using the Postal Code Conversion File Plus (PCCF+).¹²

Primary Care Physician Characteristics

Physician characteristics included: sex, number of years in practice and the identification of graduation from a foreign or domestic school. Number of years in practice was categorized into five-year bands: five years or less, six to 10 years, 11 to 15 years, 16 to 20 years and more than 20 years. Adjustment for medical training was taken into account when computing this variable (i.e. four years were added to a paediatrician's time in practice and two years were added to a family physician's time in practice). For family physicians' membership in a primary care enrolment model (PEM), the models were described: Family Health Networks and Family Health Organizations (FHNs/FHOs); Family Health Groups and Comprehensive Care Models (FHGs/CCMs); Family Health Teams (FHTs); physicians who do not work under a model; and 'Other' models, which include several smaller models that are not responsible for the majority of primary care to the child population (e.g., Rural-Northern Physician Group Agreement). Paediatricians were enumerated as a separate primary care category.

Outcome Measure

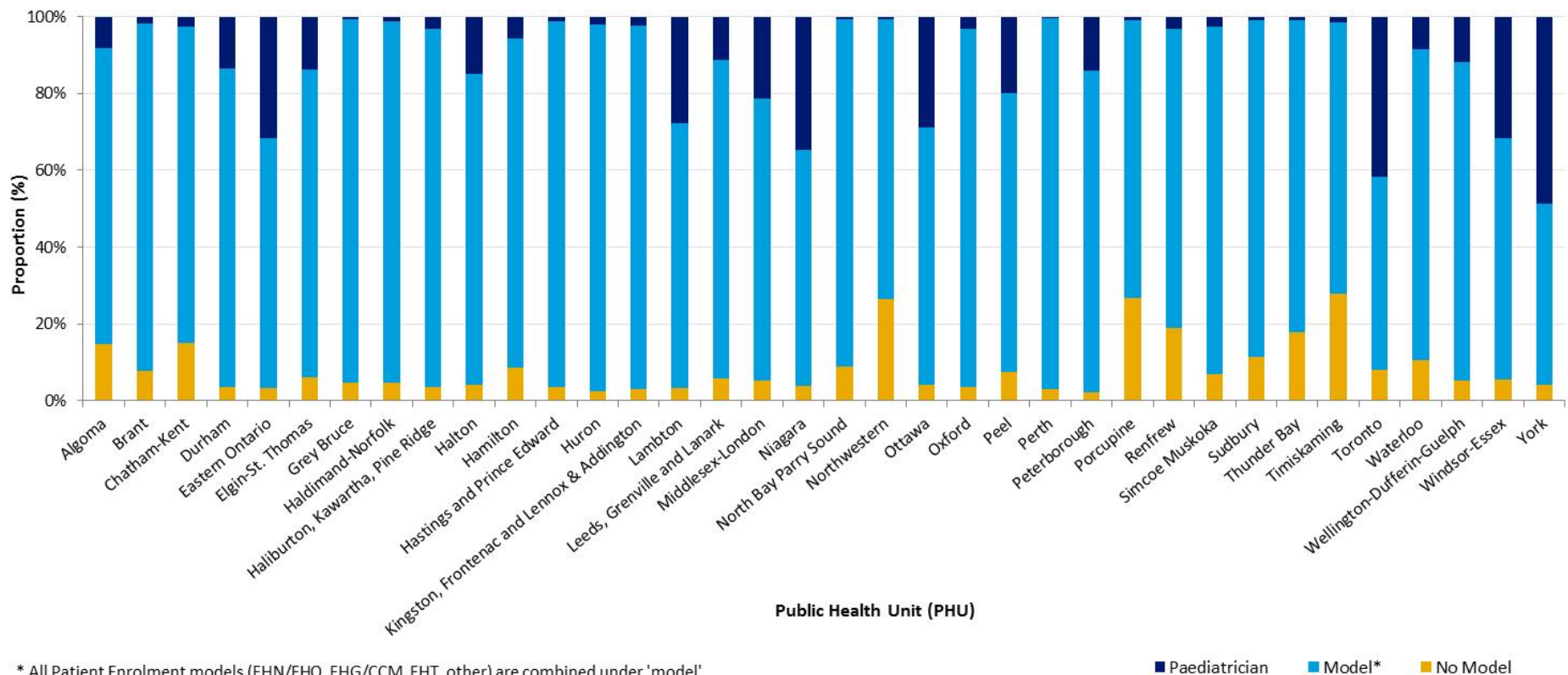
Using the OHIP database, we used the physician billing claims for the EWBV (A002 for family physicians and A268 for paediatricians) to measure if the visit occurred between 17 to 24 months of life.

Analyses

To understand the larger context of who delivers primary care to young children in Ontario, we used descriptive statistics to describe the proportion of children receiving primary care by physician practice type. Since some FHTs employ nurse practitioners who may perform the EWBV, but for whom we do not capture complete billings, we calculated the rate of EWBV for FHTs excluding those with nurse practitioners. We describe the proportion of children who received the EWBV by public health unit and by Local Health Integrated Network boundaries. We compared the proportion of those with and without an EWBV claim across child and physician characteristics using Chi-square analysis.

Exhibits and Findings

EXHIBIT 1 Proportion of children receiving primary care by practice type, by public health unit, birth years 2008 to 2010 (N=261,534)

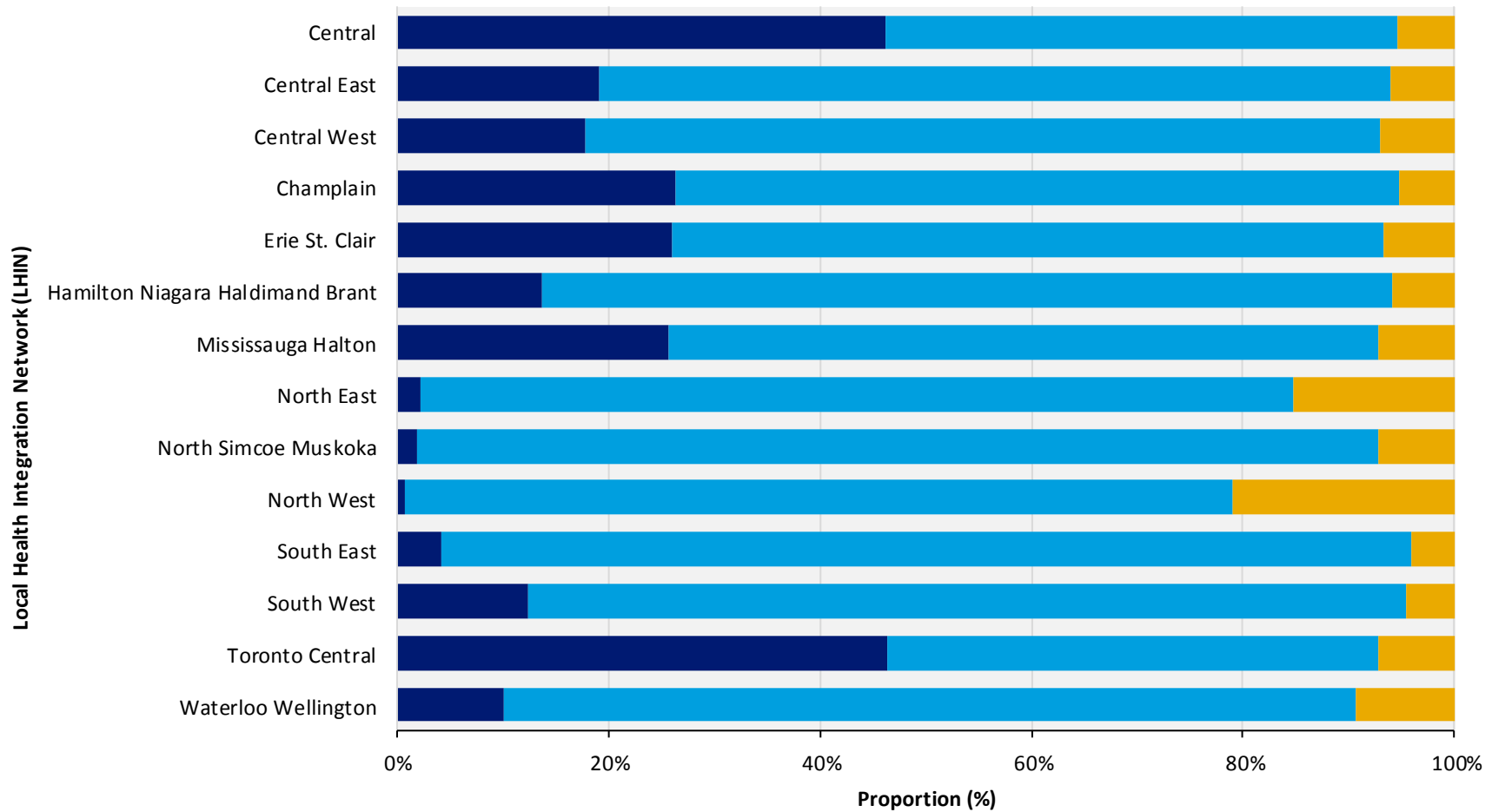


* All Patient Enrolment models (FHN/FHO, FHG/CCM, FHT, other) are combined under 'model'

■ Paediatrician ■ Model* ■ No Model

- The majority of children across Ontario PHUs are cared for by family physicians who work within a patient enrolment model (PEM).
- The largest proportion of children seen by primary care paediatricians live in York Region, Toronto, and Niagara PHUs (48.5%, 41.7%, and 34.6%, respectively).
- Children receiving care from family practitioners who are not affiliated with an enrolment model are more often located in Northern Ontario PHUs such as Timiskaming, Porcupine, and Northwestern.

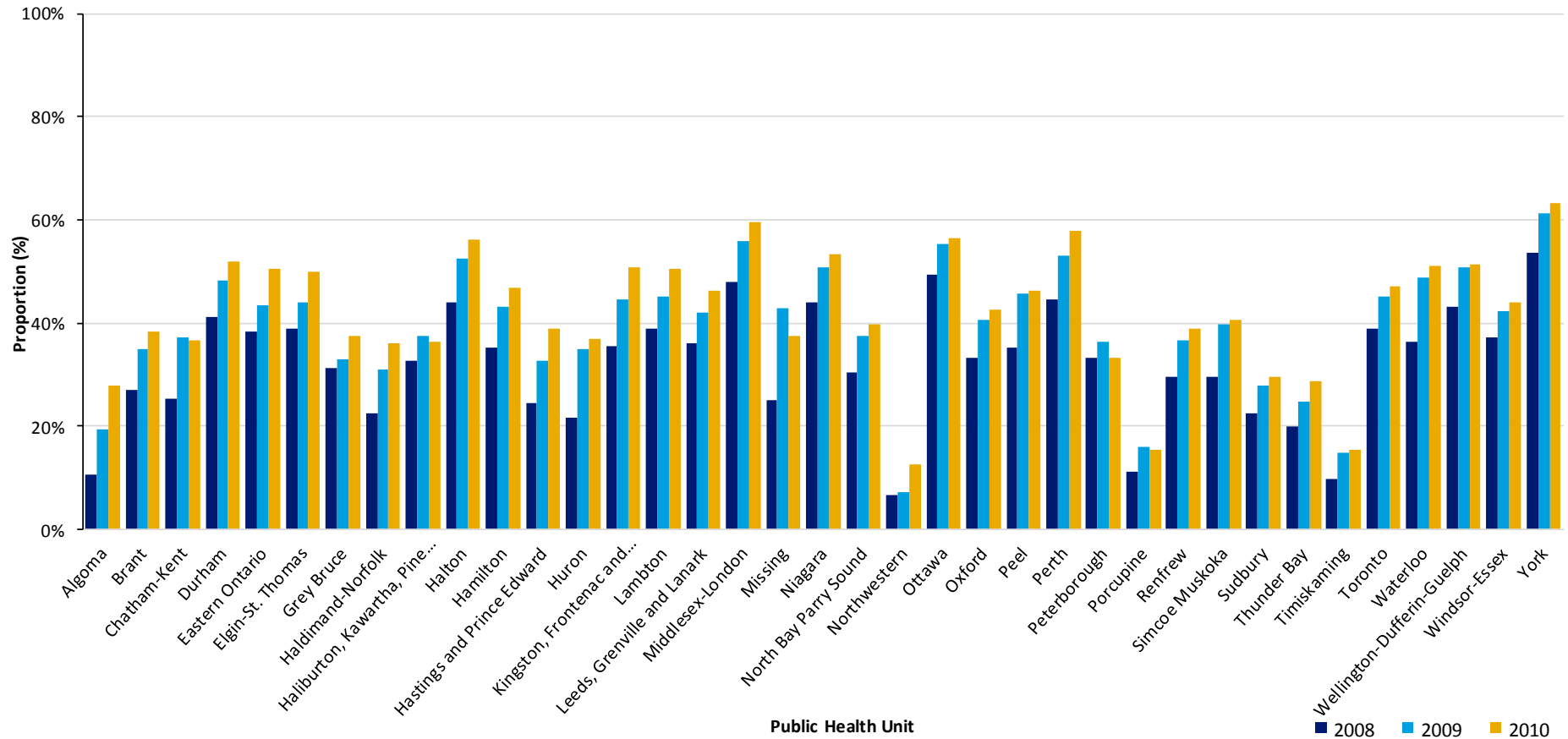
EXHIBIT 2 Proportion of children receiving primary care by practice type, by Local Health Integration Network, birth years 2008 to 2010 (N=261,534)



* All Patient Enrolment models (FHN/FHO, FHG/CCM, FHT, other) are combined under 'model' ■ Paediatrician ■ Model* ■ No Model

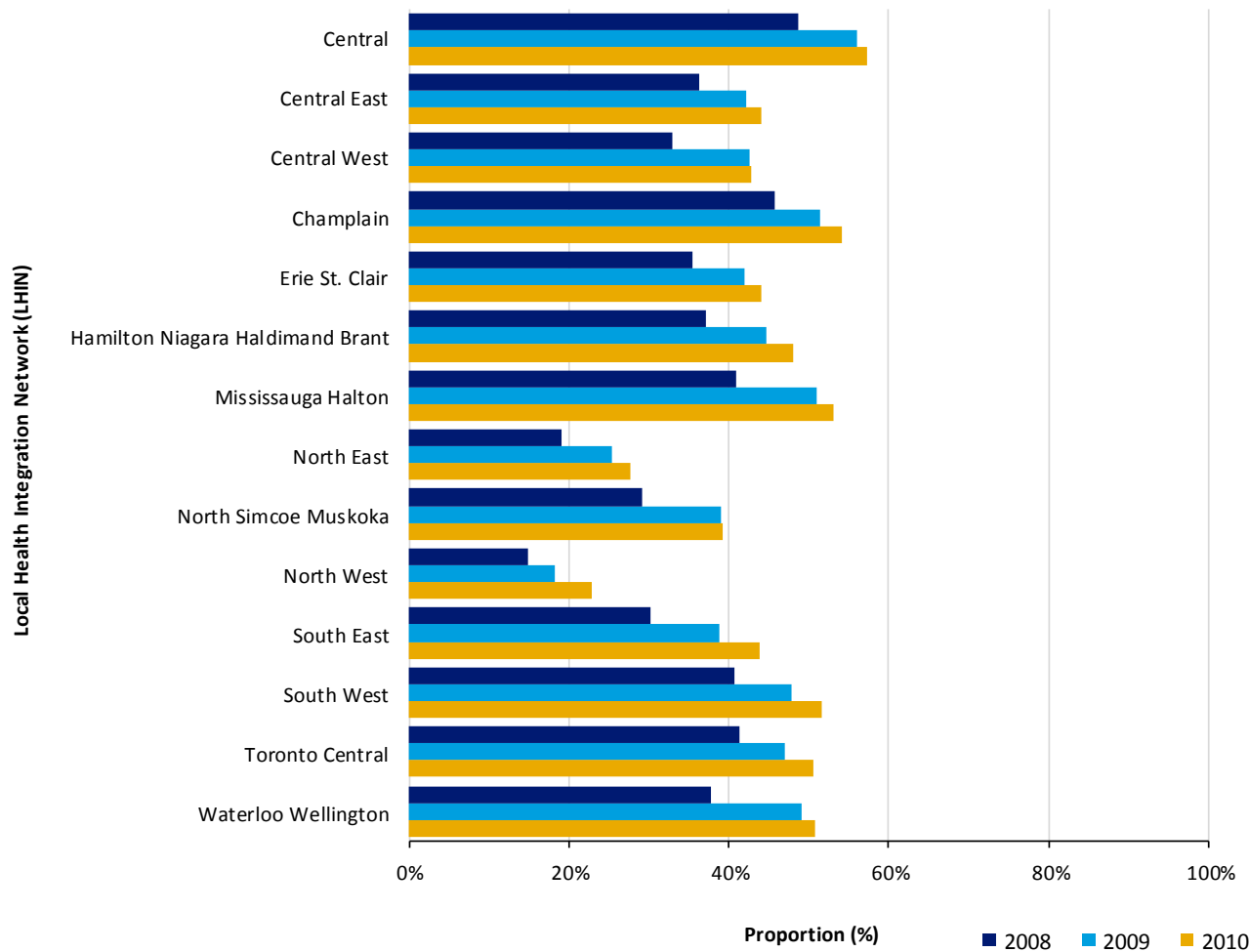
- The majority of children across Ontario LHINs receive primary care from family physicians affiliated with a PEM; the largest proportions are in the South East and North Simcoe Muskoka LHINs (91.8% and 91.0%, respectively).
- The largest proportion of children cared for by paediatricians live in the Toronto Central and Central LHINs (46.4% and 46.3%, respectively).

EXHIBIT 3 Proportion of children aged 17 to 24 months who received an 18-month enhanced well-baby visit, by public health unit, by birth year (2008 to 2010) (N=261,534)



- Overall, there has been a steady increase in the proportion of children receiving the visit among every Ontario PHU since the province implemented the program.
- Northern PHUs have the lowest proportions of children receiving the EWBV.

EXHIBIT 4 Proportion of children aged 17 to 24 months who received an 18-month enhanced well-baby visit, by Local Health Integration Network, by birth year (2008 to 2010) (N=261,534)



Compared to children born in 2008 (the earliest year that the EWBV visit was available), the proportion of children receiving the visit has increased over time across all LHINs. Uptake is lowest in the northern LHINs.

EXHIBIT 5 Proportion of children who received an 18-month enhanced well-baby visit, birth years 2008 to 2010 (N=261,534)

18-month EWBV (%)*	
Sex	
Male	43.2
Female	43.5
Birth Year	
2008	38.4
2009	46.0
2010	48.2
Location of Residence	
Urban	44.6
Rural	32.4
Neighbourhood Income	
Missing	22.5
Quintile 1 (lowest)	36.4
Quintile 2	40.7
Quintile 3	40.0
Quintile 4	48.2
Quintile 5 (highest)	48.8
Developmental Disorder or Developmental Assessment	
Yes	47.0
No	43.2

18-month EWBV (%)*	
Mother's Age at First Delivery	
Missing	29.9
≥ 19 years	44.6
< 19 years	29.2
Mother's Immigration Status	
Non-Immigrant	44.3
Immigrant	42.4
< 5 years	39.5
5 to 10 years	42.5
≥ 10 years	44.6
Refugee	38.2
Birth Weight	
Extremely low	39.2
Very low	44.4
Low	44.8
Normal	43.3

* With the exception of sex, differences in proportions within each category are statistically significant ($p < .001$), proportions reported are for each group designated in the row.

- Overall, 43.3% of the total sample of eligible children received the EWBV. The proportion increased from 38.4% among children born in 2008 to 48.2% among children born in 2010.
- As income quintile increased, so did the proportion of children who received the EWBV.
- Children of mothers with a first birth under the age of 19 were much less likely to have received the EWBV (29.2% vs. 44.6%).
- There was little difference in the proportion of children receiving the EWBV by maternal immigrant status. However, within the group of immigrant mothers, EWBV rates were lowest for children of recent immigrants (39.0%) and refugee mothers (38.0%).
- Birth weight is not related to receipt of an EWBV; with the exception of children born at extremely low birth weights, who had slightly lower visit rates compared to all other birth weight categories.

EXHIBIT 6 Proportion of children who received an 18-month enhanced well-baby visit, by primary care physician type (N=8,883 physicians)

	Paediatrician	FHN/FHO	FHG/CCM	FHT	Other Models	No Model
Total number of physicians	528	2,138	2,720	1,716	382	1,399
<i>Male</i>	294	1,253	1,589	948	187	895
<i>Female</i>	228	878	1,127	763	192	461
<i>Missing</i>	6	7	<6	<6	<6	43
Total number of study children, n (%)	60,524 (23.5)	57,609 (22.4)	73,919 (28.8)	46,673 (18.2)	4,805 (1.9)	13,573 (5.3)
Total number of children receiving EWBV, n (%)	36,059 (59.6)	26,170 (45.4)	27,752 (37.5)	20,117 (43.1)*	784 (16.3)	2,312 (17.0)
Median rate (IQR) EWBV	46.7% (0.0%, 72.8%)	47.1% (14.3%, 68.4%)	33.3% (8.0%, 60.0%)	41.3% (14.2%, 64.0%)	0.0% (0.0%, 14.3%)	0.0% (0.0%, 14.3%)
Volume of children (0 to 6 years) in practice, mean \pm SD	1,366.7 \pm 1,075.2	214.6 \pm 187.4	353.4 \pm 427.3	205.0 \pm 163.6	98.6 \pm 111.1	394.1 \pm 584.1

* FHTs with nurse practitioners EWBV rate= 40.4%; FHTs without nurse practitioners EWBV rate = 51.4%.

- The majority of children received care from family physicians; 28.8% have a family physician who belonged to a FHG/CCM PEM, 22.4% have a family physician who belonged to a FHN/FHO PEM, 18.2% have a family physician who belonged to a FHT PEM. The remaining 7.2% saw family physicians in other models or no model.
- 23.5% of children received primary care delivered by paediatricians.
- Proportions of children receiving the EWBV were highest in paediatrician practices (59.6%) and lowest in family physician practices that are not part of a primary care reform model (17.0%).
- The overall proportion of EWBV in children cared for by FHTs is 43.1%; however, this proportion was higher in FHTs without nurse practitioners (51.4% vs. 40.4%).

EXHIBIT 7 Proportion of children who received an 18-month enhanced well-baby visit, by physician characteristics (N=8,883 physicians)

Physician Characteristic	N (%)	18-month EWBV (%)*
Sex		
Male	5,166 (58.2)	39.7
Female	3,649 (41.1)	50.1
Missing	68 (0.8)	30.2
Time in Practice (years)		
<5	860 (9.7)	49.5
6-10	863 (9.7)	51.7
11-15	987 (11.1)	48.5
16-20	1,334 (15.0)	46.9
21+	4,750 (53.5)	40.3
Missing	89 (1.0)	26.6
Medical Training		
Domestic	6,426 (72.3)	45.0
Foreign	2,408 (27.1)	42.1
Missing	49 (0.5)	19.5

*Differences in proportions within each category are significant (<p.001).

Physician characteristics associated with higher uptake of the EWBV included female sex (50.1% vs. 39.7%), fewer years in practice (<10 years; higher rates than 11 and over) and domestic medical training (45.0% vs. 42.1%).

Limitations and Interpretive Cautions

For this report, children seen at community health centres (CHCs) were excluded. Although this is a small proportion of the overall population (<1.0%), CHCs serve populations that are more likely to be: from lower income neighbourhoods, newcomers, on social assistance and living with mental illness and/or chronic health conditions.¹³ Access to information on children who receive care from CHCs would further enhance our understanding of the 18-month EWBV uptake in a vulnerable subgroup of children.

Further, we were unable to ascertain EWBVs conducted by nurse practitioners. We described lower proportions of the visit taking place in practices that use nurse practitioners, which is most likely the result of incomplete billing data rather than lower proportions of children receiving the EWBV. This may also explain the low proportions of children receiving the visit in Northern Ontario, since nurse practitioners do much of the primary care for children in rural and remote areas. However, the relatively small proportion of children cared for by nurse practitioners implies that this undercounting would not substantially alter the overall proportion of children receiving the visit in Ontario.

Conclusions

- Uptake of the 18-month enhanced well-baby visit has increased since its introduction, but still fewer than half of eligible Ontario children are receiving the visit.
- Regional differences described in the earlier evaluation of this program persist.¹ A better understanding of the barriers to these visits, especially in Northern Ontario, will be important. However, reliance on nurse practitioners in the north (*see pg. 20*) may mean that we have underestimated the proportion of children in the north who have received the visit.
- Differences in uptake of the EWBV by physician characteristics are important for consideration. Physicians who are male and have been in practice longer may need to be the target of an EWBV education campaign. Similarly, children whose family physicians are not part of reform models had very low rates of EWBVs. This finding may also signal that other primary care needs are not being addressed.
- It is not surprising that children who are known to have developmental disorders or those who have previously had a developmental assessment were more likely to have received an EWBV. Although extremely low birth weight children are at higher risk for a number of developmental disorders,¹⁴⁻¹⁶ these children receive specialized developmental follow-up at 18 months in neonatal follow-up clinics associated with the level three neonatal intensive care units where they received their intensive care. Follow-up rates have been shown to be very high for these developmental assessments in Ontario,¹⁷ therefore the lower EWBV rates in this high-risk population are unlikely to indicate unmet need for developmental assessment.
- We found disparities in EWBV completion by social risk, with lower rates of visit completions among children living in the lowest income quintile neighbourhoods and among children whose mothers were refugees or were younger than 19 years at time of her first pregnancy. Further program development should ensure that the barriers for these high-risk families are addressed.
- Future steps in the evaluation of this program should include an assessment of EWBV impact on developmental service use and outcomes. Currently, there is no surveillance system in place to measure the results of the EWBV. Better Outcomes Registry & Network (BORN) Ontario is conducting pilot work with E-Health to assess the feasibility of a standard electronic Rourke and Nipissing record as part of the electronic medical record used by primary care providers. Future work will explore the possibility of record linkage to health and developmental service data to begin to explore the implications of this enhanced visit for both current developmental service delivery and childhood developmental outcomes. Primary data collection studies to examine the quality of EWBVs (i.e. time physician spends with family, completeness of evaluation, use of tools) and to estimate referrals to services (e.g., speech-language programs) not covered by OHIP are also required to evaluate the overall effectiveness of this program.

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