Enhanced 18-month Well Baby Visit Evaluation

Kingston Community Health Centres

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Executive Summary

Background

The 18-month well baby visit is an important primary care visit in early childhood. It has been identified as a key time where primary care providers can conduct an in depth assessment of child development and start a discussion with parents and caregivers to support healthy child development and parenting. Ongoing evaluations of the EWBV implementation can help ensure that it is an effective service for promoting the healthy development of all children. Since 2012 KFL&A Public Health has partnered with primary care practices annually to assess the implementation and quality of EWBVs provided in our region. This report describes the implementation of the 18-month EWBV at Kingston Community Health Centres (KCHC) for patients eligible for the visit between April 1, 2015 and March 31, 2016. The evaluation results documented in this report can help to inform improvements in EWBV service delivery and facilitate a longitudinal, supportive relationship between KFL&A Public Health and the KCHC.

Methods

An Electronic Medical Record query identified all patients eligible for the 18-month visit within a 1-year period from April 1, 2015 to March 31, 2016. Patient records were manually reviewed to report on the proportion of patients who received the 18-month EWBV and 18-month immunization. Details of the EWBVs were also reviewed including the use of tools like the Rourke Baby Record and NDDS, immunizations given, and referrals made. The collected data was analyzed to determine the implementation rates of the EWBV and 18-month immunization, to assess the quality of the EWBVs being provided, and to provide information on the developmental needs and priorities of the KCHC patient population. Along with audit results this report includes analysis of EWBV implementation with successive annual audits and across all levels of patient material and social deprivation.

Results

After exclusions, there were 49 infants eligible for inclusion in the audit. Of the eligible cohort, 93.9% of children received an EWBV and 91.5% received an 18-month immunization. The Rourke Baby Record (RBR) was filled out at 97.8% of visits and the NDDS was used at 82.2% of visits. The implementation rate of the EWBV, 18-month immunization, and RBR, all increased from previous audits. However, the use of the NDDS was decreased from previous audits. A total of 37% of children assessed at the visit were found to be at risk for overweight, overweight, or obese. Referrals or recommendations were made at 54.3% of visits, the most common reason for a recommendation or referral was speech and language.

Conclusion

This audit report indicates very positive trends in the quality of EWBVs being conducted at the Kingston Community Health Centres. KFL&A Public Health aims to help facilitate further improvements by continuing to develop a lasting partnership with KCHC. Specific recommendations to support EWBV implementation are to support the integration of tools and visit notes into the EMR to promote tracking and recording of the EWBV, and to use assessment tools such as the RBR and NDDS at every visit. Going forward, KFL&A Public Health will continue to support initiatives targeting the universal implementation of the EWBV, contribute to resource development, and share lessons learned.
Background

The 18-month well-baby check is a pivotal visit in the sequence of scheduled primary care provider contacts in early childhood. It presents an opportunity for primary care providers to assess child health, continue the publicly funded immunization schedule, and build relationships between primary care providers, parents, and community services. Furthermore, it is usually the last in a series of scheduled primary care visits prior to school entry, making it a critical developmental checkpoint. In Ontario, it is estimate that approximately 25% of children are entering school with preventable physical, emotional, cognitive, or speech and language delays. These vulnerabilities can negatively affect a child’s ability to succeed in the future, and support the need for early intervention to ensure these children get the support they need to promote healthy development.

Therefore, in 2005, the focus of the 18-month well-baby visit was shifted toward an enhanced assessment of developmental progress as recommend by an expert panel in the report Getting it right at 18-months... Making it right for a lifetime. Well-baby visits are regular check ups that include complete examination of the infant, physical growth measurements, and a discussion with parents or guardians regarding health care. The enhanced 18-month well baby visit (EWBV) was developed to be a more in depth assessment than the traditional well baby check. In addition to regular well-baby care, the EWBV should include:

- A developmental review and evaluation with parents or caregivers using standardized developmental tools and checklists
- Discussion with parents/caregivers on healthy child development and behaviour
- Provision of information on parenting, literacy, and community programs; such as library program and the Ontario Early Years Centres
- Timely facilitation of referrals for patients with potential developmental concerns to specialized community services, such as Healthy Babies Healthy Children

These enhanced criteria are meant to focus the EWBV on building effective partnerships and creating a culture that improves the developmental health and well-being of young children.

Fee Codes

In October 2009, new fee codes for the EWBV were introduced to the OHIP Schedule of Benefits by the Ontario Ministry of health and Long-term Care (MOHLTC) to reflect the additional time necessary for the enhanced visit, and to provide an added incentive for conducting the appointment. The relevant fee code for general practitioners and family physicians is A002, valued at $62.20. The A002 fee code is applicable when conducting well baby care with a patient between 17 and 24 months of age. In order to be eligible for the enhanced fee, the visit must include:

- Services of a standard well-baby care visit
- An 18-month age-appropriate developmental screen such as the Rourke Baby Record (RBR)
- Review with the caregiver of a standardized tool, completed by the caregiver, that assesses risk of developmental delay such as the NDDS.

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1 While the language of the OHIP Schedule of Benefits refers to the Rourke Baby Record as a developmental screen, the RBR should not be considered a screening tool. The RBR is an evidence-based health supervision guide.
In addition to the completion of the above requirements, the enhanced fee code is applicable only if the developmental screen and any concerns identified are recorded in the patient’s permanent medical record, along with the required documentation for well-baby care services.4

**Project Description**

Ongoing evaluations of the EWBV are necessary to ensure that it is an effective strategy for promoting and enhancing the healthy development of all children in Ontario. Consequently, KFL&A Public Health is interested in assessing the implementation and quality of EWBVs by partnering with primary care practices in our region. This report describes the implementation of the 18-month EWBV at Kingston Community Health Centres for patients eligible for the visit between April 1, 2015 and March 31, 2016. The evaluation results documented in this report should help to inform evidence-based improvements with respect to the EWBV at KCHC moving forward.

The project is also a means to facilitate a longitudinal, supportive relationship between KFL&A Public Health and the KCHC. As a fundamental component of this relationship, KFL&A has a designated Public Health Nurse (PHN) to provide educational and supportive resources, and empower staff at KCHC with best practice knowledge and materials. KFL&A led initiatives have included in-services for primary care practitioners on conducting comprehensive 18-month visits, designing customized resource packages for practices to provide at 18-month visits, and knowledge exchange workshops on early child development. Additionally, a Quality Improvement Plan (QIP) toolkit was developed to facilitate inclusion of the EWBV in the annual QIP submitted to the MOHLTC, encouraging practices to formalize their commitment to improving delivery of the EWBV. The QIP toolkit has been endorsed by the Ontario College of Family Physicians.

**Project History**

The 2010 Ontario Medical Review featured article regarding the province-wide implementation of the EWBV, and the 2011 Institute for Clinical Evaluative Sciences (ICES) preliminary evaluation report on the uptake of the new fee code for the EWBV across Ontario both raised concern regarding low implementation rates of this fundamental visit in the South East Local Health Integration Network region.4,6 Prompted by these findings, Kingston, Frontenac, and Lennox and Addington Public Health (KFL&A) collaborated with the Queen’s Family Health Team (QFHT) to evaluate the implementation of the EWBV in the QFHT practice. In this pilot project, QFHT implemented a continuous quality improvement initiative, which led to a practice-wide intervention to improve the implementation rates of the EWBV.7 The components of this intervention included resident and staff education, clinical booking and identification processes, specialized clinical practices, and implementation of standardized tools. The results of the post-implementation audit indicated that QFHT had achieved a 96% implementation rate for the EWBV, and a 93% implementation rate for scheduled 18-month immunizations.7 In terms of planning and implementing an EWBV intervention program, analyzing the results and acting upon the outcomes, QFHT has become a standard for quality improvement practices, and the benchmark practice for the EWBV auditing project among other KFL&A primary care practices.

Since the initial pilot, the EWBV evaluation has expanded to include a number of primary care practices in the KFL&A region. In 2012, three practices were audited to describe the pattern of use of billing codes or billing code equivalencies for eligible EWBV patients between the period of January 1, 2010 to December 31, 2011. In 2013, these three practices were involved in 6-month follow up audits using their electronic medical records (EMRs) to assess the implementation of the EWBV for eligible patients during the audit date range of October 1, 2012 to March 31, 2013. Two additional family health teams also joined the project in 2013 and participated in their first audit for the time period from January 1, 2010 to December 31, 2011. In 2014, five audits were conducted for the time period between April 1, 2013 and March 31, 2014 and one new practice joined for its initial audit for
the time period from April 1, 2012 to March 31, 2014. In 2015, five primary care practices were audited for either their second, third, or fourth evaluation for the time period between April 1, 2014 to March 31, 2015.

Along with the annual audit report the project has included a number of knowledge exchange activities. In 2012, KFL&A hosted a local conference with Best Start called On Track - Supporting Healthy Child Development and Early Identification in the Early Years. In 2014, KFL&A hosted a workshop for local primary care providers, public health professionals, and early child development agencies to share best practices for the 18-month well baby visit. Furthermore, the EWBV evaluation was shared at the annual South East LHIN Primary Health Care Forum; as a workshop in 2013 and an exhibit in 2015.

Table 1: KFL&A Public Health’s EWBV Evaluation Project History

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Practices</th>
<th>Audit Date Range</th>
<th>Audit Time Period</th>
<th>Birth Cohort Date Range</th>
</tr>
</thead>
</table>

Kingston Community Health Centres (KCHC) joined the EWBV evaluation project in 2012, and participated in a follow-up audits in 2013, 2014, and 2015. These audit reports assessed the implementation of the EWBV and 18-month immunizations within the practice as well as data relating to assessment tools used, referrals given, and patient socioeconomic status to describe the service delivery patterns of the EWBV within the KCHC.

Methods

Data Collection

Before commencing data collection, ethics approval for this project was renewed with the Queen’s University Health Sciences Research Ethics Board and an new data share agreement between KFL&A Public Health and Kingston Community Health Centres was signed for the audit period from April 1, 2015 to March 31, 2016.

The full cohort of patients eligible for an EWBV during the one-year audit period from April 1, 2015 to March 31, 2016 was assembled through birth date queries to the EMR for patients born between April 1, 2013 and October 31, 2014 who receive primary care at KCHC. Patients who received the visit outside of the eligible date range, joined or left the practice during the eligibility time period without documentation of a visit, joined the practice after 24 months of age, were not active patients (indicated by having no visit recorded during the audit data range) or those who had not yet received an EWBV as of the audit end date but who were still eligible for the visit at the audit end date (less than 24 months old) were excluded from the data set. Relevant data for the remaining patients was retrieved using manual chart audits of the EMR. Paper charts were also consulted to supplement EMR data for each patient.
The following data was collected for each eligible patient:

- OHIP number
- Date of birth
- Postal code
- Date of EWBV (if applicable)
- Length and weight at visit
- Use of RBR
- Completed sections of the RBR
- Breastfeeding Status
- Use of NDDS
- Use of the A002 billing code
- Immunization details
- Referral and recommendation details
- Provider classifications
- Relevant supplementary details

Data was recorded in a Microsoft Excel spreadsheet and saved on an encrypted USB for transfer to KFL&A Public Health. No identifying information was included in the subsequent analysis.

**Data Analysis**

Microsoft Excel software was used to summarize quantitative data. EWBV implementation rates and 18-month immunization rates were calculated for the entire cohort of eligible children. For the patients that received the EWBV further analysis was undertaken to produce charts and frequency graphs to summarize data pertaining to primary care provider type, use of billing codes, use of the RBR and NDD, details of the RBR, number and nature of referrals and recommendations, and number and nature of immunizations administered at the EWBV. Implementation rates were calculated for the KCHC practice as a whole and were stratified by location for the Kingston and Napanee sites. Patient length and weight data at the 18-month visit were compared to the World Health Organization (WHO) Growth Charts for Canada to assess child growth, as per the most recent growth monitoring recommendations in Canada. This weight-for-length measure was then used to categorize children as wasted (< 3rd percentile), normal (3rd-85th percentile), at risk of being overweight (>85th percentile), overweight (>97th percentile), or obese (99.9th percentile).

In order to analyze the equitability of EWBV service delivery, postal code data was used to link each eligible patient to their corresponding deprivation rank according to the Institut national de santé publique du Québec (INSPQ) Deprivation Index via Dissemination Area Unique Identifiers (DAuid). The INSPQ Index, developed by the Canadian Institute for Health Information, combines material and/or social deprivation components to assign a deprivation rank of one (I – least deprived) through five (V – most deprived) to a physical geographic area. For the purpose of this analysis, deprivation rank was assigned using the combined (social and material) deprivation indexes. The following indicators are included in the Combined Deprivation Index, where items one to three correspond to material components and items four to six correspond to social components:

1. Education (proportion of the population aged 15 years and older without a high school diploma or equivalent)
2. Employment Ratios (ratio of employment to population for the population aged 15 years and older)
3. Income (mean income for the population aged 15 years and older)
4. Marital Status (proportion of the population aged 15 years and older who are separated, divorced or widowed)
5. Family Structure (proportion of single-parent families)
6. Persons Living Alone (proportion of the population aged 15 years and older living alone)

The index utilizes 2006 Census Dissemination Areas from Statistics Canada as the geographic boundary source. A null ranking is assigned when a patient DAuid represents a geographic area with a population that is too low to determine a rank in the deprivation index. Any postal code recorded that did not correspond to a Canada Post postal address was excluded from the analysis.

Results

Eligibility Criteria

An initial query to the EMR software to determine the total number of patients born between the period of April 1, 2013 and October 31, 2014 returned 74 patients. Of the eligible patients, a total of 25 were excluded from analysis. Children who received their EWBV prior to April 1, 2015 or after March 31, 2016 (n=18) were removed from the dataset. Children who enrolled in the practice during the eligibility date range, without full documentation of an EWBV (n=5) and children who left the practice during the eligibility period without documentation of an EWBV (n=1) were excluded from analysis. Finally, patients who received the visit from another source, such as a pediatrician (n=1) were excluded. After these exclusions, 49 infants remained eligible for inclusion in this audit.

Enhanced 18-Month Well-Baby Visits

The 18-month EWBV service delivery rate at KCHC between April 1, 2015 and March 31, 2016 was 93.9% (n=46). The average client age at the time of the EWBV was 18.8 months. Table 1 shows the breakdown of EWBVs by visit provider classification and by KCHC site. The visit provider was defined as the provider(s) who signed off on the visit in the EMR or on paper documents (e.g. the RBR) and does not include the provider who signed off on administering vaccinations, which in most cases was an RN.

Table 2: Number of EWBVs conducted by provider classification at KCHC.

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>Combined</th>
<th>Napanee site</th>
<th>Kingston site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse Practitioner (NP)</td>
<td>32</td>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>Physician (MD)</td>
<td>12</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>MD + Resident</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>NP + NP Student</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>12</strong></td>
<td><strong>34</strong></td>
</tr>
</tbody>
</table>
Infant Growth

Weight and length data collected at the time of each EWBV was used to find the length-for-weight measurement for each patient who received the visit. This was used to categorise each infant as wasted, normal, at risk of being overweight, overweight, or obese. Figure 1 displays the number of infants who fell into each category. Notably, only 13% of 18-month old children at KCHC can be classified as being overweight, or obese from the weight-for-length measurements at the 18-month EWBV.

![Weight for Length Classifications](chart.png)

Figure 1: Weight-for-length classification of KCHC patients as determined by weight-for-length percentiles calculated from weight and length measurements at the 18-month visit. The growth categories by weight-for-length percentiles are defined as follows: wasted (< 3rd percentile), normal (3rd-85th percentile), at risk of being overweight (>85th percentile), overweight (>97th percentile), or obese (99.9th percentile).

Developmental Review

Primary care providers at KCHC mostly used paper versions of the Rourke Baby Record and NDDS, not all records were uploaded to the EMR and physical paper files were reviewed for completed RBRs and NDDS checklists. One EWBV was excluded from analysis of RBR and NDDS implementation because the patient file was unavailable for review and therefore the use of these tools is unknown. An 18-month RBR was filled out at 44 of the 45 EWBVs included in analysis (97.8%). Most of these RBRs were comprehensive with written comments or check-marks in all four of the nutrition, education and advice, development, and physical examination sections (93.3%, n=42). An 18-month NDDS was filled out for 35 of the 45 EWBVs included in the analysis (77.8%), 2 EWBVs included the use of the Communication and Symbolic Behaviour Scales Development Profile as opposed to the NDDS, so in total 37 EWBVs included the use of a standardized developmental assessment tool (82.2%).
A referral or recommendation to a specialist or community resource program was made at 25 of the 46 EWBVs conducted (54.3%). Many visits included multiple referrals or recommendations, making the total number 50. Table 3 shows a breakdown of referrals/recommendations types made for the entire KCHC and the specific sites. Follow up visits to reassess speech or growth, Early Expressions referrals, and recommendations for Ontario Early Years Centre or Better Beginnings Kingston were the most commonly made referrals.

Table 3: Nature and number of referrals and recommendations made at the EWBVs at KCHC.

<table>
<thead>
<tr>
<th>Type of Referral/Recommendation</th>
<th>Total Referrals for KCHC</th>
<th>Napanee Site</th>
<th>Kingston Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-up at Clinic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Reassess Speech and Language</td>
<td>11</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>- Reassess Physical Development/ Growth</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>- Reassess both Speech and Growth</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>- Not specified</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Dental/Healthy Smiles</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Early Expressions Preschool Speech and Language</td>
<td>10</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Ontario Early Years Centre or Better Beginnings Kingston</td>
<td>7</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Dietitian</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Audiology</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ENT</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Day Care</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Daily Outdoor Playtime</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>18-month Resources</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>8</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

**Immunizations**

According to the publicly funded immunization schedule for Ontario, the designated immunization to receive at 18-months is the Diphtheria, Tetanus, Pertussis, Poliomyelitis and Haemophilus influenza type B vaccine (DTaP-IPV-Hib). Of the 49 eligible infants included in the audit cohort, 2 received their 18-month DTaP-IPV-Hib before the audit date range and before 17 months of age, and therefore were excluded from the immunization analysis. Therefore, of the eligible 47 infants, 43 received their 18-month DTaP-IPV-Hib (91.5%). Thirty-five of the immunizations were received at the EWBV, 5 patients were required to return to care to receive their 18-month immunization. These patients received the immunization during the audit date range and between 17 and 24 months of age, and therefore were included in the 18-month immunization total.

Patients may also receive other vaccines at the 18-month visit if they are behind on the publicly funded immunization schedule or if they receive the yearly influenza vaccine. Illness, behaviour, allergies, practitioner discretion and patient caregiver decisions account for the various immunizations administered during the EWBV. Table 4 provides a summary of all immunizations administered at the EWBV.
Table 4: Nature and number of immunizations administered during the EWBVs at KCHC

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Total Number Administered</th>
<th>Number at Napanee Site</th>
<th>Number at Kingston Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTap-IPV-Hib</td>
<td>43</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>Measles Mumps Rubella (MMR)</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Pneumococcal Conjugate</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Meningococcal-C Conjugate</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Varicella</td>
<td>10</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Influenza</td>
<td>6</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>22</td>
<td>43</td>
</tr>
</tbody>
</table>

**Napanee Site Summary Results**

A total of 14 patients were found to be eligible for the EWBV at the Napanee site between April 1, 2015 and March 31, 2016. Among these eligible patients, 12 received the EWBV (85.7%) and 11 received their scheduled 18-month immunizations within the audit date range (78.6%). Among the patients who received the EWBV, a RBR was filled out at all 12 visits (100%) and a NDDS was completed for 10 of the visits (83.3%). Referrals and recommendations were made at 5 of the 11 EWBVs (45.5%), as detailed in Table 2.

**Kingston Site Summary Results**

A total of 35 patients were found to be eligible for the EWBV at the Kingston site between April 1, 2015 and March 31, 2016. Among these eligible patients, 34 received an EWBV (97.1%) and 32 of the 33 eligible children received their scheduled 18-month immunizations within the audit date range (97.0%). Among the patients who received the EWBV, a RBR was filled out at 32 visits (97.0%) and a NDDS was completed for 27 (79.4%) of the 34 visits eligible for evaluation. Referrals or recommendations were made at 20 of the 34 visits (58.8%), as detailed in Table 2.
Figure 2: The implementation rates of the EWBV and 18-month immunization for eligible patients (age 17 to 24 months) from April 1, 2015 to March 31, 2016 at the Napanee site and the North Kingston site of the Kingston Community Health Centres and the proportion of visits where a RBR was used, an NDDS (or other developmental assessment tool) was used, or a referral/recommendation was made for all EWBVs conducted at the Napanee site and North Kingston site of the KCHC.

**Benchmark Analysis**

KCHC has now participated in five audits of the EWBV. Figure 3 shows the implementation rate of the EWBV and 18-month immunizations from the 2014, 2015, and 2016 audits. Only the last three years of the audit are included in the benchmark analysis because there were differences in data collection, measurement, and exclusion criteria in the 2012 and 2013 audits that make the results less comparable to the later audits. The consistent methodology used between the 2014, 2015, and 2016 audits allow for direct comparison of the results to measure progress over time.

It can be seen from Figure 3 that there have been many improvements across measures of implementation from the 2014 to 2016 audit. Both EWBV and 18-month immunization rates have increased since the 2015 audit and are now above 90% implementation for eligible children in the practice. It can be seen that use of the Rourke Baby Record has remained consistently high for the last three years of evaluation and that the proportion of visits resulting in a referral or recommendation has also increased. The use of the NDDS has remained high but has not shown the consistent increase between evaluations seen with other indicators. Going forward, the consistent use and recording of the NDDS or other developmental assessment tool should be a focus for conducting the EWBV at Kingston Community Health Centres.
Figure 3: The percentage of eligible patients at KCHC that received the EWBV and 18-month DTaP-IPV-Hib immunization in the 2014, 2015, and 2016 audits. The percentage of EWBVs at KCHC that included the use of an 18-month Rourke Baby Record (RBR), the percentage of EWBVs that included the use of an 18-month NDDS, and the percentage of EWBVs that resulted in a referral or recommendation in the 2014, 2015, and 2016 audits.

Deprivation Analysis

Deprivation index investigation is meant to determine if the EWBV and 18-month immunization implementation for KCHC patients are equitable across different socio-economic statuses. Implementation rates are stratified by level of deprivation, according to the INSPQ Deprivation Indices for material, social, and combined deprivation. This analysis offers contextual information showing stratification of implementation rates by deprivation rank; however, the small sample sizes within each group means there is a limited ability to detect trends and limited generalizability of results. Geographic coding indicated that 4 patient postal codes were either missing or incorrect, and 1 patients postal code was categorized as a null ranking. Figure 4 shows the cohort of eligible patients by deprivation rank as determined by the combined deprivation index score of each patient’s dissemination area. The figure also shows the number of EWBVs conducted and 18-month immunizations given to the population of infants within each deprivation rank.
Figure 4: The number of eligible patients, patients who received the EWBV, and patients who received their 18-month immunizations between the evaluation period of April 1, 2015 and March 31, 2016, stratified by the Combined (social and material) INSPQ Deprivation Index. For the 18-month immunization 2 patients were excluded from the analysis as they received the immunization outside of the audit date, therefore the number of eligible patients in the Most Deprived rank for the 18-month analysis is 22.

It can be seen from Figure 4 that all children who did not receive the EWBV are from dissemination areas with the highest levels of deprivation, and all children who did not receive 18-month immunizations are from dissemination areas with the two highest levels of deprivation. However, given the very high implementation rate of both the EWBV and 18-month immunizations, the small sample size of the audit cohort, and the fact that half of the cohort are within the most deprived group, there is no clear trend in the data to show that the delivery of this service is inequitable to populations of different deprivation levels.

Conclusion

Summary of Findings

The 2016 audit of the EWBV at Kingston Community Health Centres indicated high levels of implementation and quality of this service for KCHC patients. The EWBV implementation rate at KCHC was found to be 93.9%, a 10 percent increase from the implementation rate in the 2015 audit (82.6%). The proportion of eligible children who received the 18-month immunization experienced a similar increase from 80.43% in the 2015 audit to 91.5% in the 2016 audit. At the EWBVs, a RBR was filled out at 97.8% of visits included in the audit and an NDDS or other developmental assessment checklist was used at 82.2% of visits. While RBR use has increased to being
included as a part of almost every visit, the NDDS was used at less visits when compared to the 2015 audit results (94.7%). More than half of the EWBVs analysed in this audit included a referral or recommendation, and many of these visits included more than one recommendation or referral. Overall, KCHC appears to be making a strong effort to ensure that every child receives the EWBV and gets their 18-month immunizations. Visit quality also appears to be high and referrals or recommendations are being provided to a broader scope of patients.

This audit report indicates very positive trends in the quality of EWBVs being conducted at KCHC, however some EWBV-specific quality indicators still have room for improvement. KFL&A Public Health hopes to help facilitate these improvements by continuing to develop a lasting partnership with KCHC. In the past, primary care providers have expressed concern over barriers that limit their ability to conduct comprehensive 18 month appointments. To help overcome these barriers, KFL&A Public Health is available to provide educational and supportive materials to staff, as well as a basic data analysis of the current implementation rates through this evaluation. Recommendations made in this report should help to guide continuous quality improvements and provided insights into ways that KCHC staff can ensure the developmental health and well-being of each child.

**Project Limitations**

Existing studies of EWBV implementation, such as the provincial ICES evaluation, have the limitation of only assessing visit implementation by billing code rates; which does not capture all visits being conducted. The manual chart audit method used in this evaluation overcomes this limitation by capturing all EWBVs being conducted; including those that are not eligible for a billing code or that are not properly billed using the A002 code. However, there were still limitations present during the data collection and analysis components of this evaluation that may have affected the results. Potential limitations include:

1. The eligible cohort of patients was small. This makes it difficult to compare results and draw meaningful conclusions about EWBV implementation rates. Generalizability of the findings is also limited by the small sample size.

2. The manual chart audits are only as accurate as what is recorded in the EMR. In some cases, the data may under-represent the true service delivery rates if all information is not recorded. For example, referrals and recommendations that do not require an official MD or NP referral may only have been given orally and not recorded in the EMR.

3. Benchmarking analysis relies on data from different data collectors for each audit, who may have interpreted certain inclusion criteria and cut points differently. Every effort to ensure comparability was made, however some discrepancies are possible.

4. Due to the small sample sizes of the five Deprivation Index rankings after geographic coding, unstable rates are probable. This means that rates may fluctuate due to chance alone.

**Recommendations**

In order to continue offering enhanced early childhood services to KCHC patients, as well as to further the knowledge translation process between public health and primary health care practices, KFL&A Public Health has created several recommendations for the KCHC practice. Recommendations are based upon a benchmarking analysis of other primary care practices within the KFL&A jurisdiction.

- Implement a re-call process for missed EWBVs and/or 18-month immunizations: have clerical teams conduct simple EMR queries at the beginning of every month to identify eligible children, contact
relevant caregivers to re-schedule any missed EWBVs or 18-month immunizations, and ensure these appointments are conducted

- Support integration of up-to-date versions of the RBR and NDDS tools (2014 and 2011 respectively) into the EMR software, as well as integration of an EWBV-specific electronic form to support the inclusion of all visit details in the EMR
- Ensure that up-to-date versions of the RBR and NDDS (2014 and 2011 respectively) are used in both electronic and paper formats. It is important to use the most recent version of these tools as past versions may not be consistent with the most recent evidence-informed recommendations for healthy child development.
- Use the RBR (electronic or paper copy) and the NDDS at every EWBV appointment for quality assurance and comprehensive assessments
- Book the 18-month EWBV at the end of each 15-month appointment and provide caregivers with the 18-month NDDS at the 15-month appointment as well to better prepare them for the comprehensive discussion of child development at the EWBV
- Access ongoing PHN support in regards to enhancing knowledge on topic areas within the RBR that could benefit from improvement, such as education and advice
- Utilise Supportive materials, such as the 18-Month Enhanced Well-Baby Visit Referral Pathway, and the Best Start Learning to Play and Playing to Learn booklet. Provide suitable 18-month resources to each family at their EWBV. 18-month visit resources can be ordered from the KFL&A Public Health website
- Encourage recommendations for all children, not just those that require specific referrals for developmental concerns. All families can benefit from information on community programs for all children.
- Continue ongoing longitudinal audits of EWBV implementation with support from KFL&A Public Health

The above recommendations are meant to be included within the improved quality assurance process. Applying some of the above recommendations could help sustain the excellent rates of visit completion attained by KCHC and support continuous improvements in visit quality.

**Next Steps**

KFL&A Public Health continues to support provincial initiatives targeting the universal implementation of the EWBV, contributes to resource development, and share lessons learned. Based on the results of this project and annual feedback, KFL&A Public Health intends to:

- Continue resource partnering with the community and primary care practices
- Provide ongoing EWBV resources for participating primary care practices
- Maintain PHN link with primary care providers in support of EWBV implementation
- Maintain the Quality Improvement Plan (QIP) guiding framework to help primary care practices include the 18-month EWBV in their practice’s QIP
• Reinforce the use of the Healthy Babies Healthy Children program, Child and Baby Talk Phone Line, Early Expressions Preschool Speech and Language Services, Ontario Early Years Centre for Kingston and the Islands, Better Beginnings for Kingston Children, and Pathways for Children and Youth

• Eventually link audit results to Early Development Instrument (EDI) scores to assess any impact that the EWBV has on school-readiness and early childhood development in KFL&A

This project will continue to collect data from primary health care practices in the KFL&A region. Moving forwards, KFL&A Public Health hopes to expand the project to include additional practices so that we can capture greater than 80% of the primary care population. This report provides valuable insight into the landscape of EWBV service delivery at KCHC, and should be used to help guide quality improvement initiatives. Through ongoing collaboration, the project should also help to facilitate KCHC in conducting their own longitudinal audits, continuing data collection, and monitoring the sustainability of the changes in primary care.
References


