

TO: Chair and members of the Board of Health

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PREPARED BY: Marlene Jantzi-Bauman, Manager, Vaccine Preventable Diseases

APPROVED BY: Rita Sethi, Director, Community Health & Wellness

Original signed document on file

SUBMITTED BY: Dr. Nicola J. Mercer, MD, MBA, MPH, FRCPC
Medical Officer of Health & CEO

Recommendations

It is recommended that the Board of Health:

1. **Receive this report for information.**

Key Points

- From July to December 2016, Wellington-Dufferin-Guelph Public Health (WDGPH) provided the total value of \$4,445,444.81 of vaccine to community partners in Wellington, Dufferin and Guelph (WDG).
- From July 2016 to December 2016, WDGPH had a total wastage rate of 5.6% of vaccine by dose.
- WDGPH has successfully implemented a comprehensive inventory and monitoring system to mitigate internal vaccine wastage
- WDGPH remains committed to working with our community partners to reduce the rate of individual vaccine wastage to < 5% annually and to reduce overall wastage to <3% of total vaccine distributed

Discussion

Cold Chain

Vaccines can lose their effectiveness if they are not stored properly. The consistent storage of vaccines within a temperature range of 2° and 8° C is known as maintaining "cold chain." Cold chain begins with manufacturing, moves through government distribution channels, and ends

when the vaccine is administered. A vaccine is wasted if it is exposed to temperatures outside the appropriate range or expired before use. Vaccine wastage is a significant and preventable liability.

Vaccine Distribution

WDGPH receives a weekly shipment of publicly-funded vaccine from the Ontario Government Pharmacy (OGP). Public Health is mandated to distribute this vaccine to physician's offices, long-term care homes, hospitals, community clinics and group homes. From July to December 2016, WDGPH provided the total value of \$4,445,444.81 of vaccine to community partners in WDG.

Vaccine Wastage

In order to most accurately reflect wastage, the overall wastage data presented were collected from the final two quarters of 2016. From July 2016 to December 2016, WDGPH had an overall wastage rate of 5.6% of vaccine by dose.

The Ministry of Health and Long Term Care (MOHLTC) provides the Vaccine Storage and Handling Protocol 2016 (Protocol). This Protocol was developed to achieve greater standardization in the management of provincial vaccine inventories, to ensure the proper storage and handling of vaccines, to strengthen quality assurance activities, to provide education strategies in an effort to minimize and reduce provincially-funded vaccine wastage and to promote vaccine safety and efficacy.¹ This Protocol requires that Health Units have no more than 5% wastage for any individual vaccine product annually and that overall vaccine wastage will be within the MOHLTC prescribed 3% of total vaccine distributed – measured quarterly.

Public Health is mandated to report any publicly-funded vaccine deemed as wastage and return it to the MOHLTC. The Panorama Inventory Management Module, implemented in 2015, has allowed WDGPH to monitor and track vaccine distributed to community partners with greater accuracy. WDGPH uses the Panorama Inventory system to assist community partners in managing vaccine ordering and inventory in ongoing efforts to decrease unnecessary wastage.

Accountability Indicators

In addition to overall vaccine wastage monitoring, WDGPH has 3 specific accountability indicators related to vaccine wastage, reported annually to the MOHLTC. The indicators in Figure 1 relate to the effectiveness of vaccine storage, handling and management practices by the public health unit and health care providers. There are significant opportunities for cost savings by employing efforts to reduce vaccine wastage, setting the stage for vaccine wastage reduction as priority for the MOHLTC. The Protocol, requires that vaccine wastage should not exceed 5% for any one product.¹

- Indicator 4.1 monitors the percentage of HPV vaccine wasted that is stored/administered by the public health units
- Indicator 4.2 monitors the percentage of influenza vaccine wasted that is stored/administered by the public health unit, health care providers & pharmacies
- Indicator 4.7 monitors the percentage of wastage of publicly-funded measles, mumps and rubella (MMR) vaccine that is stored, transported or administered by public health units and health care providers

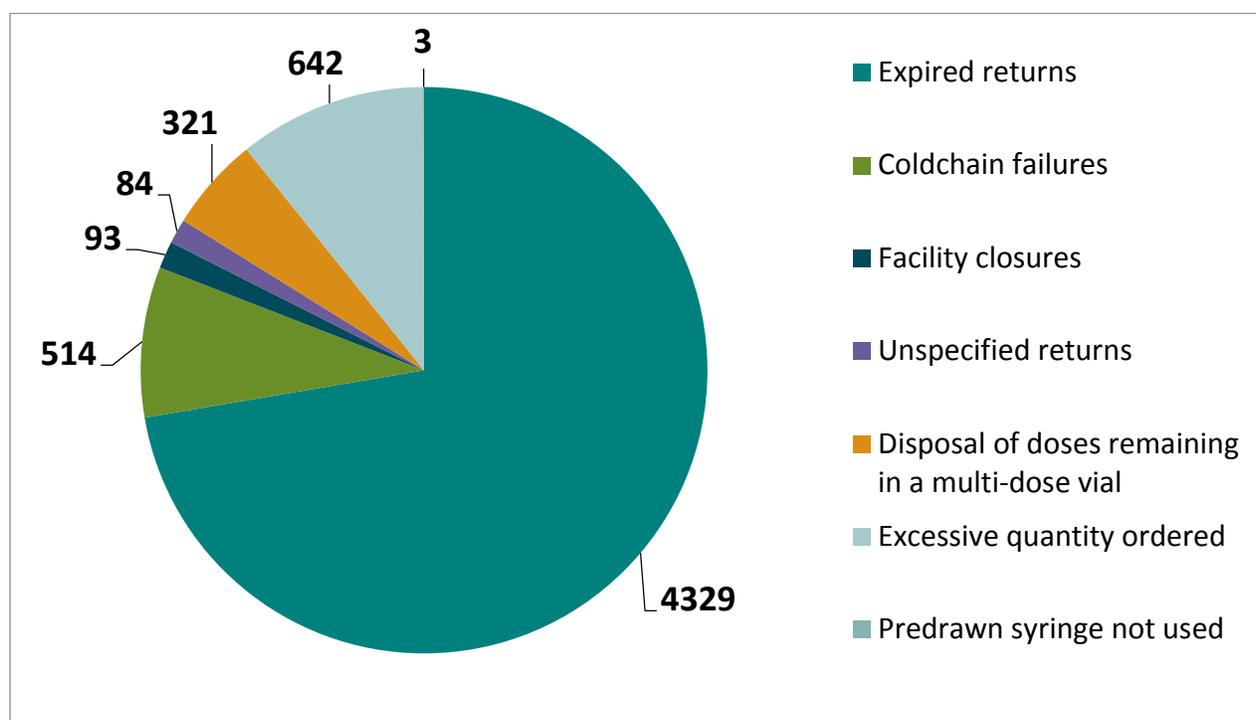
Figure 1. Wastage related accountability indicators reported in 2016

Accountability Indicators 2016	MOHLTC requirement for wastage	Wastage % < 5%
4.1 HPV vaccine wastage	< 5%	0.4 %
4.2 Influenza vaccine wastage	< 5%	8 %
4.7 MMR vaccine wastage	< 5%	3.5%

Challenges and strategies for mitigation:

A portion of the > 5% overall wastage report may be attributed to community partners returning vaccine from previous year(s) rather than during the same year that the vaccine was distributed. Pharmacies offering influenza vaccines are experiencing a learning curve in regards to appropriate cold chain/inventory management and contribute overwhelmingly to the amount of influenza vaccine returned as wastage to WDGPH. Figure 2 below outlines the rationale provided for wasted vaccine returned to WDGPH by healthcare providers in the latter half of 2016 in cases where vaccine wastage exceeded 5% for an individual vaccine.

Figure 2. Vaccines returned to WDGPH with a >5% wastage rate



WDGPH closely monitors vaccine orders that come in from facilities by requesting an accurate count of office inventory on the order form. Distribution is then adjusted accordingly. Sometimes the inventory on hand is not accurately recorded, resulting in providers ordering more stock from WDGPH than they can use before it expires. Once vaccine is distributed to an external provider, it cannot be returned to WDGPH and redistributed.

Additionally, some health care providers are accustomed to ordering influenza vaccine based on the numbers of doses given in previous years. However, the distribution trend for influenza vaccine continues to shift with an increased number of doses ordered and administered by pharmacists. WDGPH consistently reminds all health care providers to order only a 2 week supply of any vaccine in order to minimize the potential for wastage.

The WDGPH Cold Chain team has increased efforts to engage community partners in putting increased attention on vaccine cold chain management. Measures taken to reduce wastage include:

- Annual cold chain inspections for all facilities (an accountability indicator);
- Spot inspections following cold chain incidents;
- Education as per the Protocol is provided to healthcare providers at time of a cold chain incident and at annual inspections;
- Recommend and encourage community partners to invest in vaccine specific fridges that hold temperatures better and are less likely to fail than an inexpensive mini fridge;
- Limit vaccine stock in facilities with ongoing issues through the Panorama inventory system;
- Stickers with reminders to return expired vaccine with each new order, report fridge temperatures outside the 2 and 8 degree range and rotate vaccine inventory are added to every order distributed;
- During on-site cold chain inspections, healthcare providers are reminded to order a maximum of a 2 week supply and return expired vaccine immediately;
- The Cold Chain team will ask for expired vaccine at the time of inspection as well in order to prevent wastage being collected over extended time periods; and
- Collaboration with the Provincial Panorama group to develop guidelines for monitoring vaccine in the community, addressing issues such as vaccine expiry and vaccine quantity stored.

Over the past several years, WDGPH has developed a highly effective process for internal vaccine and cold chain management. Weekly inventory counts are completed in each office and internal stock requisitions are adjusted accordingly. During these inventory counts, vaccine expiry dates are checked and those vaccines with an approaching expiry date of 3 months or less are flagged for immediate use and redistribution. Currently, our school and community clinics pose one of the greater risks for vaccine wastage given that vaccine must be stored in portable coolers that are dependent on an array of ice and gel packs to stabilize temperatures. To manage this risk for community clinics, WDGPH is looking to trial a cooling system that is guaranteed to keep vaccine within the recommended temperature range for up to 65 hours. These cooling systems will also aid in power outages, emergency responses and fridge failures. WDGPH has also set additional monitoring requirements for on-site vaccine fridges including a comprehensive Hoboware monitoring system.

The Hoboware system was implemented in 2015. This system provides connection information in 10 minute intervals and records data every 5 minutes. Each fridge has 2 sensors. One monitors the fridge temperature and the other sensor monitors the voltage. Vaccines must be stored within the temperature range of +2°C to +8°C. When temperatures go outside the range of 2°C - 7°C an audible alarm is initiated and messages are sent to pre-determined WDGPH staff. This alarm range provides enough time to transfer vaccine if needed to another fridge and/or trouble shoot to why the temperature is too high or too low. Notifications are also provided when the sensors have missed a connection and are not relaying information to the

Hoboware. All alarms are emailed and phoned in to the appropriate WDGPH staff with the time of the incident, and related information such as temperature at time of alarm, voltage at time of alarm and/or time of missed connection. There is a contingency plan in place, 24 hours per day, to manage internally housed vaccine that might be at risk. Figure 3 provides an overview of the usefulness of this monitoring system from July 1 to December 31, 2016. No vaccine was wasted during this period due to out of range temperatures at the WDGPH offices.

Figure 3. Hoboware alarm system report

July 1 - December 31, 2016		
Office	Number of Alarms	Reason
Chancellor's Way Clinical	3	High temperature - highest temp of 7.14°C
Chancellor's Way Vaccine Room	48	Missed Connection or spike in temperature - highest temp of 8.49°C (vaccine removed prior to temperature reaching 8°C)
Fergus Office	5	High temperature - highest temp of 7.12°C
Shelldale Office	9	Missed connection or spike in temperature - low temperature of 1.97°C
Orangeville Office	4	Missed connection or spike in temperature - highest temp of 7.07°C
Shelburne Office	1	Voltage alarm
Mount Forest Office	2	Missed connection
Total Alarms:	72	

Conclusion

WDGPH has gone above and beyond MOHLTC recommended processes to eliminate vaccine wastage within our control. While WDGPH has successfully implemented internal processes to protect our vaccine supply, the challenge lies with engaging our community healthcare providers to acknowledge the importance of vaccine cold chain and inventory management. WDGPH is working closely with front line health care providers to improve the awareness of and adherence to the guidelines for proper vaccine storage.

Ontario Public Health Standard

Vaccine Preventable Diseases

Goal: To reduce or eliminate the burden of vaccine preventable diseases

Board of Health Outcomes:

- Health care providers are knowledgeable of improved practices related to proper vaccine management, including storage and handling.
- 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.

WDGPH Strategic Direction(s)

Check all that apply:

Health Equity

We will provide programs and services that integrate health equity principles to reduce or eliminate health differences between population groups.

Organizational Capacity

We will improve our capacity to effectively deliver public health programs and services.

Service Centred Approach

We are committed to providing excellent service to anyone interacting with Public Health.

Building Healthy Communities

We will work with communities to support the health and well-being of everyone.

Health Equity

Vaccines can lose their effectiveness when exposed to light or temperatures outside +2°C and +8°C range. WDGPH inspects all facilities storing publicly-funded vaccines to ensure vaccines retain their potency and to reduce wastage of publicly-funded vaccines.

Appendices

None.

References

1. Population and Public Health Division, Ministry of Health and Long-Term Care. Vaccine Storage and Handling Protocol 2016.

http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/vaccine_storage_handling.pdf