

# Immunization Requirements for Students Attending Schools in Wellington Dufferin Guelph Public Health

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**To:** Chair and Members of the Board of Health

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## Recommendations

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It is recommended that the Board of Health receive this report for information.

## Key Points

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- In Ontario, the *Immunization of School Pupils Act* (ISPA) requires proof of vaccination or a valid exemption to attend school for nine designated diseases: diphtheria, tetanus, polio, measles, mumps, rubella (German measles), meningococcal disease, pertussis (whooping cough) and varicella (chicken pox).
- Vaccine preventable diseases can be prevented through immunization programs, Wellington-Dufferin-Guelph Public Health (WDGPH) continues to provide and support access to immunizations for all students.
- Vaccination rates have decreased since the onset of the COVID-19 pandemic.
- WDGPH is focusing on getting vaccination rates for publicly funded vaccines up to and beyond the pre-pandemic rate to increase the health of the communities.

# Background

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Every year, global vaccination programs save millions of lives.<sup>1</sup>

The *Immunization of School Pupils Act* (ISPA) mandates that public health will assess, maintain, and report the immunization records for students attending primary or secondary school. There are nine designated diseases that require proof of vaccination or a valid exemption under the ISPA to attend school in Ontario, they include: diphtheria, tetanus, polio, measles, mumps, rubella, meningococcal disease, pertussis (whooping cough) and varicella (chicken pox).<sup>2</sup> This process helps assess the risks during outbreaks of vaccine preventable diseases in schools and childcare settings.

This report will review three of the nine designated diseases requiring immunization to attend school under ISPA, measles, polio, and meningitis to demonstrate the importance of vaccination in children and across the lifespan.

In Ontario the measles vaccine is provided in a combined vaccine for mumps, measles, and rubella ('German measles') – MMR – or measles, mumps, rubella, and varicella (chickenpox) – MMRV. The polio vaccine is provided in a combined vaccine that also protects against tetanus, diphtheria, and either pertussis or haemophilus influenzae Type B depending on the age it is given. The meningitis vaccine is a single vaccination and is typically provided to children after the age of one to protect against one strain and again in grade 7 to protect against 4 strains of the bacteria that cause meningitis.

In Ontario, people follow the publicly funded immunization schedule as recommended by the Ministry of Health and receive their first immunizations from their primary healthcare provider beginning at eight weeks of age.<sup>3</sup> By four years old, most children in Ontario will have received protection against approximately 12 vaccine preventable diseases.<sup>3</sup> Aside from annual flu and COVID vaccine, the next time that children are typically offered a vaccine is in the public health run grade 7 immunization program for protection against the human papilloma virus (HPV), hepatitis B virus (HB) and meningitis (Men-C-ACYW-135).<sup>3</sup> By high school, many students are due for their next tetanus, diphtheria, and pertussis booster, this is typically offered through their primary care provider or through public health in school clinics.<sup>3</sup> Once people graduate from high school they typically access immunization services through primary care and public health clinics.

## Measles

Measles is a highly transmissible vaccine preventable disease, the most common symptoms are a fever followed by a rash, however complications such as pneumonia can occur in 6-7% of reported cases, and encephalitis (brain inflammation), which can cause permanent brain damage, occurs in approximately 1 out of every 1000 cases.<sup>4,5</sup> Prior to measles vaccination most exposed children under the age of 15 contracted this disease, amounting to approximately three to four million cases annually in the United States.<sup>5</sup> Once the measles vaccination was introduced the annual number of cases in the United States decreased to 400-500 cases per year.<sup>6</sup> In 2019, alongside decreased measles vaccine coverage, there were over 1000 cases of measles reported in the United States, 89% were unvaccinated.<sup>7,8,9</sup>

Measles vaccination (MMR or MMRV) was introduced in North America in the 1960s and is included on the list of vaccines in the Immunization of School Pupils Act (ISPA) in Ontario.<sup>10</sup> A single dose of the measles vaccine administered at 12 to 15 months of age provides about 85 to 95% protection, after children receive their recommended second dose at the age of four protection from measles increases to almost 100%.<sup>11</sup>

In 2008, Ontario experienced a cluster of measles cases that included 9 cases in WDGPH, there were 166 unimmunized or under immunized students excluded from two schools and over 1000 contacts of cases were followed by public health and 50 MMR vaccine administered.<sup>14</sup>

In 2014, Ontario experienced another measles outbreak with 22 confirmed cases, all reported cases were related to travel and 70% of cases were unimmunized. In the past ten years there was only one case of measles reported in the WDGPH region, in an unimmunized adult who became infected while travelling.

## Meningococcal meningitis (*N. meningitidis*)

*Neisseria meningitidis* is a bacterium that is spread from person to person by close contact, often between household members or sexual partners, such as sharing utensils during a meal or kissing. The bacteria normally live in the nose and throat of healthy humans without causing illness; The bacteria are present in 10-35% of the population in the United States at any one time, with the highest percentage in those 20-24 years of age.<sup>15</sup>

Although the bacteria are usually harmless, certain genetic strains have been found to be more capable of causing severe illness.<sup>15</sup> Bacteria that enter the mucous membrane and blood stream can cause serious infection (meningococcal disease), and 50% of people with such an infection go on to develop meningitis, inflammation of the membranes surrounding the brain. Symptoms of meningococcal meningitis may include fever, headache, stiff neck, sensitivity to light and confusion, progressing, in some cases, to coma followed by death, which can occur in only a few hours after the onset of symptoms. In infants, the disease may present as inactivity, irritability, vomiting, disinterest in feeding, with, in some cases, noticeable bulging of the soft spot of the skull.<sup>16</sup>

Travelling to areas of the world where meningococcal disease and meningitis are endemic, such as parts of sub-Saharan Africa, being in a vulnerable age group, having certain underlying medical conditions, and living in crowded residential quarters (group settings), increase one's risk of contracting meningococcal meningitis. However, the risk can be greatly reduced by receiving the meningococcal conjugate vaccines, which were introduced as recommended childhood vaccines in the early 2000s.<sup>17</sup> These vaccines help to protect against several 'strains', called serotypes, of *N. meningitidis*, with men-C vaccines usually administered to children at 12 months of age followed by a conjugate vaccine against all four serotypes in Grade 7.<sup>18</sup> A fifth serotype of the bacterium, serotype B, is not included in the routine publicly funded childhood immunization schedule but is available at a cost.

The first meningococcal vaccine was introduced in the United States in 1978, followed by the modern conjugate vaccine in 2005. Since the introduction of these vaccines, the annual incidence of meningococcal meningitis in North America has declined to very low levels.<sup>22</sup>

In the last ten years there have been 7 cases of *Neisseria meningitidis* in the WDGPH area, the last confirmed case being reported in 2018. Of these cases, four were caused by a strain that could have been prevented with the meningococcal vaccine that is

provided free of charge in Ontario as part of the grade 7 immunization program and is required for school attendance.

## Polio (Poliomyelitis)

There is no cure for polio, it can be serious, resulting in paralysis and death in some cases. Vaccination used to prevent polio has been a priority over the past few decades.

First documented as a disease in the 18<sup>th</sup> century, poliomyelitis, or polio, is a potentially serious disease caused by a virus of the genus *Enterovirus* that is transmitted very easily from person to person. When people are infected, the virus multiplies in the throat and gastrointestinal tract and is passed in the nasal fluid and stools for days or weeks, even in people who do not have symptoms.

By the 19<sup>th</sup> and 20<sup>th</sup> centuries, polio was occurring worldwide and causing numerous outbreaks and deaths in North America and Europe. For example, major outbreaks in the US in 1916 and 1952 killed over 2,000 and more than 3,000 people, respectively. In addition, many survivors of the disease had lifelong disabilities such as deformed limbs and difficulty breathing without assistance.<sup>25</sup> However, in the 1950s, the first vaccine against the virus, a killed or inactivated polio vaccine (IPV), was developed and tested. The licensing of this vaccine in 1955 occurred in the same decade as the development of a live but weakened oral polio vaccine (OPV). The inactivated vaccine IPV was used mainly in North America, including Canada from the 1950s, and the live attenuated vaccine OPV, which was easier to administer, was adopted in Eastern Europe and several developing countries.<sup>26</sup> However, while IPV was able to stop outbreaks, it did not prevent transmission of the virus, while OPV did both. In 1962, Canada introduced the OPV and continued to use it until switching back to IPV in the 1990s.<sup>26</sup>

The Global Polio Eradication Initiative was launched in 1988, resulting in the expansion of polio vaccination efforts to most countries around the world. As a result of these efforts, polio had been eliminated from the Americas by 1994, and today polio remains endemic in only 2 countries, Afghanistan, and Pakistan.<sup>25</sup>

Overall, the continuation of the efforts to eradicate the disease by vaccination into the 21<sup>st</sup> century resulted in the incidence of polio being reduced by over 99% worldwide over the past two decades. In Canada, the last case of poliovirus thought to have been acquired locally occurred in 1977, and the country was certified polio-free by the WHO in 1994.<sup>26</sup>

Unfortunately, while preventing the transmission of wild poliovirus, the use of the OPV in some countries carries the risk that the live virus used in the vaccine can create a ‘vaccine derived’ polio virus (VDPV), that can be spread between people. Cases of polio identified in countries previously certified as being polio-free have often been identified as this ‘vaccine derived’ polio virus (VDPV). Recent reports in the media describing the detection of poliovirus in wastewater in the United Kingdom and New York City, as well as a case of paralysis in a young, unvaccinated adult in NYC, all concern VDPV. This is seen as a risk to unvaccinated communities in North America and Europe. New York State recently declared a state of emergency to address the issue.<sup>27</sup>

The immunization schedule for Ontario recommends immunization of children against polio at 2, 4 and 6 months of age, and again at 4 years.<sup>28</sup> Two doses of inactivated polio vaccine (IPV) are reported to be 90% effective or more against paralytic polio and three doses 99% to 100% effective.<sup>30</sup> There is limited information on how long the vaccine-derived protection lasts; however, the evidence that exists does suggest that it lasts for several or even many years.<sup>30,31</sup>

### Strategies to increase routine childhood immunizations

Vaccination rates locally for many vaccines pre-pandemic were good but there was room for improvement to move closer to eradication for some diseases and to reduce the incidence of others. The pandemic put strain on many of the healthcare systems and one of the results were that publicly funded vaccination rates decreased. This is due to lack of access to primary care, provincial wide closures, and redirection of resources to managing the COVID-19 outbreak and COVID-19 vaccination campaign. Table 1 represents historical (pre-pandemic) WDGPH data on vaccine coverage for polio, meningitis and measles, and current data for comparison.

**Table 1**

School Year	Polio	Meningococcal Meningitis	Measles
2021-2022	90.9%	88.5%	83.3%
2020-2021	93.2%	83.6%	86.9%
2019-2020	94.8%	83.7%	90.1%

2018-2019	95.1%	81.0%	91.3%
2017-2018	95.0%	75.4%	91.8%

### **Immunization School Pupils Act (ISPA)**

ISPA requires all public health units to collect and assess student immunization records, within this process immunization notices are generated and mailed to all parents/guardians or students aged 16 or over identifying what vaccines are overdue. The parent/student are required to demonstrate proof of vaccination or a valid exemption to avoid being suspended from attending school.

In the 2021/22 school year approximately 12,000 students were overdue for vaccinations and notified compared with just over 6,000 in the 2019/20 school year. Only 600 immunization notices were sent in 2020/21, this small number was a result of pandemic related school closures and competing public health capacity needs. In winter of 2023, WDGPH will send out 12,000 immunization notices. In addition, high school students will receive a letter if they still need any dose in their HB and HPV vaccine series.

In October 2022 Public Health Ontario (PHO) prepared an evidence brief on strategies to increase routine childhood immunizations with the following broad recommended interventions; reminders/recalls; school-based clinics; community-based clinics; primary care administration of vaccines and co-administration with other vaccines.<sup>32</sup>

Below is a list of strategies that WDGPH has used and will use to boost immunization rates locally.

### **Reminders/Recalls**

Not required and new for WDGPH, in June 2022, WDGPH sent a second immunization notice to all 6489 high school parents/guardians and/or students who were still overdue for ISPA -related vaccination as well as the HB & HPV vaccination. This was also the first time that WDGPH engaged in a targeted outreach to advise people of the overdue status for HB & HPV vaccines. From January 2022 to September 2022 the overall rates indicating full vaccination for students born in or before 2009 have increased from 54.2% to 69% for HB, 47.9% to 64.7% for HPV and 88.6 to 91% for meningitis.

Different methods of reminders identified as effective include phone calls and texts. WDGPH recently used robocall reminders of school clinics for parents/guardians of grade 7 students. The use of SMS messaging has not yet been utilized and will be considered as a strategy in 2023.

## School-based intervention

In the 2020/21 school year there were no school clinics, these services were resumed in the 2021/22 school year in all elementary and high school locations. In addition, grade eight and high school students were offered in-school clinics to catch up on missed vaccines. In June 2022 WDGPH offered a second clinic at high schools where immunization rates were <60%, this will be offered again in 2023. From September 2021 until August 31, 2022, WDGPH provided 7,711 ISPA required immunizations to children under 18 years of age. WDGPH will continue to work with local school boards to offer these highly effective school immunization programs.

## Community-based interventions

Additional WDGPH clinics including after hours appointments in all three offices and remote satellite locations were opened in the 2021/22 school year and continue today.

Community-based clinics were held in remote satellite locations in 5 smaller communities and a small number of clinics were offered in our COVID-19 mass immunization clinic sites in Stone Road Mall in Guelph and the Alder arena in Orangeville. WDGPH partnered with the Guelph Community Health Centre to offer vaccinations to at-risk youth in a local shelter. WDGPH also provided catch-up immunization clinics within the Grove Youth Wellness Hubs, an organization that provides support for youth mental health and wellness across the WDGPH area. These community clinics will continue to be offered on an ongoing and as needed basis.

## Primary Care Interventions

Primary care offices continue to be a significant location for students to catch up on routine immunizations. All primary care offices were provided with vaccines as needed, some also offered school age specific catch-up campaigns. WDGPH provides physician advisories on a regular basis with information on changes to Ontario's Publicly funded immunization schedule and the extended eligibility as part of the catch-up strategy post-pandemic. WDGPH will continue to provide support to primary care partners with vaccines, education, and updated immunization information.



WDGPH is working with the internal electronic medical record (EMR) provider and local family health teams to develop a grassroots mechanism to share vaccination information electronically between WDG Public Health and client healthcare providers. This process, if successful, will assist primary care and public health in knowing the client's full record and meet the requirements of ISPA. This will significantly reduce the efforts of both primary care and public health in meeting client needs and ministry guidelines. More information will be shared in a future report.

## Exemptions

The number of active religious or conscientious belief exemptions on file at WDGPH is 1,321 and there were 62 new exemptions added in the 2021-22 school year.

## Discussion

This report has provided background and historical data on three of the *ISPA* designated diseases, measles, meningitis, and polio. All three of these diseases can be prevented through publicly funded immunization and all three pose significant risks to those that are under immunized or unimmunized. Locally, there is room for improvement in vaccination rates to increase the health of the WDG population. WDGPH will continue to reach out to parents and/or students who are overdue for immunizations and will assess all student immunization records under requirements of the *ISPA*. School and community-based immunization clinics will continue to be offered throughout all regions of WDGPH in close collaboration with primary care partners to provide all publicly funded immunizations to students.

Additionally, increased vaccination rates will improve the long-term health outcomes of the community and reduce the burden of disease on the healthcare system. Costs associated with providing vaccinations and monitoring vaccine preventable disease vaccination rates locally significantly outweigh the costs of managing the same disease in the community.

## Health Equity Implications

Equity deserving groups are often underserved and require a concentrated approach to increase access to healthcare services, including immunization.<sup>33</sup> WDGPH will continue to offer or support community-based immunization clinics for hard-to-reach persons (eg. youth shelters, Grove youth and wellness hubs, and rural communities). We will continue to offer in school immunization clinics in all parochial schools that service the Mennonite populations of WDGPH

## Conclusion

Vaccination programs save millions of lives globally each year.<sup>1</sup> WDGPH will continue to assess, maintain, and report the immunization records of the nine designated immunizations required to attend primary and secondary schools per the *ISPA*.

Vaccinations will continue to be offered in a variety of settings to reach all students including those in hard-to-reach and equity deserving communities. This report has highlighted the three vaccine preventable diseases measles, meningitis, and polio, all of which can have very serious outcomes but for which effective and safe vaccines exist to prevent illness.

## Ontario Public Health Standards

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### Foundational Standards

- Population Health Assessment
- Health Equity
- Effective Public Health Practice
- Emergency Management

### Program Standards

- Chronic Disease Prevention and Well-Being
- Food Safety
- Healthy Environments
- Healthy Growth and Development
- Immunization
- Infectious and Communicable Diseases Prevention and Control
- Safe Water
- School Health
- Substance Use and Injury Prevention

## 2023 WDGPH Strategic Directions

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- People & Culture:** WDGPH has an organizational culture of engagement, inclusion and agility.
- Partner Relations:** WDGPH strategically collaborates with partners to address priority health issues in the community.
- Health System Change:** WDGPH is positioned to be an agent of change within the broader health sector.

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