CITY OF HAMILTON
PUBLIC HEALTH SERVICES
Clinical & Preventive Services

TO:	Mayor and Members Board of Health
COMMITTEE DATE:	November 14, 2016
SUBJECT/REPORT NO:	Vaccine Program Update (BOH16053) (City Wide)
WARD(S) AFFECTED:	City Wide
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RECOMMENDATION

(a) That the Vaccine Program service delivery be managed through reallocation of existing budget and FTE in Public Health Services;

(b) That the Board of Health send a letter to the Ontario Minister of Health and Long-Term Care with copies to the Chief Medical Officer of Health and all Ontario Boards of Health to request adequate financial resources to fully deliver the Vaccine Program as described under the Ontario Public Health Standards and with a goal of increasing immunization levels in the community.

EXECUTIVE SUMMARY

The Vaccine Program provides services under the *Ontario Public Health Standards* (2008) (OPHS) and associated protocols of *Immunization Management* (2016) and *Vaccine Storage and Handling* (2016). These standards and protocols outline the requirements that boards of health must meet under the Public Health Funding and

Accountability Agreement (PHFAA), as well as targets for nine accountability indicators for compliance with legislation, immunization coverage and vaccine wastage. Over the past several years, the Vaccine program has experienced increasing pressures leading to non-compliance with the OPHS and PHFAA. These pressures include: implementation of a new provincially-mandated database to record the immunization records of all children attending child care centres and/or school (Panorama); requirement to screen immunization records for all children for every school year; increased requirements to provide immunizations in schools (e.g. HPV for boys), new vaccines (e.g. shingles), increased documentation requirements for vaccine administration and increased expectations related to monitoring vaccine inventory and wastage.

Immunization is one of the greatest successes of modern public health, but complacency is risky. Given the emergence of previously uncommon vaccine preventable diseases (e.g. measles), global travel and pockets of under-immunized or unimmunized people, immunization remains a priority for public health.

Immunization continues to be a priority for the Ministry of Health and Long-Term Care (MOHLTC). A number of recent reports, including the Auditor General of Ontario's *2014 Annual Report*, the MOHLTC's vision for Ontario's immunization system (*Immunization 2020)*, and the MOHLTC's *Patient's First: Action Plan for Health Care for Changing and Improving Ontario's Health System,* support the modernization of Ontario's immunization system. With the review and modernization of the OPHS currently underway, public health anticipates increased requirements for programs and services related to immunization over the next several years.

Recent increases to mandatory provincial programs (e.g. HPV for boys, shingles vaccine) have not been accompanied by any funding from the province. Being mindful of costs, Public Health Services (PHS) has attempted to manage these pressures within the program through continuous quality improvement process, realignment of work and partnerships. PHS is no longer able to maintain current services by managing resources within the program or the department budgets. The Vaccine Program has reported expenses over budget for the past three years. This variance has been partially mitigated through one-time funding or within existing PHS approved budget.

PHS has explored options to reallocate departmental resources to address gaps in the Vaccine program and remain within the departmental budget. These are not easy decisions, but through continuous quality improvement processes and prioritization exercises, PHS is able to address the needs of the Vaccine program while minimizing the impact on other programs and services. PHS is recommending reallocation of these resources based on priorities that include legislative requirements, need and impact on population health, organizational risks and benefits, public health expertise. While there will be some impacts within affected programs, these impacts are necessary to meet the legislated requirements for the Vaccine Program.

These reallocations will not bring us to full compliance, as described in detail in this report. PHS will be asking MOHLTC for further one-time funding in 2017. Ideally, MOHLTC should fund on an ongoing basis the added responsibilities that they have given to public health units. Further detail will be provided during the 2017 budget process.

PHS is recommending a reallocation of existing approved budget and FTE to manage the immediate pressures within the Vaccine program. In anticipation of the release of the new OPHS standards in 2017, the Vaccine program intends to submit a request for additional one-time and base funding from MOHLTC to support compliance for all required indicators.

Alternatives for Consideration – See Page 18

FINANCIAL – STAFFING – LEGAL IMPLICATIONS (for recommendation(s) only)

Financial: The Vaccine program has recorded budget pressures in the past three years up to $330,480 forecast for 2016. Pressures have been partially mitigated through one time funding to be used for specific work within the Vaccine Program (e.g. Panorama database implementation). The approved budget for 2016 is $1,667,040. After reallocation, the budget would be $2,105,812.

A one-time funding request of $336,000 was submitted to the MOHLTC to assist with the start-up of the new *Immunization of School Pupils Act* (ISPA) requirements for the 2016-2017 school year. The Vaccine program received $168,000 to be spent by March 31, 2017. This funding shortfall continues to create pressures in the Vaccine program to be compliant with required indicators.

In consultation with Finance and Administration, the reallocation of FTE is completely within the approved PHS budget. This reallocation will support maintenance of the current level of service delivery in the Vaccine program and take steps to more fully implement the requirements under the OPHS and PHFAA. Some requirements will continue to be unmet (e.g. full review of childcare records) until additional funding is provided by the MOHLTC.

Staffing: PHS has explored options using continuous quality improvement processes to support the difficult choices recommended in this report. Employee expenses are the most significant driver in the provision of clinical services including the need for specialized training to deliver immunization to students.

This report recommends that 4.01 FTE be reallocated to the Vaccine Program. PHS continuous quality improvement processes have identified and implemented new opportunities to provide services through initiatives, including online and social media,

realigning work that is better situated within the Vaccine program, and leveraging existing partnerships.

Legal: No implications.

HISTORICAL BACKGROUND (Chronology of events)

The following reports that relate to the work of the Vaccine Program have been presented for information and/or recommendation to the Board of Health and Audit, Finance and Accounting. These reports present information on program targets and indicators, efforts to improve service delivery in the community, as well as the expansion of eligibility for new publicly-funded vaccines.

- June 2013 Public Health Services Cold Chain/BIOS Program – AUD13020
- July 2014 Vaccine Program Update - BOH14025 (City Wide)
- April 2015 Accountability Agreement Indicators 2014 Year-End Results BOH15011 (City Wide
- April 2016 Accountability Agreement Indicators 2015 Year-End Performance BOH16012 (City Wide)
- July 2016 Human Papillomavirus Vaccine Expansion (2016 - 2017 School Year) BOH16031 (City Wide)
- September 2016 Shingles Vaccine Introduction and HPV Expansion – Information Update (City Wide)

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The Vaccine Program provides services to the community under the OPHS (2008, revised May 2016) which include the respective protocols for Immunization Management (2016) and Vaccine Storage and Handling (2016). These standards and protocols outline the minimum requirements that immunization programs must provide: assessment of immunization records for children enrolled in child care facilities and students attending schools, including the enforcement of the *ISPA*; provision of immunizations in school and community-based settings; storage and distribution of vaccines; investigation of adverse events following immunization; health promotion and policy development; and emergency preparedness.

Under the PHFAA, all Public Health Units (PHUs) in Ontario are required to report on the same set of performance indicators. Performance indicators involve priority areas for performance improvement and have targets that are negotiated between the PHU and the MOHLTC on an annual basis. The inability to meet performance targets is referred to as performance variance. Reporting on performance indicators is done twice annually with variance reports generated and submitted to the MOHLTC as required.

The Vaccine Program has nine indicators for which they are accountable:

1. % of human papillomavirus (HPV) vaccine wasted that is stored/administered by the public health unit,
2. % of influenza vaccine wasted that is stored/administered by the public health unit,
3. % of school-aged children who have completed immunizations for Hepatitis B,
4. % of school-aged children who have completed immunizations for HPV,
5. % of school-aged children who have completed immunizations for meningococcus,
6. % of refrigerators storing publicly funded vaccine that have received a complete routine annual cold chain inspection,
7. % of 7 or 8 year old students in compliance with the ISPA,
8. % 16 or 17 year old students in compliance with the ISPA, and
9. % of measles, mumps, rubella (MMR) vaccine wastage in the public health unit and by all external vaccine providers.

This report reviews the program's ability to achieve the above noted standards, protocols and accountability indicators and where challenges exist in meeting MOHLTC requirements.

RELEVANT CONSULTATION

Not applicable to this report.

ANALYSIS AND RATIONALE FOR RECOMMENDATION
(Include Performance Measurement/Benchmarking Data if applicable)

1. Assessment of Immunization Records

There are two requirements under the OPHS that pertain to the assessment of immunization records. These requirements stipulate the processes boards of health must comply with for assessing, maintaining and reporting on the immunization status of all children enrolled in child care centres as defined in the *Child Care and Early Years Act* (CCEYA) and children attending schools in accordance with the ISPA. These processes are outlined in the Immunization Management Protocol (2016). The purpose of this protocol is to provide direction and standardized practices among provincial boards of health.

Child Care Facilities

Boards of health are responsible to receive monthly enrolment information, as well as records of immunization and exemption provided by the parent for all children attending a child care centre. The vaccine program receives this information from child care operators; however, is not currently entering it into the provincial immunization database (Panorama) as required by the protocol due to inadequate resources. As such, the

program has not been able to review these records and/or send notices to parents to advise them of missing or incomplete immunization information. Records at this time are sorted by birth cohort and entered into Panorama by priority to align with school entry and/or ISPA screening efforts. In the event of outbreak, the program will enter and review the immunization records of all children and staff at that time and exclude from care as required.

PHS is not currently fully compliant with the OPHS requirements. Should the recommendation be approved, PHS will begin to take steps towards achieving compliance in this area; however, full compliance will only be achieved with additional funding.

School Students

Assessment of immunization records for students is done in accordance with the Immunization Management Protocol and the *Immunization of School Pupils Act* (RSO 1990 c. I. 1). Under the standards and protocol, health units are required to obtain immunization information from the parent and/or student for all students (JK to grade 12) who attend school in Ontario. The ISPA specifies the information required to be maintained by the PHU for the immunization record, responsibilities of school operators and the number of valid doses per type of vaccine required to be compliant with the regulation. There are nine different types of vaccine that are required for school entry under ISPA. These include: diphtheria, tetanus, pertussis (whooping cough), poliomyelitis, measles, mumps, rubella, meningococcal disease, and varicella (chickenpox).

Immunization information is entered into the provincial database (Panorama) and annually assessed to ensure that all students have the valid number of doses required for school attendance and/or a valid exemption form on file. Students with incomplete records or who are overdue for immunization are notified through an information notice, based on data generated by Panorama.

In Hamilton, following notification parents/students have approximately three weeks to provide this information to PHS. If this information is not received in the specified time frame, a second notice is sent (suspension order) stating that students may be suspended from school for up to 20 school days or until records have been forwarded to the board of health and assessed for up-to-date status or valid exemption. This information is requested to be submitted within two weeks before the suspension order takes effect. Students, who are suspended for incomplete immunization records, are readmitted to school once the record has been updated on the Panorama system. Parents/students are able to submit this information via phone, mail or fax, with a provincial on-line reporting tool expected to be released in 2017.

During the record review process, nurses are available to respond to parent/student inquiries on the phone related to vaccine and exemption requirements; advocate with their health care provider to retrieve immunization records; and to provide immunizations at community clinics to those without a family physician and/or at imminent risk of (or when) suspended from school.

The annual assessment of immunization records occurs in the fall through the spring. Since 2010, the program has only completed a partial assessment of student records; selecting specific birth cohorts and/or schools. With the planning and preparation for the implementation of the new Panorama system in 2014, the program limited screening in 2013 to two birth cohorts and no assessments were conducted in 2014. This component of the program was placed on hold so staff could clean up approximately 50,000 duplicate records created when the old provincial database was merged into Panorama.

Annual assessment of student records resumed in the 2015-2016 school year in a limited capacity for two birth cohorts (1998 and 2008) or approximately 12,000 student records. Of these, over 8,500 notices were sent home to request immunization records. The program issued 3,900 suspension orders to families that did not submit information within the required time frame. Of these, over 1,000 students were suspended from school, with the majority being rescinded and returning to school within one to three days.

The program received over 54,000 phone calls from parents and students in the 2015-16 school year as the program began to screen student immunization records. This is a significant increase from the 2014-15 school year which saw just over 24,000 incoming phone calls (see Table 1) and highlights the impact the assessment process has on staff resources required to update immunization records in the Panorama system.

Table 1: Incoming Phone Calls into Vaccine Records Queue Line – Comparison of 2014-2015 and 2015-2016 School Years

	School Year	
	2014-2015	**2015-2016**
September	580	3,538
October	2,142	3,122
November	1,428	3,306
December	1,078	3,790
January	1,672	5,750
February	2,292	6,254
March	2,192	8,362
April	1,834	7,776

	School Year	
	2014-2015	**2015-2016**
May	1,688	4,600
June	1,886	2,132
July	4,020	1,888
August	3,962	3,946
Total	**24,774**	**54,464**

This school year, 2016-17, the program is planning to assess over 57,000 immunization records for students in nine birth cohorts representing all elementary school children from grade 2 to grade 8 and secondary students in grades 9 and 11 (birth years 2000, 2002 to 2009); a three-fold increase. Though the program is screening a significant number of birth cohorts this school year, this still does not meet the requirements set out in the standards and protocols. Challenges that impact the ability of the program to screen all birth cohorts include:

- Complexity of the provincial database that requires highly trained staff to enter and retrieve information,
- Specialized roles to clear duplicate records,
- Importation of school board enrolment lists,
- Running complex reports, and printing notices and letters,
- Staff turnover, and
- Limited resources to support staffing levels required to do all birth cohorts due to increased call volumes, mail and faxes.

Though PHUs are required to screen every student that attends school, under the PHFAA, PHUs only report to the MOHLTC on the compliance percentage for two birth years. Last year (2015-2016), was the first year this report was required under the accountability agreement for the board of health. Results are shown in Table 2 below.

Table 2: Board of Health Performance Under Accountability Indicators 4.8 and 4.9

#	Indicator	2015-2016 Performance
4.8	% of 7 or 8 year old students in compliance with the ISPA	96.9%
4.9	% of 16 or 17 year old students in compliance with the ISPA	30.5%

Due to ambiguities in the provincial technical document, Indicator 4.9 showed low coverage for 16 or 17 year olds. This was because PHS, along with some other PHUs in Ontario, screened the 1998 birth cohort (17 years of age) and not the 1999 cohort (16 years of age) as required. However, as shown in Table 3, the high percentage for coverage for the 1998 cohort assessed in 2015-2016 compared to the 1999 cohort demonstrates the impact the ISPA process has for ensuring up-to-date records in Panorama.

Table 3: 1998 Birth Cohort Coverage Compared to 1999 Birth Cohort Coverage

Birth Year	Measles	Mumps	Rubella	Diphtheria	Tetanus	Pertussis	Polio	Meningococcal
1998	94.31%	94.10%	97.32%	78.39%	78.28%	77.84%	94.53%	93.16%
1999	88.69%	88.08%	90.05%	30.34%	30.61%	23.69%	88.20%	78.37%

PHS is not currently fully compliant with the OPHS requirements in this area. If the recommendation is approved, PHS will be able to sustain current levels of service in this area. Full compliance will only be achieved with additional investment.

2. Provision of Immunizations

Immunizations are provided by the PHU through school-based clinics and community-based clinics as stipulated by the OPHS to eligible persons.

Schools

A core component of the Vaccine Program is the provision of immunizations to Grade 7 and 8 students. Grade 7 males and females are eligible to receive immunizations to protect against hepatitis B (HB), meningococcal disease and human papillomavirus (HPV). Grade 8 girls remain eligible this school year for HPV vaccination while the HPV program is transitioned to a Grade 7 program only. Students who miss their vaccination at school are eligible to receive them the subsequent school year and/or according to perpetuity guidelines stipulated by the Ministry. While the HB and HPV immunization series are recommended (voluntary), the meningococcal vaccine is required as part of the requirements for ISPA as described in the previous section.

With the expansion of the HPV program to Grade 7 males (BOH16031), nurses this school year will offer immunizations to more students than in previous years with an estimated 19,000 students being eligible across 125 schools represented by the Public, Catholic, French and Private school systems.

In the 2014-2015 school year, nurses began to utilize the Panorama system at point of service to document immunizations provided at school clinics. This implementation presented challenges for program staff not only related to the application (i.e. staff training, consistency with data entry to produce meaningful reports, learning how to create and run reports to align with MOHLTC reporting requirements) but also for understanding the technology that comes with a mobile application (i.e. increased time for data entry compared to paper, establishing internet connectivity and VPN access).

Under the PHFAA, boards of health report on the number of students who have completed immunizations against HB, meningococcal and HPV. As Table 4 below demonstrates, there has been a decline in the number of students who have completed these immunizations since 2014.

Table 4: Board of Health Performance for School-based Immunization Program

#	Indicator	Baseline (2009-10)	2011-12	2012-13	2013-14	2014-15	2015-16
4.4	% of school-aged children who have completed immunizations for hepatitis B	74.1%	CBE	N/A	78.7%	73.0%	68.7%
4.5	% of school-aged children who have completed immunizations for HPV	55.2%	CBE	N/A	59.5%	56.2%	57.2%
4.6	% of school-aged children who have completed immunizations for meningococcus	88.1%	89.0%	90.8%	85.0%	80.6%	76.9%

Legend:

CBE Cannot Be Established – for reporting period data were available but results could not be.

N/A Not Applicable – for the reporting period there were no date / no report required.

The decrease in coverage reported is not believed to be solely the result of declining uptake but rather for several reasons. Firstly, the Panorama system that documents and records these immunizations at the point of administration calculates coverage differently than that of the old Immunization Records Information System (IRIS) that

counted a student as complete for age if they had never started their series thereby inflating the true coverage numbers.

Secondly, several schools during the second round requested changes to their previously scheduled clinic to accommodate school trips and events. The program made every effort to accommodate these requests but in some instances, these clinics are not able to be rescheduled and resulted in most students completing their series the following school year. Since the reporting period for the PHFAA aligns with the school year (September 1 to August 31), if students were not immunized at a community clinic in the summer, these students were considered incomplete until they completed their series in Grade 8.

PHS is the primary provider of these immunizations through schools. However, in certain circumstances, students who are unable to be immunized at school may receive their immunizations through their family doctor. Should the physician or parent not report the vaccination dates for the student, these doses will not be captured in the final report. Additionally, many individuals receive their hepatitis B immunizations through their physician as part of a series for travel. These students are not removed from the denominator of the MOHLTC report. Therefore, if the dates of these doses are not obtained by PHS, this will impact the coverage report by underestimating the immunization coverage.

Finally, the number of vaccinations that are administered in each round has increased. Nurses used to go into schools three times a year but due to budgeting constraints and efforts to become compliant with ISPA requirements, immunizations are now only offered twice a year. Despite scientific evidence to the contrary, there remains concern within the community about the co-administration of several vaccines simultaneously and as such parents/students are opting to delay some of these vaccines to a later date. As a result of perpetuity guidelines from the Ministry, students are able to delay immunizations for HB until the end of their grade 8 year and HPV until the end of their grade 12 year. Since PHFAA reports are run for the cohort associated with the corresponding grade, those students who delay their series do not get removed from the report, thus decreasing the overall coverage rate.

Community Clinics

PHS additionally offers immunizations on a monthly basis at three different locations in the City. These clinics primarily provide catch-up immunizations for vaccines administered in the schools and to those students who received an immunization notice as part of ISPA screening. Nurses at these clinics will also provide immunizations to individuals who do not have a family physician or provincial/federal health insurance plans. Due to the increased workload for the school-based clinics with the HPV expansion, the program has temporarily suspended monthly clinics and will resume

during ISPA suspension waves so that students can obtain the immunizations needed to avoid suspension or return to school as soon as possible.

Influenza immunizations are primarily administered through health care providers and pharmacies. PHS administers influenza vaccine to those who are unable to access vaccination through either of these providers. Additionally, a community influenza clinic continues to be offered by PHS annually in Ward 15 as passed in report BOH14025. This clinic will be offered this upcoming influenza season at Waterdown Secondary school on December 19 from 3:00 pm to 7:00 pm.

Finally, the Sexual Health and Harm Reduction programs provide immunizations to individuals who are at highest risk for hepatitis A, hepatitis B, HPV and complications from influenza. These immunizations are provided through PHS clinic locations, Street Health Clinic and the VAN/needle exchange program. Influenza vaccines are additionally provided by the Harm Reduction program in shelter locations across the City in the fall.

PHS is currently fully compliant with the OPHS requirements to provide immunization services in schools and community. If the recommendation is approved, PHS will be able to maintain current levels of service. If the recommendation is not approved, PHS will not be able to maintain current levels of service and may become non-compliant with OPHS requirements.

3. Vaccine Management

Under the OPHS, the board of health is required to ensure the storage and distribution of provincially funded vaccines to health care providers, promote vaccine inventory management in all premises where vaccine is stored including at the local health unit, and provide a comprehensive information and education strategy to promote these practices. The Vaccine Storage and Handling Protocol (2016), provides direction to PHUs in an effort to achieve greater standardization in the management of vaccine inventories to ensure proper storage and handling, strengthen quality assurance activities, and provide education strategies in an effort to minimize and reduce provincially funded vaccine wastage and promote vaccine safety and efficacy. Vaccine Management is divided into Inventory Control and Vaccine Storage and Handling practices.

Inventory

Within the last 12 years, the number of routine publicly funded vaccines has nearly doubled from 8 to 15 vaccines. A total of 22 different vaccines are publicly funded as part of routine and targeted high-risk immunization programs. PHS is responsible under the OPHS for the distribution of these vaccines to the health care community (primary

care providers, hospitals, long-term care, pharmacies) in the City of Hamilton. There are over 440 providers that order and receive provincially funded vaccine in Hamilton.

To ensure that vaccine is available when providers require it, the Vaccine Program orders and receives vaccine on a weekly basis from the provincial vaccine depot. No more than a two-month supply is maintained at PHS to ensure that product is distributed in advance of expiry dates and that vaccine wastage is minimized in the event of any fluctuations in prescribed storage conditions. Vaccines are generally required to be stored between +2°C and +8°C. Any fluctuation needs to be investigated and documented in Panorama as described in the section below. Additional measures to protect the integrity of the vaccine supply include monitoring vaccine inventory weekly, documenting refrigerator temperatures twice daily to ensure no fluctuations in storage conditions, twice annual inspection and cleaning from a certified refrigeration company, and ensuring all refrigerators are connected to a generator and alarmed by a remote monitoring company. PHS has also negotiated an agreement with McMaster Children's Hospital to store vaccine at their pharmacy facility in the event that the generator malfunctions.

The Vaccine Program maintains an ordering system for all providers that administer publicly funded vaccine. This inventory module in Panorama was implemented in July 2015 and helps to track vaccine inventory at the PHU and provider levels. Providers ordering vaccine are required to indicate their current inventory on hand, as well as submit a log documenting twice daily temperatures for each fridge where vaccine will be stored. This is to ensure that no more than a one-month supply is maintained at their facility and to ensure that temperatures are maintained within the acceptable range. Each order and temperature log is assessed by staff. If there are no concerns, then the order will be filled. If concerns are identified regarding safe vaccine storage, an investigation is initiated by a nurse and recommendations for remediation provided. The vaccine order will only be filled once staff are confident in the provider's ability to safely store and handle vaccines. In many instances, provider orders are held for seven days until the corrective actions are implemented and temperatures are shown to be stable. Vaccines that are deemed not viable after investigation are returned to PHS for processing in Panorama and are entered as wastage against the facility. To ensure that reports are accurate on an annual basis, vaccine wastage needs to be entered as it is returned. There is often a two-month delay in this information being entered into Panorama due to a lack of resources.

PHS coordinates the delivery of vaccines from its office to the individual provider through a medical courier of their selection. It is the provider's responsibility to assume any delivery charges for this service and to ensure vaccine is delivered under appropriate conditions and inform PHS of any concerns. All courier companies are provided training on provincial vaccine storage and handling guidelines and receive inspection by a nurse if they store vaccine in the facility.

As shown in Table 5, vaccine inventory distribution to health care providers steadily increased between 2011 and 2014, demonstrating the importance of strict inventory management control practices.

Table 5: Vaccine Distribution in Dollars – 2011 to 2016

2011	2012	2013	2014	2015
$10,190,623.32	$10,529,002.92	$10,553,109.11	$11,051,480.90	$11,055,619.26

Accountability for vaccine wastage under the PHFAA requires PHUs to report on the percentage of vaccine wasted that is administered/stored at the health unit. These targets are annually negotiated with the Ministry.

Table 6: Board of Health Performance for Vaccine Wastage by PHU

	HPV		Influenza	
	Target	Performance	Target	Performance
2012	2.3% (baseline)	3.9%	Not established for reporting period	
2013	Maintain or improve	0.7%	0.5% (baseline)	2.4%
2014	1.7%	0.8%	4.0%	13.1%
2015	1.6%	4.3%	3.0%	5.7%

While the implementation of the Panorama Inventory module helps to address issues identified with the negative performance variance reported for the 2014-2015 influenza season for influenza vaccine wastage and meet recommendations from the 2013 internal audit from Audit Services, it is not without its challenges. These challenges are related to the complexity of detail required by the system, time it takes to enter information to process vaccine orders and returns, and specialized training to create and run inventory movement reports.

The provincial Best Practices workgroup for the implementation of the Panorama Inventory module outlines the methods to be used when entering information into the system to ensure consistency among PHUs, to ensure accurate inventory control, and meaningful reports. These guidelines are continually updated and staff are finding it difficult to keep up with the changes due to the workload required to process vaccine orders and returns. The program strives to process orders within 24-hours; however because of the time it takes to enter an order or return into Panorama, the number of required fields, and the attention to detail have all increased from the previous system, most orders are now processed within 72 hours.

When staff are not able to follow-up on best practice guidelines, this impacts the data that is being entered into the system and thus the reports that are generated. Reports to understand vaccine inventory movement by public health, facility or by product are technically difficult to run and are often found to have errors. Though these errors are minimal they create additional work by staff to have a specialized understanding of why inventory numbers are not accurate. Staff are also required to review a 900-page MOHLTC document, complete testing and assignments in order to have author access to write and generate reports.

PHS is not currently fully compliant with OPHS and PHFAA requirements. Approval of the recommendation will allow PHS to become complaint with OPHS and PHFAA requirements.

Vaccine Storage and Handling

All providers of publicly funded vaccine are required to follow the Vaccine Storage and Handling Guidelines, and are provided reinforcement of these principles by a nurse prior to being able to store vaccine at their facility. Under the protocol, nurses conduct refrigerator inspections annually for every refrigerator in the City of Hamilton that store publicly funded vaccine against these guidelines using documentation created by the MOHLTC (see Table 7).

Table 7: Number of Refrigerators Requiring Inspection (2010-2015)

2010	2011	2012	2013	2014	2015
310	322	316	432	424	441

Facilities receive one of three ratings: pass, conditional or fail. Conditional passes require follow-up by the nurse within two weeks by phone or in-person to ensure required remediation has been fulfilled. For those facilities receiving a fail rating, vaccine is quarantined and a re-inspection occurs within one to two weeks. Under the PHFAA, every refrigerator storing publicly funded vaccine is required to be annually inspected (Table 8). This number has been steadily increasing since 2010.

Table 8: % of Refrigerators Storing Publicly Funded Vaccine that have Received a Complete Routine Annual Cold Chain Inspection

Year	Number of Refrigerators in Jurisdiction	Number of Refrigerators Inspected	Compliance Rate
2014	424	427	99.3%
2015	441	441	100%

Reasons for the increase in number of inspections include: more physician practices opening and/or closing, increased availability within hospitals and retirement homes, and the introduction of pharmacies into the influenza vaccine program. There are 116 pharmacies that will be participating in the Universal Influenza Immunization Program (UIIP) this upcoming influenza season. Since pharmacies must annually apply to be a part of the UIIP, these inspections are completed in the summer to align with provincial timelines so their application to the UIIP can be approved by the MOHLTC.

The addition of pharmacy inspections, as a MOHLTC condition for their participation in the influenza vaccine program, comes with no increase in resources. Though the MOHLTC provided one-time funds to support these inspections for the first three years, it is now the expectation of the MOHLTC to complete inspections and troubleshoot any temperature excursions or equipment malfunctions within the current program complement and operational budget.

Despite the increase in the number of refrigerators storing publicly funded vaccine, there has been decrease in the number of violations of temperature requirements reported to the program (see Table 9).

Table 9: Number of Temperature Violations Requiring Assessment by Staff (2010-2015)

2010	2011	2012	2013	2014	2015
144	165	158	193	163	145

However, given the large number of publicly-funded vaccines, every assessment is complex and time-consuming. Each time PHS is notified of/or discovers a temperature violation in the storage conditions of vaccines, a nurse is required to assess the viability of every product that has been stored in the refrigerator during that period, and make recommendations on whether the vaccine is useable or considered wastage. This assessment of viability is made in consultation with product manufacturers and provincial stability guidelines.

Reasons for temperature violations include power outages, fridge or equipment malfunction or human error. The program works closely with facilities to ensure that policies are closely adhered to and provides necessary education and support to ensure compliance. The decrease in the number of failures can be attributed to this education and support provided by program staff and the realignment of duties that created nursing positions that focus on vaccine storage and handling to ensure consistent enforcement of policy and guidelines.

This summer, the MOHLTC implemented a new module within Panorama to document temperature excursions associated with each facility that stores vaccines. The Adverse Storage Conditions (ASC) module, works in alignment with the Inventory module in Panorama so that there is better control of vaccine and communication between staff to ensure that vaccine orders are scrutinized or flagged before being filled. Though the module is more complex in its data entry, staff has worked diligently to implement this module over the summer. Implementation of quality assurance and auditing policies are currently being explored by the quality assurance Public Health Nurse (PHN) to ensure accurate documentation and implementation of Best Practices for the module.

PHS is currently fully compliant with OPHS and PHFAA requirements in this area. If the recommendation is approved, this will allow PHS to maintain compliance with a new accountability indicator that looks at wastage of measles, mumps, rubella (MMR) vaccine not just by PHS, but also by community health care providers. If the recommendation is not approved, PHS may not be able to be compliant with the new accountability indicator.

4. Adverse Events Following Immunization (AEFIs)

The monitoring of adverse events following immunization (AEFIs) is an important measure in evaluating vaccine safety. An AEFI is any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the administration of the vaccine. Under the OPHS, the board of health is required to monitor, investigate and document all suspected AEFIs that meet provincial reporting criteria and report these cases using the provincial reportable disease database (iPHIS). It is the PHU's responsibility to promote the reporting of AEFIs by health care providers in accordance with the *Health Protection and Promotion Act* (HPPA).

Table 10 shows the number of AEFI meeting provincial reporting criteria that were reported to the board of health for the last five years.

Table 10: Adverse Events Following Immunization Reported to Public Health (2011-2015)

2011	2012	2013	2014	2015
17	35	27	36	32

The Vaccine Program is currently able to meet its requirements under the OPHS for the investigation and reporting of AEFIs in Hamilton; however, increased efforts to promote reporting by health care providers are needed.

5. Health Promotion and Policy Development

Boards of Health are required to work with community partners to improve public knowledge and confidence in immunization programs by supplementing existing national/provincial communication strategies or developing local communication strategies. The OPHS identifies 10 topics that need to be addressed annually. The program primarily has used the City of Hamilton website to address many of these areas and encourages parents to call an intake line to address questions or areas of concern by parents and providers.

More recently, the program has begun to utilize social media to communicate messages such as participating in Facebook conversations mediated by the Family Health Division, and the production of a video that was posted on You Tube and circulated via the corporate Twitter account. Twitter is used to share MOHLTC communication campaigns and announcements about new and existing vaccine programs. Currently, the program is involved with several PHUs to fund the production of an animated, white-board video to address parental concerns and hesitancy towards vaccination. This video is expected to be completed by the end of 2016 and will be circulated and shared through many avenues to target the audiences of expectant parents, new parents and vaccine hesitant parents.

PHS is currently fully compliant with the OPHS requirements in this area. Approval of the recommendation will allow PHS to more fully address issues of vaccine hesitancy and health equity in Hamilton.

6. Emergency Preparedness

The Public Health Emergency Preparedness Program Standard outlines the requirements for the development of a contingency plan to deploy health unit staff capable of providing vaccine preventable disease outbreak management and control such as mass immunization in the event of a community outbreak.

As demonstrated in 2016 during the Syrian newcomer response, PHS was able to quickly implement an effective strategy to provide immunizations to Syrian newcomers. Similarly, the hepatitis A vaccination response and support at the local Costco demonstrates how PHS is able to work collectively in response to real and potential outbreaks of vaccine preventable diseases.

PHS is fully compliant with this OPHS requirement. Continuous quality improvement processes across the department are in place to ensure ongoing compliance in this area.

Appendix A contains a summary of the Vaccine Program areas of responsibility under the OPHS, whether or not PHS is compliant with the requirements and the impact of approving or not approving the recommendations in this report.

ALTERNATIVES FOR CONSIDERATION
(Include Financial, Staffing, Legal and Policy Implications and Pros and Cons for each alternative)

Should the reallocation of FTE and associated budget not be approved, the program will not be able to maintain current service levels (immunization in schools), which is a requirement of the OPHS and PHFAA. PHS will continue to review annually, through operational planning, how to best prioritize work within existing program FTE as it works towards full compliance with the OPHS and PHFAA.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Healthy and Safe Communities
Hamilton is a safe and supportive city where people are active, healthy, and have a high quality of life.

APPENDICES AND SCHEDULES ATTACHED

Appendix A – Summary of Vaccine Program Requirements and Anticipated Compliance Based on Recommendations

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Advisory Committee for Ontario's Immunization System Review. (March 2014). *Ontario's Publicly Funded Immunization System: Building on Today's Strengths, Innovating for the Future*. Retrieved from: http://health.gov.on.ca/en/common/ministry/publications/reports/immunization/docs/immun_sys_review_march2014_en.pdf

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