Vaccine Preventable Disease
Program Report 2011-2014

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## Abbreviations

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEFI</td>
<td>Adverse Events Following Immunization</td>
</tr>
<tr>
<td>BOHO</td>
<td>Board of Health Outcomes</td>
</tr>
<tr>
<td>Hep B</td>
<td>Hepatitis B</td>
</tr>
<tr>
<td>Hib</td>
<td>Haemophilus influenza type b</td>
</tr>
<tr>
<td>HPPA</td>
<td>Health Protection and Promotion Act</td>
</tr>
<tr>
<td>HPV</td>
<td>Human Papilloma Virus</td>
</tr>
<tr>
<td>IDS</td>
<td>Infectious Diseases, Dental and Sexual health</td>
</tr>
<tr>
<td>IMD</td>
<td>Invasive meningococcal disease</td>
</tr>
<tr>
<td>IPD</td>
<td>Invasive pneumococcal disease</td>
</tr>
<tr>
<td>ISPA</td>
<td>Immunization of School Pupils Act</td>
</tr>
<tr>
<td>Men-C</td>
<td>Meningococcal C-ACYW-135</td>
</tr>
<tr>
<td>MOHLTC</td>
<td>Ministry of Health and Long-Term Care</td>
</tr>
<tr>
<td>OPHS</td>
<td>Ontario Public Health Standards</td>
</tr>
<tr>
<td>ROWPHE</td>
<td>Region of Waterloo Public Health and Emergency Services</td>
</tr>
<tr>
<td>UIIP</td>
<td>Universal Influenza Immunization Program</td>
</tr>
<tr>
<td>VPD</td>
<td>Vaccine Preventable Diseases</td>
</tr>
</tbody>
</table>
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1.0 Introduction

The Vaccine Preventable Disease (VPD) Program is one of five programs in the Infectious Diseases, Dental, and Sexual Health (IDS) division of Waterloo Public Health and Emergency Services (ROWPHE). Comprised of multi-disciplinary staff, the program provides clinical and non-clinical programs and services to promote immunizations and prevent the acquisition and transmission of vaccine preventable diseases in Waterloo Region.

The Vaccine Preventable Disease Program is responsible to the Board of Health for implementing 13 requirements in the Vaccine Preventable Disease Standards of the Ontario Public Health Standards. 1 In addition, the VPD Program complies with two protocols — the Immunization Management Protocol (2013) and the Vaccine Storage and Handling Protocol (2014) — which outline how the Program should conduct its work. The goal of the standard is to “to reduce or eliminate the burden of vaccine preventable diseases.” The Board of Health expected outcomes, as outlined in the Standard, are listed in Appendix A. The Program is also required to comply with Ontario’s Immunization of School Pupils Act and the Child Care and Early Years Act (formerly the Day Nurseries Act), which are also incorporated into in the Standard.

The Program’s work is also guided by Ontario’s publicly funded immunization schedule. 2 The schedule provides a list of routine immunizations for children and adults that are offered free of charge to eligible residents.

In order to meet the requirements outlined in the Standard and related provincial legislation, Region of Waterloo Public Health’s (herein referred to as Public Health) VPD Program provides a variety of services to the residents of Waterloo Region. These services include:

- Surveillance of vaccine preventable diseases and their presence in Waterloo Region, including adverse events following immunization
- Inventory management and distribution of vaccines to health care providers (e.g. hospitals, physician offices) in Waterloo Region, including vaccine storage and handling, and efforts to promote vaccine safety and efficacy;
  - Includes inspections of all refrigerators in Waterloo Region that store publicly funded vaccine
- Administering hepatitis B and meningococcal vaccines to grade 7 students and human papilloma virus (HPV) vaccine to grade 8 female students in Waterloo Region schools (herein referred to as the School Immunization Program);
- Enforcing the Immunization of School Pupils Act by ensuring students are up-to-date as per mandatory immunizations in Ontario’s publicly funded immunization schedule;

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Collecting and maintaining the immunization records of children enrolled in licensed child care centres;
Clinic-based services;
Implementing the annual Universal Influenza Immunization Program; and
Health promotion activities and services for health care providers and community partners, including, but not limited to family physicians, pharmacies, hospitals, long-term care homes, and members of the public.

This report highlights data on vaccine preventable diseases in Waterloo Region, and provides an overview of VPD’s programs and services over the 2011 to 2014 time period to improve immunization rates, and prevent the acquisition and transmission of vaccine preventable diseases.

Accountability agreement indicators will also be highlighted. These are used by the Ministry of Health and Long-Term Care (MOHLTC) to monitor public health performance in different program areas. These were introduced in 2011 and set out specific performance expectations and reporting requirements for boards of health. As of 2014, the Vaccine Preventable Diseases Program was accountable for six of the 16 health protection accountability agreement indicators. Refer to Appendix B for a full list.

2.0 Surveillance Snapshot

The Ministry of Health and Long-Term Care mandates each health unit to conduct surveillance of reportable infectious diseases. This section highlights surveillance findings for confirmed reportable vaccine preventable diseases in Waterloo Region. For a full assessment please refer to the Waterloo Region Annual Infectious Disease Report (2014) at http://chd.region.waterloo.on.ca/en/researchResourcesPublications/reportsdata.asp#INFECTIONSDISEASES

Key surveillance findings include:
- Influenza was the most commonly reported vaccine preventable disease. While rates varied each season, the local incidence rate was consistent with or lower than the provincial rate in the 2011-2012, 2012-2013 and 2013-2014 influenza seasons.
- Local incidence rates of invasive pneumococcal disease have been decreasing since 2012; however, rates are generally higher than the provincial average
- There were five cases of invasive meningococcal disease in 2011; however, no cases were reported in 2012, 2013 or 2014
- Pertussis incidence rates increased in 2012, which was consistent with an increase in the provincial rate. The Waterloo Region cases were sporadic and not associated with an outbreak. The local incidence pertussis rates were consistent in 2011, 2013 and 2014 and generally lower than or similar to provincial rates
- Mumps incidence rates were stable (and low) between 2011 and 2014
• Age-standardized varicella ambulatory care visit rates decreased from 2011 to 2013 and increased slightly in 2014 but remained lower than the previous 5-year annual average (2009-2013)
• Since 2012, local incidence rates of hepatitis B (acute cases) have been significantly lower than the provincial rate
• There were no confirmed cases in Waterloo Region from 2011 to 2014 for the following vaccine preventable diseases:
  o Diphtheria
  o Haemophilis Influenza b disease (invasive)
  o Poliomyelitis (acute)
  o Measles
  o Rubella
  o Tetanus

An adverse event following immunization (AEFI) is defined as, “any untoward medical occurrence in a vaccine which follows immunization and which does not necessarily have a causal relationship with the administration of the vaccine. This could include an unfavourable and/or unintended sign, laboratory finding, symptom or confirmation of disease.”

Reporting AEFIs is essential for monitoring the safety of vaccines administered in Ontario. Health care providers, including Public Health, are required under the Health Protection and Promotion Act to report any suspect AEFI to the VPD Program for investigation and follow-up by a public health nurse.

The total number of suspect AEFIs investigated in 2013 and 2014 ranged from 15 to 30. There were 642 reports provincially in 2013 and 538 in 2014. Ontario’s Annual Report on Vaccine Safety (2014) noted that vaccines administered in Ontario resulted in a low rate of reported adverse events. However, the same reports indicates that AEFIs are under-reported by health care professionals in Ontario so the actual number of AEFIs locally and provincially is likely higher. Public Health Ontario, the Ministry of Health and Long-Term Care and the VPD Program continue to promote the importance of AEFI reporting.

3.0 Vaccine Management, Distribution, Storage, and Handling

Ontario’s publicly funded immunization schedule provides a list of routine immunizations for children and adults that are offered free of charge to eligible residents. The Ministry of Health and Long-Term Care purchases vaccines from manufacturers and makes it available to public health units through the Ontario Government Pharmaceutical and Medical Supply Services (herein referred to as Ontario Government Pharmacy). Health

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units are then responsible for managing local vaccine inventory, and distributing vaccines to all health care providers in their jurisdiction that offer publicly funded immunizations to their clients (e.g. primary care providers, hospitals, long-term care homes). In addition, health units are responsible for ensuring all vaccines are handled and stored appropriately. In Waterloo Region, these services are managed by Public Health’s Vaccine Preventable Disease (VPD) Program.

According to the Ontario Public Health Standards, it is the responsibility of the VPD Program to:
- Maintain an adequate inventory of vaccine to meet the needs of health care providers administering publicly funded vaccines
- Return reusable vaccines and non-usable (wasted) vaccines that cannot be administered to Ontario Government Pharmacy
- Ensure vaccines are properly stored and handled at Region of Waterloo Public Health facilities, and maintain a contingency plan in the event of a refrigerator failure
- Distribute vaccines to all health care providers who administer publicly funded vaccine, and monitor vaccine practices
- Continually monitor the temperatures of refrigerators within Waterloo Region (350+) that store publicly funded vaccine by receiving and reviewing monthly temperature logs
  - Ensure the appropriate temperatures (+2°C to +8°C) are maintained
- Educate primary care providers on proper vaccine storage and handling, and ensure refrigerators are monitored and refrigerator temperatures remain between +2°C to +8°C
- Receive and investigate reports of cold chain incidents (refer to Section 3.2.1), assess if the vaccine can be used or should be marked as non-usable, and report incidents to the Ministry of Health and Long-Term Care
- Inspect health care provider premises that store publicly funded vaccine to assess vaccine storage and handling practices
  - Each facility (and refrigerator) is inspected annually
  - Additional inspections (e.g. after a cold chain incident) may be conducted as required

The VPD Program’s work to meet these OPHS requirements is highlighted in the next section.

3.1 Vaccine Distribution, Storage, and Handling

To ensure its OPHS requirements are met, the Vaccine Preventable Disease Program orders vaccine weekly from Ontario Government Pharmacy. As mandated, a two month supply of vaccines, as determined by historical ordering processes, is maintained at all times. This ensures vaccine is readily available to providers that need it, but also works to mitigate wastage in the event of a cold chain incident. Inventory is monitored by staff on a daily and weekly basis.
The VPD Program also maintains an ordering system for health care providers that administer publicly funded vaccine. Providers submit their orders, via fax, to the Program. Before processing an order, VPD staff ensures the provider has submitted a temperature log (of daily temperatures from the previous month) for each refrigerator where vaccines will be stored, and ensure temperatures fell within the acceptable range. If there are no concerns after careful analysis of temperature logs, ordering trends, and available inventory, the order will be filled. If there are any concerns regarding safe vaccine storage in any given facility, an investigation will be initiated and recommendations provided. Ordering will only be re-initiated once an investigation is complete and staff are confident in the provider’s ability to safely store and handle vaccines. This includes a requirement that seven days of appropriate temperatures have been maintained for the refrigerator in question.

Vaccine is distributed to each provider via licenced medical courier who ensures cold chain is maintained during the delivery process. This excludes rabies vaccine orders, which are processed by a nurse and are transported by a Public Health Inspector or licensed medical courier directly to a clinic or health care provider. If a vaccine has spoiled or expired, the product is returned by the health care provider to the VPD Program via medical courier.

During this time period, there were approximately 200 health care providers, including physician offices, long-term care homes, and retirement homes that ordered and received publicly funded vaccine from the VPD Program. This excludes pharmacies which can only participate in the Universal Influenza Immunization Program (refer to Section 8.0). Over the 2011-2014 time period, vaccine orders were delivered to vaccine providers as they were received.

3.2 Vaccine Management

3.2.1 Cold Chain Incidents

Cold chain refers to the materials, equipment and procedures used to maintain vaccines in the required temperature range of +2 °C to +8 °C from the time of manufacture until the vaccines are administered to individuals\(^5\). A cold chain incident occurs when vaccine is exposed to a temperature outside the required temperature range of +2 °C to +8 °C for any period of time, and the potency of the vaccine is potentially compromised\(^5\).

Cold chain investigations are conducted when an incident is reported to the VPD Program. As part of the investigation, a public health nurse will:

- Determine the cause of the cold chain incident;

• Assess whether vaccine can still be used by the health care provider or needs to be returned to Ontario Government Pharmacy; and
• Provide recommendations to health care providers if clients who have been immunized with compromised vaccine need to be re-immunized.

In addition, the nurse provides follow-up education to office staff and/or physician in order to prevent the occurrence of future incidents and ensure that adequate cold chain conditions can be maintained prior to continuing the vaccine supply to the health care provider. VPD Program staff will also follow-up with a letter on investigation findings and recommendations to prevent future incidents that are sent to the health care provider. Incidents are also reported to the Ministry of Health and Long-Term Care.

The VPD Program investigated 100 per cent of cold chain incidents reported between 2011 and 2014.

### 3.2.2 Refrigerator Inspections

Accountability agreement indicators are used by the Ministry of Health and Long-Term Care (MOHLTC) to monitor public health performance in different program areas. These were introduced in 2011 and set out specific performance expectations and reporting requirements for boards of health. In 2013, the Ministry introduced an indicator that monitored the number of refrigerators storing publicly funded vaccine in Waterloo Region that were inspected by the VPD Program\(^6\). As per the OPHS, these inspections are conducted by VPD nurses annually.

Table 1: Percentage of Refrigerators Storing Publicly Funded Vaccine in Waterloo Region Inspected by the Vaccine Preventable Disease Program

<table>
<thead>
<tr>
<th>Year</th>
<th>% of Refrigerators Inspected</th>
<th># of Refrigerators Inspected</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>88.7%</td>
<td>321</td>
<td>n/a</td>
</tr>
<tr>
<td>2014</td>
<td>96%</td>
<td>356</td>
<td>95%</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2013-2014

Baseline data was collected in 2013 where 88.7 per cent of refrigerators storing publicly funded vaccine in Waterloo Region were inspected. A target was set for 2014 (95%), which was surpassed when 96 per cent of refrigerators were inspected that year. Refer to Table 1. Targets in future years (2015 and beyond) have been set at 100 per cent.

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3.2.3 Vaccine Wastage

An additional area of focus in the OPHS is monitoring and reducing vaccine wastage. To monitor health unit wastage two accountability indicator agreement indicators were established:

- % of HPV vaccine wasted that is stored/administered by the public health unit
- % of Influenza vaccine wasted that is stored/administered by the public health unit

Baseline data was calculated in 2010. In 2010, 2012 and 2013, indicators were measured by calendar year. This was changed to school year/influenza season (September 1 to August 31 reporting cycle) in 2014-2015. Tables 2 and 3 present Public Health’s results.

Table 2: Percentage of HPV Vaccine Wasted that is Stored/Administered by Region of Waterloo Public Health, 2010 to 2014-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>% of HPV vaccine wasted</th>
<th>Target</th>
<th>Provincial Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0.3%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2012</td>
<td>0.9%</td>
<td>0.3% or lower</td>
<td>0.2%</td>
</tr>
<tr>
<td>2013</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.3%</td>
</tr>
<tr>
<td>2014-2015</td>
<td>1.2%</td>
<td>0.5%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2010-2014

HPV vaccine wastage rates were generally stable between 2010 and 2013 (less than one per cent). There was a slight increase in 2014-2015. This was a result of a human error which occurred when Panorama, a new information system to maintain immunization records, was introduced. The error was quickly identified and additional staff training resulted in no other incidents of this type.

Table 3: Percentage of Influenza Vaccine Wasted that is Stored/Administered by Region of Waterloo Public Health, 2010 to 2014-2015

<table>
<thead>
<tr>
<th>Year</th>
<th>% of influenza vaccine wasted</th>
<th>Target</th>
<th>Provincial Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>0%</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>2012</td>
<td>2.6%</td>
<td>Maintain 2010 rate</td>
<td>0.8%</td>
</tr>
<tr>
<td>2013</td>
<td>3.5%</td>
<td>1.3%</td>
<td>2.6%</td>
</tr>
<tr>
<td>2014-2015</td>
<td>0.8%</td>
<td>1.5%</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2013-2014

Influenza vaccine wastage rates increased from 2010 to 2013 and decreased in the 2014-2015 influenza season. The increases were a result of human error. Various

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process and other improvements were made to improve wastage rates, and the rate decreased to 0.8 per cent in the 2014-2015 influenza season. The program will work to maintain or improve this rate in subsequent reporting cycles.

Additional wastage indicators will be implemented in future years (refer to Section 10.0).

4.0 School Immunization Program

A core component of the Vaccine Preventable Disease Program is the School Immunization Program. From 2011 to 2014, Public Health nurses administered three vaccines to grade 7 and grade 8 students enrolled in Waterloo Region Schools. Hepatitis B and meningococcal conjugate ACYW-135 vaccines are given to all grade 7 students. Human papilloma virus (HPV) immunization is given to grade 8 female students. The hepatitis B and HPV immunizations are recommended (voluntary) while the meningococcal vaccine is mandatory for all students enrolled in school as per the Immunization of School Pupils Act (refer to Section 5.0).

The immunization schedule for the School Program immunizations is listed in Table 4.

Table 4: School Immunization Program Schedule (2011 to 2014)\(^8\)

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Grade and gender</th>
<th># of doses</th>
<th>Vaccine intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Papillomavirus</td>
<td>Grade 8</td>
<td>2 dose</td>
<td>1(^{st}) dose: grade 8 2(^{nd}) dose: 1(^{st}) dose + 6 months</td>
</tr>
<tr>
<td></td>
<td>Females(^9)</td>
<td>series</td>
<td></td>
</tr>
<tr>
<td>Meningococcal conjugate ACYW-135</td>
<td>Grade 7 students</td>
<td>Single</td>
<td>1(^{st}) dose: grade 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dose</td>
<td></td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>Grade 7</td>
<td>2 dose</td>
<td>1(^{st}) dose: grade 7 2(^{nd}) dose: 1(^{st}) dose + 6 months (4 months if Recombivax vaccine; 6 months if Engerix vaccine)</td>
</tr>
<tr>
<td></td>
<td>students</td>
<td>series</td>
<td></td>
</tr>
</tbody>
</table>

The vaccines were administered in rounds. In Round 1, which occurs between September and December of each calendar year, the first HPV, the first hepatitis B and the meningococcal immunization is given. In Round 2, which occurs between March and June of each calendar year, the second hepatitis B and second HPV vaccines are administered.

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\(^8\) This schedule was introduced in the 2015-2016 school year. Previous to this school year, 3 doses of HPV immunization were required for full protection.

\(^9\) This schedule is for females 9 to 13 years of age. Females 14 years of age or older follow a modified schedule where 3 doses are required for full protection.
From 2011 to 2014, the VPD Program offered the School Immunization Program in approximately 190 publicly funded, private and parochial schools. Due to the decommissioning of an old, and onboarding of a new, information system, School Immunization Program coverage rates from 2011-2012 to 2013-2014 are generally not reported. Estimated coverage rates for the 2014-2015 school year, and the number of students immunized by VPD Program nurses, are highlighted in Table 5.

Table 5: Estimated Coverage Rates and Number of Students Immunized, 2014-2015 School Year

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Estimated Coverage Rate</th>
<th>Estimated # of Students Immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>77%</td>
<td>4,606 (per dose)</td>
</tr>
<tr>
<td>Meningococcal conjugate ACYW-135</td>
<td>86%</td>
<td>5,141</td>
</tr>
<tr>
<td>HPV</td>
<td>55%</td>
<td>1,661 (per dose)</td>
</tr>
</tbody>
</table>

Notes: Data extracted from Panorama on September 17, 2015. Includes students born in 2002 for hepatitis B and meningococcal immunization, and students born in 2001 for HPV immunization. Excludes students immunized after July 1, 2015.

5.0 Immunization of School Pupils Act

In order to ensure students are receiving important immunizations to protect their health, and the health of the community, the Ministry of Health and Long-Term Care enacted the Immunization of School Pupils Act.10 The Act requires that all children attending school between ages four to 17 be immunized for several immunizations in Ontario's publicly funded immunization schedule. Prior to the 2014-2015 school year these mandatory immunizations included: diphtheria, tetanus, polio, measles, mumps and rubella. The legislation and associated regulations were updated in advance of the 2014-2015 school year, which resulted in three additional vaccines being added to the ISPA: pertussis, meningococcal (infant and grade 7 dose) and varicella (for students born January 1, 2010 or later).

Students and/or parents of students (up to 17 years of age) are required to report all immunizations to the VPD Program. They are encouraged to do this each time their child is immunized, so that the records can be kept continually up-to-date. Individuals who are medically unable to be immunized or are opposed to immunization for religious/conscience beliefs, must have an exemption notice completed by the required official, and submit it to Public Health. Hard copies of exemptions are entered into the Panorama, the provincial information system and kept on file.

Under the Vaccine Preventable Diseases Standard and Immunization Management Protocol (2013) in the Ontario Public Health Standards, the VPD Program is required to

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enforce the Immunization of School Pupils Act by assessing and maintaining immunization records of school pupils (students) each school year. Over the 2011-2014 time period, the VPD Program enforced the ISPA in the Waterloo Region District School Board and the Waterloo Catholic District School Board. Previous to 2011, junior and senior kindergarten students were not included in the enforcement process. The VPD Program added these students from 2011 onward to achieve compliance with the OPHS. The Act is not currently enforced in French-language school boards, private, and parochial schools.

As part of the assessment process, the Program determines which students have not submitted a record of immunization or valid exemption for the mandatory immunizations in Ontario’s publicly funded schedule. These students/parents will receive a notice stating their immunization record is not up-to-date and to please submit the record to Public Health. Table 6 presents the number of immunization notices mailed home by the VPD Program each school year over the 2011 to 2014 time period.

Table 6: Number of Notices Sent to Students/Parents of Students in Past Four School Years

<table>
<thead>
<tr>
<th></th>
<th>2014-2015 School Year</th>
<th>2013-2014 School Year</th>
<th>2012-2013 School Year</th>
<th>2011-2012 School Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary School</td>
<td>10,497</td>
<td>4,041</td>
<td>4,115</td>
<td>4,365</td>
</tr>
<tr>
<td>Secondary School</td>
<td>9,918</td>
<td>4,142</td>
<td>4,076</td>
<td>5,224</td>
</tr>
<tr>
<td>Total</td>
<td>20,415</td>
<td>8,183</td>
<td>8,191</td>
<td>9,589</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2011-2014

The number of notices mailed home decreased over the 2011-2013 time period, but dramatically increased (149%) in the 2014-2015. This is a result of the introduction of the three new immunizations to the ISPA, particularly meningococcal vaccine.

The final part of the assessment process is to suspend students (from school) who do not respond to the immunization notice mailed home (as per Table 6 above). Official suspension orders are prepared by Program staff (as per the Associate Medical Officer of Health) and delivered to students, in-person, via the school principal. Previous to 2011, orders were issued a day before suspension day. In 2011, process improvements were initiated to reduce the number of students suspended from school. From 2011 onward, orders were issued one week in advance to give parents/students additional time to be immunized and/or submit their record of immunization or exemption to the VPD Program.

Most individuals who receive an immunization notice and suspension order follow-up accordingly. There is, however, a proportion of the population that does not respond and is suspended from school for up to 20 school days or until the appropriate record or exemption is filed with the VPD Program. Figures 1 and 2 present the percentage of the
student population that was suspended (on the first day) from elementary and secondary schools over the 2010-2011 to 2013-2014 school years.

Figure 1: Percentage of Elementary School Students Suspended Under the ISPA, 2011-2012 to 2013-2014 School Years

Source: Vaccine Preventable Disease Program Data, 2011-2014

The VPD Program suspended approximately one per cent of the elementary student population over the 2011-2012 to the 2013-2014 school years. This equates to approximately 600 suspensions in the 2011-2012 school year to 526 suspensions in the 2013-2014 school year. Most, if not all, students returned to school before the end of the 20 day suspension period.

The number of students suspended was higher in 2010-2011 as junior and senior kindergarten students were added to the ISPA enforcement process that year.
Secondary school suspensions decreased from 2011 to 2014. In the 2010-2011 school year, 2.8 per cent of the secondary student population was suspended. This decreased to two per cent in the 2013-2014 school year. This equates to 795 suspensions in the 2010-2011 school year and 582 suspensions in the 2013-2014 school year. Most, if not all, students returned to school before the end of the 20 day suspension period.

The number of students suspended is fairly low compared to the number of immunization notices mailed home. This is a significant amount of information for Program staff to administratively process in a short period of time (four to five months).

Suspension data for the 2014-2015 school year is not available as the ISPA was not enforced by Public Health that year. VPD Program did not suspend students from school that year. Enforcement activities were modified that year due to:
- Data quality issues related to the introduction of Panorama, a new information systems used by all public health units to maintain and assess student immunization records; and
- The need to provide parents/students additional time to adjust to introduction of the three new vaccines to the ISPA.

Suspension for most immunizations will resume in the 2015-2016 school year and for all mandatory immunizations in the 2016-2017 school year.

The ISPA ensures high immunization coverage rates in the student population which, in turn, protects the health of the community. The most recent coverage rate data is from the 2012-2013 school year:
- For students seven years of age enrolled in public and catholic elementary schools
Coverage rates for diphtheria, tetanus, and polio were approximately 89 per cent

- Ninety-two per cent (92%) had the two required doses of measles and mumps
- Ninety-five per cent (95%) had the one required dose of rubella

For students 17 years of age enrolled in public and catholic elementary schools

- Coverage rates for diphtheria and tetanus were approximately 87 per cent
- The coverage rate for polio was 94 per cent
- Approximately 92 per cent had the two required doses of measles and mumps
- Ninety-five per cent (95%) had the one required dose of rubella

Waterloo Region’s coverage rates for students seven years of age are higher than the provincial average. Local coverage rates for students 17 years of age are higher or equal to provincial coverage rates for diphtheria, tetanus and polio. They are slightly lower (1 to 2 per cent) for measles, mumps and rubella.

Data is not available for subsequent years due to the transition to Panorama. Coverage rate reporting will resume in the winter of 2016-2017.

The implementation of Panorama required a significant investment of staff and operating resources to implement. Through this period some one time funding was provided to the health units to off-set some of the costs. Planning for Panorama was initiated in 2012 and implementation occurred in July 2014.

### 6.0 Child Care

From 2011 to 2014, the VPD Program worked to comply with the Day Nurseries Act and the associated requirements in the Ontario Public Health Standards. Under the Day Nurseries Act, children attending licensed child care centres were required to be immunized according to their age for select vaccines in Ontario’s publicly funded immunization schedule. The required vaccines were determined by the Medical Officer of Health. In Waterloo Region, this included diphtheria, tetanus, pertussis, polio, measles, mumps, rubella and Haemophilus Influenza type B.

Proof of immunization was provided at the start of enrollment. When children were registered for child care, the provider of the child care centre collected and forwarded a copy of the child’s immunization record to the VPD Program. As per the Act and OPHS, the Program collected and maintained these immunization records (by entering them into Panorama).

The Program is reviewing the feasibility of assessing records in the future so that staff are able to contact parents and advise them of incomplete immunization records.
The Child Care and Early Years Act\textsuperscript{11} was passed in 2014 and replaced the Day Nurseries Act in August 2015. No significant changes to immunization programs and services resulted from this updated legislation. A review of regulations is currently underway.

7.0 Clinical Services

7.1 Routine Immunization Clinics

The VPD Program offers routine immunization clinics to individuals who do not have a primary care provider. Clinic hours varied from 2011 to 2014. A divisional reorganization implemented in 2010 increased the number of clinics offered in response to a local situation where significant numbers of citizens were without the services of a primary care practitioner. Clinic appointments were available each Tuesday, Wednesday and Thursday from 9 a.m. to 7 p.m. in Public Health’s Waterloo clinic and Noon to 8 p.m. each Tuesday in Public Health’s Cambridge clinic. In 2014, the Tuesday clinic in Waterloo was eliminated. This was done as local data indicated more Waterloo Region residents had health care providers and it permitted resources to be redeployed to other program activities.

The number of visits to the routine immunization clinics was generally stable between 2011 and 2013 with over 2,500 visits each year (refer to Figure 3). There was a decrease in clinic visits in 2014 given the elimination of one day of clinic appointments that year; although, over 1,700 clients still received service from the VPD Program.

Figure 3: Number of visits to the Routine Immunization Clinic by Year, 2011-2014

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{Year} & \textbf{Number of Visits} \\
\hline
2011 & 2769 \\
2012 & 2937 \\
2013 & 2505 \\
2014 & 1722 \\
\hline
\end{tabular}
\caption{Number of visits to the Routine Immunization Clinic by Year, 2011-2014}
\end{table}

Source: Vaccine Preventable Disease Program Data, 2011-2014

\textsuperscript{11} Child Care and Early Years Act, S.O. 2014, c. 11. Accessed March 17, 2016 from http://www.ontario.ca/laws/statute/14c11
7.2 Multi-Cultural Immunization Clinic

The multi-cultural immunization clinic is targeted to immigrants and new Canadians. The clinic is offered the second Monday of every second month (February, April, June, etc.) at the YMCA’s Immigrant Services office in Kitchener. Translators are available onsite during the clinic to assist clients in completing the paperwork, and communicating with the VPD Program nurses administering vaccines.

The number of visits to the multi-cultural immunization clinic is presented in Figure 4. Visits have decreased since 2012 (for reasons unknown), but were consistent in 2013 and 2014. Data is not available for 2011.

Figure 4: Number of visits to the Multi-Cultural Immunization Clinic by Year, 2012-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>314</td>
</tr>
<tr>
<td>2013</td>
<td>141</td>
</tr>
<tr>
<td>2014</td>
<td>156</td>
</tr>
</tbody>
</table>

7.3 School Program Catch-Up Clinic

The school program catch-up clinic is offered to individuals who:
- Were absent the day the School Immunization Program was offered
- Did not have a completed consent form the day the School Immunization Program was offered (and attempts to reach the parent were unsuccessful)
- Previously declined school immunization, but are now interested in receiving the vaccine (subject to provincial eligibility criteria)

Individuals requiring hepatitis B and HPV vaccine may be referred to the primary care provider for immunization, if their provider chooses to offer these immunizations for their clients and if the clients meet provincial criteria.

From January 2011 to September 2012 the school program catch-up clinics were integrated with the routine immunization clinics. Due to the number of students requiring school program immunizations, a specific catch-up clinic was initiated each Thursday.
from Noon to 8 p.m. in early September 2012. This continued until January 2014 when the clinic time was changed from 1:15 p.m. to 8 p.m.

The number of visits to the clinic was consistent between 2011 and 2013. The number of visits decreased in 2014. This is a result of reduced clinic hours (described above) and less clinics being offered due to the implementation of Panorama and resources being reassigned (i.e. during the enforcement of the Immunization of School Pupils Act).

Figure 5: Number of visits to the School Immunization Program Catch-Up Clinic by Year, 2011-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>School immunization program catch-up clinic visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1038</td>
</tr>
<tr>
<td>2012</td>
<td>1229</td>
</tr>
<tr>
<td>2013</td>
<td>1018</td>
</tr>
<tr>
<td>2014</td>
<td>560</td>
</tr>
</tbody>
</table>

7.4 Immunization of School Pupils Act Clinics

As part of the Immunization of School Pupils Act enforcement process, the VPD Program offers walk-in immunization clinics to students requiring immunization and are unable to obtain an appointment with their health care provider or wish to drop off their immunization record in-person.

From 2011 to 2014 appointments were offered on a drop-in basis once immunization notices were mailed home. Clinics were held every Monday and Friday in Waterloo and every Friday in Cambridge. Clinics were held daily once suspension orders were issued (one week before suspension day), and ended three business days after suspension day.

7.5 Travel Clinic

Since 1992, Public Health’s travel clinic operated as a cost-recovery clinic where expenses (staffing, vaccine, etc.) were recovered through administrative and vaccine fees. The VPD Program assumed responsibility for this clinic in the 2010 divisional reorganization. In 2011 and 2012, the Program completed a review of the clinic and determined:
• An increased number of private sector providers were offering travel health services;
• A majority of family physicians offer travel-related services to the patients; and
• Clients attending travel clinic had more complex medical histories increasing the time required to complete an appointment (making cost recovery difficult to achieve)

As a result, VPD management and staff recommended the closure of the travel clinic on January 1, 2014. The recommendation was approved by Region of Waterloo Community Services Committee on May 29, 2012.

While the travel clinic closed on January 1, 2014, the VPD Program still provides information to individuals seeking travel health information. The Public Health website lists available travel clinics in the area, including clinic location and phone number. In addition, the public can contact the VPD information line if they do not have internet access or have general questions.

Given the closure announcement, visits to the travel clinic decreased from 2,977 in 2011 to 95 in 2014.

8.0 Universal Influenza Immunization Program

Since its introduction in 2000, the VPD Program has implemented Ontario’s Universal Influenza Immunization Program (UIIP) which offers influenza vaccination free of charge to all persons six months of age and older who live, work or go to school in Ontario. According to the National Advisory Committee on Immunization (NACI), approximately 10-20% of Canadians contract influenza each year. The UIIP aims to:

• Provide individual protection against influenza
• Reduce the number and the severity of influenza cases
• Reduce the impact on the health care system during the influenza season
• Decrease the overall economic impact in both direct healthcare costs and indirect societal costs

Each year the influenza vaccine is changed to protect against the strains of influenza that are determined to be the most likely to circulate during the upcoming influenza season. These strains are determined each February by the World Health Organization (WHO).

Organization of the vaccine release and all associated communication/promotion materials is coordinated with the Ministry of Health and Long-Term Care. A significant amount of VPD program activity between July and December of each year is devoted to:

• Learning about the vaccines (as they change in number and composition each year);
• Training Public Health nursing staff on administration of that year's vaccine;
Preparing and distributing information on the vaccine to health care providers that administer the product;
Organizing Public Health’s community immunization clinics;
Preparing and releasing materials promoting the vaccine to the public;
Determining how much product each provider will receive in the first two vaccine shipments (as demand exceeds supply at the start of each influenza season); and
Managing the UIIP vaccine inventory.

In 2011, the influenza vaccine was available to the public through their primary care provider, Public Health clinics, and in various other settings such as long-term care homes, workplaces, hospitals, and community health centres. In 2012, the Ministry introduced a significant change to the UIIP by allowing pharmacists to administer influenza vaccine to individuals 5 years of age or older. This increased the number of providers administering vaccine and ultimately provided residents additional options to obtain their annual flu shot. Refer to Table 7. This resulted in an increase in program workload as there were a significant number of additional inspections to conduct, increased vaccine distribution, more refrigerators to monitor, and more providers to assist by answering questions and troubleshooting. The province provided one time funding to off-set the cost of nursing salaries to onboard the pharmacies to the UIIP program.

Table 7: The Number of Health Care Providers Offering Influenza Vaccine, 2011-2012 to the 2014-2015 Influenza Seasons

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician’s Offices</td>
<td>N/A</td>
<td>157</td>
<td>148</td>
<td>151</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>0</td>
<td>21</td>
<td>82</td>
<td>98</td>
</tr>
<tr>
<td>Long-term Care Homes</td>
<td>25</td>
<td>25</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Retirement Homes</td>
<td>23</td>
<td>23</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Health Care Agencies</td>
<td>12</td>
<td>10</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Community Health Centres</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Educational Institutions</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Public Hospitals</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Workplaces</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Correctional Facilities and Youth Justice Facilities</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total number of distributors</td>
<td>n/a</td>
<td>243</td>
<td>303</td>
<td>322</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2011-2014

As more health care providers offered influenza vaccine, Region of Waterloo decreased the number of community influenza immunization clinics it offered. Clinics were costly to run, and Ministry reimbursement did not cover all costs to offer the clinics in community
settings. In addition, the VPD Program introduced criteria to attend its clinics, and focused on children under 5 years of age and their family members. This was introduced because, due to provincial policy, pharmacists were not able to immunize young children. Further, the Program started offering appointments in Public Health’s clinics, and implemented an online booking system so clients could book an appointment rather than drop-in, where wait times can vary and staffing requirements were difficult to predict. Public Health has received positive feedback regarding the online booking system and the change to scheduled appointments.

As planned, this change decreased the number of clients directly immunized by Public Health. The goal was to re-direct individuals to their primary care provider or pharmacist and allow Public Health to focus its clinics to specific target populations, and deploy resources to the enhanced activities related to the introduction of pharmacies to the UIIP. Refer to Table 8 which presents the number of influenza vaccines administered at Public Health community and office flu clinics from 2011 to 2014. This includes clinics held at local universities.

Table 8: Number of Influenza Immunizations Administered by Public Health, 2011-2012 to 2014-2015 Influenza Season

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Clinics</td>
<td>11,635</td>
<td>8,769</td>
<td>4,485</td>
<td>4,010</td>
</tr>
<tr>
<td>Clinics at Public Health</td>
<td>n/a</td>
<td>657</td>
<td>455</td>
<td>483</td>
</tr>
<tr>
<td>Total</td>
<td>11,635</td>
<td>9,426</td>
<td>4,940</td>
<td>4,493</td>
</tr>
</tbody>
</table>

Source: Vaccine Preventable Disease Program Data, 2011-2014

9.0 Health Promotion

The Vaccine Preventable Disease Program provides a variety of services to support health care providers in administering vaccine to their clients and provide up-to-date information on vaccine-related issues. These Public Health services include:

- Responding to questions and concerns of health care providers through a dedicated phone line (operated Monday to Friday, 8:30 a.m. to 4:30 p.m.);
- Providing information and resources on Public Health’s website;
- Developing and distributing physician advisories on urgent matters of public health importance in order to provide guidance on vaccine administration, handling, inventory, management, and storage;
- Developing and distributing fact sheets on vaccine preventable diseases;
- Hosting physician forums when appropriate; and
• Providing information (when necessary) through Public Health’s physician newsletter, Physician’s Update or through special mail outs (i.e. introduction of a new vaccine to the publicly funded schedule)

In addition, the Program:
• Attends/presents, on current vaccine-related topics, at Infection Control Forums for long-term care and retirement homes organized by the Infectious Disease and Tuberculosis Control Program
• Attends/presents, on immunization reporting requirements, at an annual forum for child care providers organized by the Children’s Services Division
  o All forms for child care providers are easily accessed on Public Health’s website

For the general public, the VPD program operates a dedicated phone line where residents can call to book appointments, ask questions, etc. A separate line is dedicated to parents/students submitting immunization records. Both lines are operational Monday to Friday, 8:30 a.m. to 4:30 p.m. Education materials are also available on Public Health’s website.

10.0 Future Directions

The VPD program continues to be a priority of the Ministry of Health and Long-Term Care. Over the last 14 years, the program has experienced continuous program expansions and enhanced accountabilities. There have been significant changes to the information systems supporting the management of student immunization records, enhanced management requirements for vaccine storage and distribution practices, and an increase to the number of publicly funded vaccines added to Ontario’s publicly funded immunization schedule. The VPD Program reviews and modifies its programs and services on an ongoing basis. This section reviews future directions for the Program.

Overall, the VPD Program is undergoing, and will continue to implement, a program re-engineering. This is a requirement to effectively manage and prioritize resources in the constantly changing and growing program. This initiative will review existing processes, identify opportunities for improvement, and prioritize and implement those accordingly. A list of activities included in the re-engineering are highlighted below.

10.1 Vaccine Management, Distribution, Storage, and Handling

Program staff will initiate enhanced tracking of cold chain incidents to better understand why they occur, so efforts can undertaken to reduce vaccine wastage. This will include the reason for the failure and improved follow-up with health care providers. The number of refrigerator inspections will be based on risk categories or criteria (under development). An initiative aimed at reducing the number of failures, and thereby vaccine wastage, will also be explored. The initiative will be evaluated for its effectiveness and outcomes.
The Program will also work to achieve accountability agreement targets for refrigerator inspections and vaccine wastage. The Ministry of Health and Long-Term also announced a new accountability agreement for 2016 — percentage of MMR vaccine wastage. This indicator will include percentage of wastage of publicly funded measles, mumps, and rubella (MMR) vaccine that is stored, transported, or administered by PHUs and health care providers. This is the first indicator that will consider vaccine wastage beyond the health unit’s direct control.

10.2 School Immunization Program

Public Health will work on increasing immunization rates for the three immunizations included in the School Immunization Program to ensure disease rates remain low.

The Ministry of Health and Long-Term Care continually reviews this program. Recent changes include the reduction in number of HPV vaccine required to obtain full protection (from three to two doses). In April 2016, the Ministry of Health and Long-Term Care announced that HPV immunization will be provided to grade 7 males starting in the 2016-2017 school year. In addition, HPV immunization provided to females will be transitioned from grade 8 to grade 7 in that same school year.

10.3 Immunization of School Pupils Act Enforcement

Public Health continually works to reduce the number of suspension orders issued each year. After modifications to the enforcement process in the 2014-2015 and 2015-2016 schools years, the Program will return to a full enforcement process for all mandatory immunizations in 2016-2017. Process improvements will be implemented in the 2015-2016 school year and beyond to improve ISPA-related immunization coverage rates and reduce the number of students suspended.

The VPD Program will also explore the feasibility of enforcing the Immunization of Schools Pupils Act in French language and private schools in Waterloo Region.

The Ministry of Health and Long-Term also announced two new ISPA accountability agreements for 2016:
- % of 7 or 8 year old students in compliance with ISPA
- % of 16 or 17 year old students in compliance with ISPA

Baseline data will be calculated in 2016 and targets will be set for 2017 and beyond.

10.4 Child Care

Currently, the VPD program collects and maintains immunization records of children enrolled in licenced child care facilities. The feasibility of assessing these records and

12 This includes issuing suspension orders far in advance of the official suspension date, and piloting ISPA-related immunization clinics in catholic secondary schools.
following-up (e.g. immunization notice) with parents of children of incomplete records will be assessed.

10.5 Universal Influenza Immunization Program

The VPD Program will continue with its current plan to assume a stewardship role in Universal Influenza Immunization Program (UIIP) implementation. This means the Program will continue to shift its focus from administering vaccine to supporting health care providers in their efforts to immunize their clients and the general public.

The Ministry of Health and Long-Term Care is evaluating the UIIP through 2016. This may result in changes to the program.

10.6 Health Promotion

The VPD Program will collaborate with the Infectious Diseases and Tuberculosis Control Program on a health promotion initiative that will work to increase pneumococcal immunization rates, in an effort to decrease the presence of disease in the community.

10.7 Panorama

The VPD Program will continue to implement the Immunization and Inventory Modules in Panorama. Opportunities to use the system to its fullest capability will be explored.

Finally, the Ontario Public Health Standards are currently under revision, which could result in the implementation of modifications or enhancements to current public health services over the next few years.
Appendices

Appendix A

Board of Health Outcomes for the Vaccine Preventable Diseases Standard:

- The board of health achieves timely and effective detection and identification of children susceptible to vaccine preventable diseases, their associated risk factors, and emerging trends.
- The board of health achieves timely and effective detection and identification of priority populations facing barriers to immunization, their associated risk factors, and emerging trends.
- The board of health is aware of and uses epidemiology to influence the development of healthy public policy and its programs and services to reduce or eliminate the burden of vaccine preventable diseases.
- The public is aware of the importance of immunization across the lifespan.
- Health care providers report adverse events following immunization to the board of health.
- Health care providers are knowledgeable of improved practices related to proper vaccine management, including storage and handling.
- Target coverage rates for provincially funded immunizations are achieved.
- The board of health effectively responds to vaccine preventable disease outbreaks.
- The public is aware of the availability of travel health services, including immunizations for travellers.
- Health care providers adhere to proper vaccine management, including storage and handling practices and inventory management.
- Vaccines are distributed in an equitable and timely manner that adheres to proper vaccine management, including storage and handling practices.
- The board of health achieves timely and effective detection and identification of adverse events following immunization.
- Children have up-to-date immunizations according to the current Publicly Funded Immunization Schedules for Ontario and in accordance with the Immunization of School Pupils Act and the Day Nurseries Act.
Appendix B

As of the end of calendar year 2014, Region of Waterloo Public Health is accountable to the Ministry of Health and Long-Term Care for 27 indicators (11 indicators categorized as ‘Health Promotion’ and 16 indicators categorized as ‘Health Protection’). The indicators are variable in terms of whether they are starting to gather baseline data, monitored for trends, or tracked against set targets.

Six of the 16 health protection indicators related to Vaccine Preventable Disease Program activities. The full list of indicators is below.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of refrigerators storing publicly funded vaccines that have received a completed routine annual cold chain inspection</td>
<td>Tracked indicator</td>
</tr>
<tr>
<td>% of school aged children who have completed immunizations for hepatitis B</td>
<td>Monitored for trends</td>
</tr>
<tr>
<td>% of school aged children who have completed immunizations for HPV</td>
<td>Monitored for trends</td>
</tr>
<tr>
<td>% of school aged children who have completed immunizations for meningococcus</td>
<td>Monitored for trends</td>
</tr>
<tr>
<td>% of vaccine wasted by vaccine type that is stored/administered by the Public Health Unit (Human Papillomavirus (HPV))</td>
<td>Tracked indicator</td>
</tr>
<tr>
<td>% of vaccine wasted by vaccine type that is stored/administered by the Public Health Unit (influenza)</td>
<td>Tracked indicator</td>
</tr>
</tbody>
</table>

Three additional accountability agreement indicators will be added in 2016:

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of wastage of publicly funded measles, mumps, and rubella (MMR) vaccine that is stored, transported, or administered by PHUs and health care providers</td>
<td>Baseline data</td>
</tr>
<tr>
<td>% of 7 or 8 year old students in compliance with ISPA</td>
<td>Baseline data</td>
</tr>
<tr>
<td>% of 16 or 17 year old students in compliance with ISPA</td>
<td>Baseline data</td>
</tr>
</tbody>
</table>