

Program/Service Information Report

Vaccine Wastage for 2022

Jan 2022 – Dec 2022

To: Chair and Members of the Board of Health

Meeting Date: March 1, 2023

Report No.: BH.01.MAR0123.C06

Prepared By: Karen Mulvey, RN, MN, CIC
Manager, Vaccine Preventable Disease Program

Approved By: Rita Isley, RN, MPA
Director of Community Health and Chief Nursing Officer

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

Key Points

- January to December 2022, Wellington-Dufferin-Guelph Public Health (WDGPH) distributed \$8,917,529.22 in vaccine (excluding COVID vaccine) to community partners in Wellington, Dufferin, and Guelph (WDG).
- January to December 2022, WDGPH had a combined internal/external wastage rate of 8.4% (excluding COVID vaccine).
- WDGPH internal vaccine wastage was 3.8% (excluding COVID vaccines).
- WDGPH saw an increase in wastage due to the suspension of vaccine returns during the COVID pandemic.
- 220, 744 COVID-19 vaccine doses were administered in WDGPH, and the combined internal/external COVID-19 wastage was 10.695%
- 100% of 237 vaccine refrigerator inspections were completed.

Program Requirements

Compliance with OPHS and Accountability Indicators:

In compliance

Not in compliance. If not in compliance, provide additional information about the variance and how it will be addressed.

N/A

Highlights

Vaccine Distribution

WDGPH receives weekly shipments of publicly funded vaccine from the Ontario Government Pharmacy (OGP). Vaccine is distributed regularly to physician's offices, long-term care homes, hospitals and community clinics. WDGPH distributes publicly funded vaccines to all community healthcare providers, except pharmacists, who receive their vaccine directly from a Ministry of Health (Ministry) designated distributor. The only publicly-funded vaccine pharmacists currently carry, is influenza vaccine and COVID vaccine. WDGPH is accountable for reporting publicly funded vaccine wastage incurred by all health care providers, including pharmacists. WDGPH is also responsible for providing annual vaccine education, cold chain education, routine vaccine fridge inspections and responding to cold chain incidents.

Cold Chain

Vaccines require storage within a consistent temperature range of 2° and 8°C, known as maintaining "cold chain." Cold chain begins with manufacturing and ends when the vaccine is administered.

Vaccine Wastage (Excluding COVID-19 Vaccine)

A vaccine is wasted if it is exposed to temperatures outside the appropriate range or expires before it is used. Vaccine wastage in Ontario is a significant and preventable liability, affecting vaccine safety and efficacy. The Ministry provides the Vaccine Storage and Handling Protocol (2018) to standardize the management of provincial vaccine

inventories. The protocol outlines proper storage and handling of vaccines, quality assurance activities and strategies to reduce publicly funded vaccine wastage.¹ The protocol requires that WDGPH has no more than 5% wastage for any individual vaccine product annually. If wastage exceeds 5%, the Ministry specifies that additional inventory control measures shall be taken to reduce it.

Public Health is mandated to report any publicly funded vaccine deemed as wastage to the Ministry. WDGPH monitors and tracks vaccine distributed to community partners with greater accuracy using a provincial inventory system, called Panorama.

The overall wastage, in 2022, for all vaccines returned to OGP (Ontario Government Pharmacy) by WDGPH was 8.4% and valued at \$481,191.48. This is an increase of 4.2% from 2021. In 2021, the Ministry of Health suspended vaccine returns as everyone was responding to the COVID pandemic. Vaccine returns resumed at the end of 2021 and into 2022. Additionally, access to healthcare providers in 2021 were limited, again, due to the pandemic and therefore vaccines already in healthcare fridges expired before being utilized. These two factors contribute greatly to the significant increase in vaccine wastage in 2022. This results in a skewed distribution/wastage ratio. The province calculates vaccine wastage as vaccines distributed/vaccines wasted regardless of the year the vaccine was distributed or wasted. Wastage is calculated on doses distributed or year, vs wastage returned and processed in same year.

Part of the overall wastage rate includes vaccine that is wasted internally. WDGPH had an internal wastage rate of 3.8% in 2022. The internal rate reflects short dated vaccine’s received from the Ministry and vaccines that could not be returned in the Reusable Return window.

Figure 1. Annual comparisons of overall wastage

	2017	2018	2019	2020	2021	2022
\$ Value Wasted	\$193,584.57	\$297,760.64	\$251,645.18	\$40,381.78	\$151,999.10	\$481,191.48
Percentage of distributed vaccine that was wasted	4.2%	4.7%	3%	0.6%	4.2%	8.4%

The greatest risk for vaccine wastage is short-dated vaccine as well healthcare providers ordering excess quantities or stockpiling vaccine. An unpredictable factor in calculating wastage is that expired vaccines are not always returned to WDGPH in the calendar year that they are distributed. Due to the limited control over when wasted inventory is returned to be counted, wastage rates for some individual vaccines may be higher than the number of vaccines distributed during that specific year. Influenza products are the most frequently wasted as demand for these seasonal vaccines comes from all providers, occurs over a relatively short period of time and has a short period for use.

Figure 2. Reasons for overall vaccine wastage (excluding COVID vaccine)

Excessive Quantity	0.1%
Cold Chain Incident - Malfunction: Refrig/Equip	0.1%
Unused Pre-drawn Syringe	0.04%
Expired Product	8.1%
Count Discrepancy	0.05%
Suspected Vaccine Contamination	0.01%

COVID-19 Vaccine Wastage

Public Health is mandated to report any COVID-19 vaccine deemed wastage through COVax, the provincial repository for COVID-19 vaccinations. The overall wastage for all COVID-19 vaccine distributed in WDGPH for 2022 was 10.695% In July of 2021, towards the end of the mass vaccination campaign, the province of Ontario advised that certain amount of wastage would be acceptable to vaccinate residents of Ontario.

The allowable wastage is related to multi dose vials (6-10 doses per vial) where not all doses could be given before expiry, and public perception on efficacy and safety of one COVID vaccine over another

Figure 3. Reasons for overall COVID-19 vaccine wastage

Damaged Product	0.004%
Defective Product	0.005%
Dose(s) Remaining in Punctured Vial Beyond 24 hours	0.012%
Stored in refrigerated temperatures (2-8 degrees C) beyond 30 days	3.283%
Dose(s) Remaining in a Multi-dose vial	0.038%
Insufficient Dose(s) From a Single/Multi-Dose Vial	0.061%
Vial Left at Room Temperature Beyond 12 hours	0.004%
Vial Left at Room Temperature Beyond 24 hours	0.014%
Suspected Vial Contamination	0.031%
Unused Pre-drawn Syringe	5.567%
Full Dose Syringe Use to Administer Half Dose	0.016%
Vaccine Administration Issue	0.022%
Vaccine Ancillary Supply Issue Causing Vaccine Wastage	0.007%

Community Cold Chain Excursions

WDGPH’s Cold Chain team completed 100% of 237 vaccine refrigerator inspections in 2022 and responded to 31 cold chain excursions. Follow-up to reported excursions involves collaborative resolution of the immediate cold chain issue and consultation with the vaccine manufacturer(s) with time and duration of exposure.

An assessment is made whether the vaccine can be used or must be wasted. Education on cold chain storage and handling is provided, where required. Re-inspections and unscheduled audits are conducted in cases where re-occurring issues are attributed to human error. Expired vaccine is still the most common cause for vaccine wastage in the community, rather than cold chain excursions.

Figure 4. Cold Chain Excursions

Reason for Excursion	Number of Excursions
Human Error – Improper Storage	1
Human Error - Refrigerator/Freezer Door Left Ajar	2
Human Error - Unmonitored Refrigerator/Freezer	2
Malfunction - Equipment	11
Malfunction – Refrigerator/Freezer	3
Unknown	9
Power Outage	2
Other	1

Challenges and Strategies

Vaccine distributed to health care providers cannot be returned for redistribution and any vaccine that cannot be used are wasted. Excess product ordering by community partners is difficult to control without adversely affecting client service and immunization coverage rates. WDGPH depends on community partners diligently monitoring their own vaccine supply and demand and ordering accordingly so as not to exceed a two-week supply of vaccine in their vaccine refrigerators. Inventory is difficult to control as supply and demand fluctuates weekly.

WDGPH monitors vaccine orders that come in from facilities by requesting an accurate count of office inventory on the order form or in the vaccine portal. Distribution is 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. WDGPH reminds health care providers to order a maximum two-week supply of any vaccine product to minimize the potential for wastage. Annual cold chain inspections are an accountability indicator, and WDGPH achieved a 100% completion rate.

Conclusion

WDGPH follows Ministry recommended processes to eliminate vaccine wastage. WDGPH continues to implement innovative measures aimed at decreasing vaccine wastage. In 2022, WDGPH completed 100% of the vaccine fridge inspections. During these inspections, all wasted and expired vaccines remaining at offices were collected and processed to OGP (Ontario Government Pharmacy).

Related Reports

BH.01.SEP0722.R16 - Vaccine Wastage for 2021.

https://wdgpublichealth.ca/sites/default/files/bh.01.sep0722.r16 - vaccine_wastage.pdf

References

1. Ontario Public Health Standards: Requirements for Programs, Services and Accountability.
https://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/protocols_guidelines/Ontario_Public_Health_Standards_2021.pdf
2. Vaccine Storage and Handling Protocol, 2018
https://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/protocols_guidelines/Vaccine_Storage_and_Handling_Protocol_2018_en.pdf