Trends in Diseases of Public Health Significance in Wellington-Dufferin-Guelph

To:	Chair and Members of the Board of Health
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Recommendations

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

Key Points

- The Infectious Diseases program at Wellington-Dufferin-Guelph Public Health (WDGPH) receives reports of all laboratory-confirmed cases of diseases of public health significance (DoPHS) for residents of Wellington Couty, Dufferin County, and the City of Guelph.
- In 2023 noticeable increases in incidence were seen in six DoPHS: invasive Group A streptococcal disease, pertussis (whooping cough), viral meningitis, shigellosis, amebiasis, and listeriosis. The epidemiological trends for these diseases are described in this report.

Background

Under the Health Protection and Promotion Act (HPPA), infectious diseases are to be reported to the health unit for investigation on a 24/7 basis. O. Reg. 135/18: Designation of Diseases, under HHPA, identifies 71 Diseases of Public Health Significance (DoPHS), which vary in infectiousness and virulence. Management and control of infectious diseases are a program standard under the Ontario Public Health Standards with the overall goal of reducing the burden of DoPHs in the province.

Public Health systematically collects relevant information in infectious disease case investigation, such as symptoms, onset, potential acquisition and transmission, health status,

and risk factors. Analysis of these factors informs decisions and guides public health interventions and actions. Public health may recommend a variety of interventions depending on the infectious disease reported. Working with the WDG community and healthcare partners, public health interventions aim to prevent and reduce the spread of disease within these communities.

Appendix A summarizes the numbers and trends of laboratory-confirmed cases of DoPHs reported to WDGPH (excluding sexually transmitted infections) by year over the past five years (2019 to 2023, inclusive).

Discussion

Six diseases showed marked increases in 2023 in comparison with the number of cases occurring in 2022. These were, in descending order of frequency reported:

- Group A streptococcal disease
- Pertussis (whooping cough)
- Meningitis - viral
- Shigellosis
- Amebiasis
- Listeriosis

The five-year trends for these diseases are discussed below.

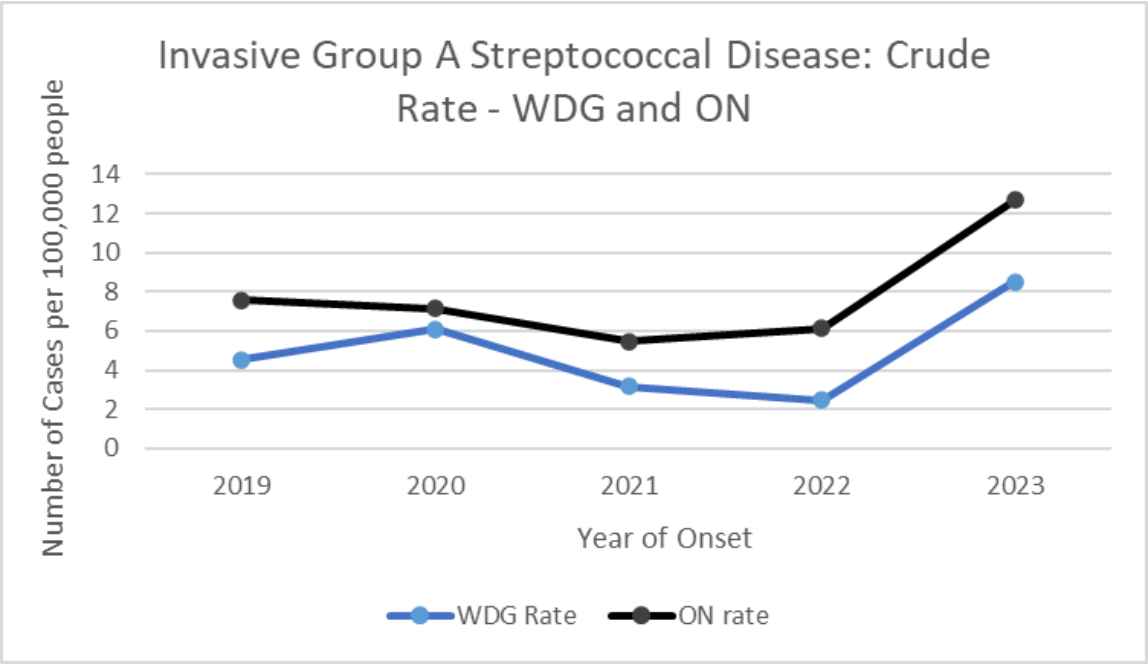
Invasive Group A Streptococcal Disease

Group A Streptococcus (GAS) is a bacterium that can be found in the nose, throat, and/or skin of healthy people but can make some people sick. It can spread person-to-person through contact with the fluids of the nose and throat or from touching infected wounds or sores. GAS infection commonly causes mild illnesses, such as skin infections and sore throats, but rare cases can become "*invasive*", meaning the bacteria can enter the blood or deep in the tissue; examples of this would be toxic shock syndrome and flesh-eating disease. Invasive GAS (iGAS) can result in life-threatening illnesses and even death.[1]

In most years over the five years in review, between ten and 20 cases of iGAS were reported to Public Health, with a five-year median of 14. However, a marked increase in reported cases was observed in 2023, with 28 cases occurring, compared to only 8 in 2022. The increased incidence reflects what has been seen in Ontario overall (Figure 1).

There has been an increasing trend in iGAS reported in some regions of the world for several years.[10] As of the end of 2022, that trend had not yet been seen in WDG. However, young children did contribute to the total case numbers of iGAS that occurred in 2023, with three cases in children aged less than ten years old in 2023 (an age-specific incidence of 8.3 per 100,000 children less than 10 years old), as compared to zero cases in this age group in 2022.

Figure 1:



Pertussis (Whooping Cough)

In Ontario, pertussis cases increase and circulate every 2-5 years.[2] Elevated pertussis activity was seen in WDG and several other Ontario health units in 2023. There were 23 lab-confirmed cases, representing a markedly increased incidence rate (more than 50 cases per 100,000 population, up from approximately 6 cases per 100,000 in 2022 – Figure 2).

Over 80% of the pertussis cases diagnosed in WDG in 2023 occurred in children under 10 years old (Figure 3). Outbreaks or clusters of pertussis cases can occur and are often most detectable in under-vaccinated children as the severity of symptoms results in an increased likelihood of a healthcare visit and laboratory testing. The vast majority (approximately 95%) of cases reported in 2023, where immunization status was available were either unvaccinated or only partly vaccinated at the time of illness. According to healthcare records, only one child had received the recommended number of doses of the pertussis vaccine, which has a reported efficacy of 85 to 90% in young children.[3]

Figure 2:

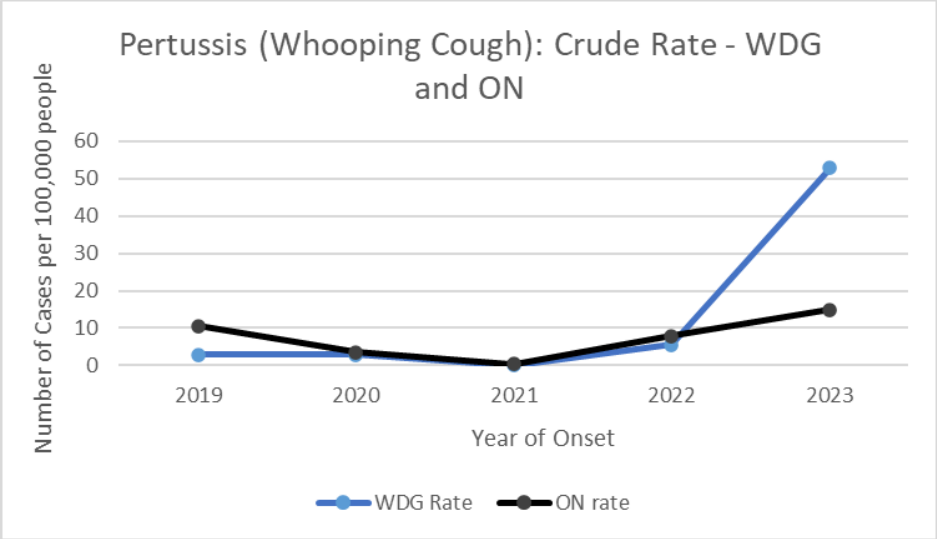
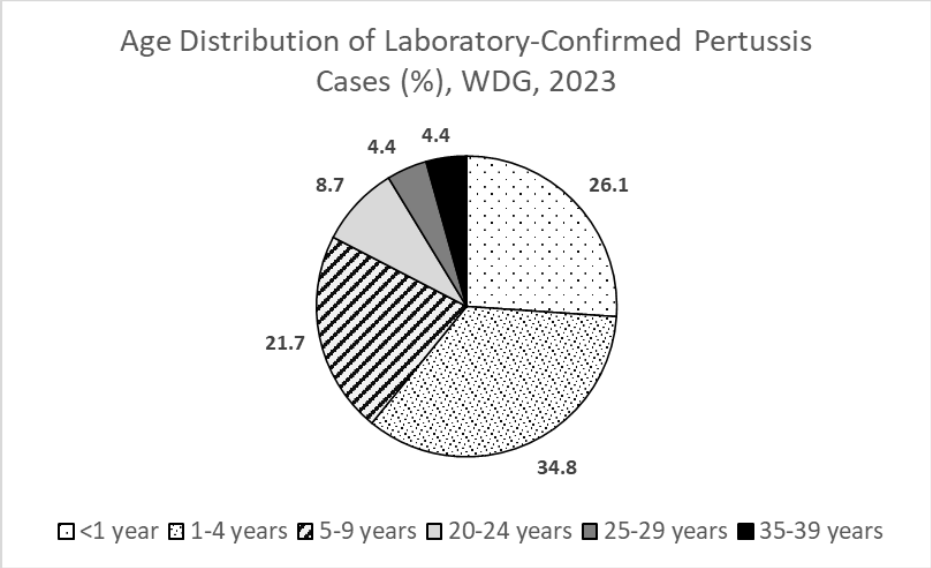


Figure 3:

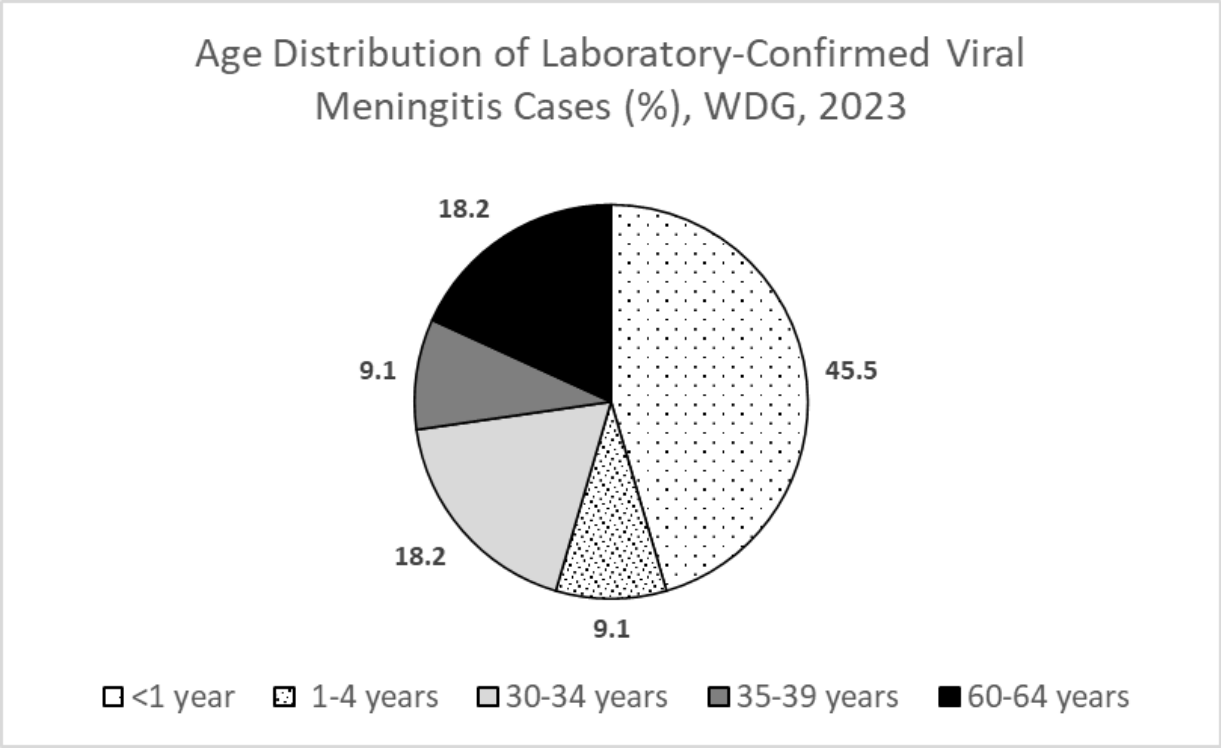


Viral Meningitis

Meningitis is a term used to describe the inflammation of the meninges: the membrane surrounding the brain. Several infectious agents can cause this inflammation, including viruses. The viruses most often associated with cases of viral meningitis diagnosed in North America are part of the family of enteroviruses, described as 'non-polio enteroviruses'.[4] Generally, these viruses cause only mild symptoms, and meningitis is a rare complication. The risk of developing viral meningitis is higher for those who are very young (e.g. newborn babies) or immunocompromised.

In most years, fewer than 5 laboratory-confirmed cases of viral meningitis are reported to WDGPH. However, 2023 saw a marked increase, with 11 cases reported – up from only one case in 2022. Over half of the 2023 cases were in children under 5 years of age (Figure 4).

Figure 4:



In all cases of this disease that occurred in 2023 in WDG in children under five years of age, an enterovirus was identified as the infectious agent. In several other cases and in all adults, the chickenpox virus (Varicella-zoster) was identified as the apparent cause.

The increase in viral meningitis seen in 2023 may reflect the increased transmission seen in many seasonal and other viruses last year as pandemic measures ended and increased contact occurred between people with the resumption of normal activities.[5]

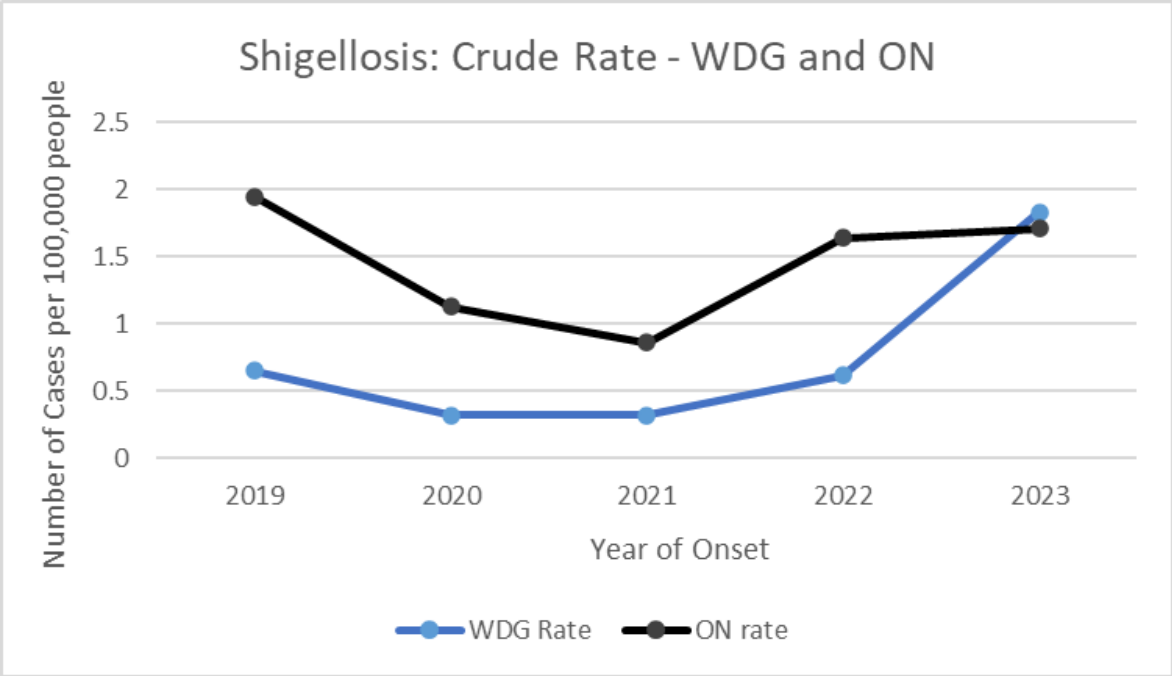
Disease-specific viral meningitis data are not available for Ontario, therefore local trends cannot be compared to provincial trends in this report.

Shigellosis

Shigellosis is caused by a bacterium (*Shigella spp.*), that is transmitted by touching contaminated surfaces or items and then touching your mouth, sexual oral/anal contact, or by swallowing contaminated food or water. Young children, travelers, men having sex with men (MSM), the under-housed, and individuals with weakened immune systems are most at risk of getting infected.[6] Fewer than five cases of shigellosis are usually reported per year in WDG; in 2022, for example, only two laboratory-confirmed cases were reported. However, 2023 saw a noticeable increase, with seven cases occurring in WDG. Most of the cases were adults, with an equal number of males and females. Over half of the cases had onset of symptoms during or shortly after travel outside of Canada.

No noticeable increase in shigellosis incidence was apparent in 2023 in Ontario overall (Figure 5); provincial incidence rates of this disease were approximately similar in 2022 and 2023, and in these years were slightly lower than the rate of reported cases in Ontario in 2019. However, the increased rate of cases in WDG in 2023 was only slightly higher than the 2023 provincial rate.

Figure 5:

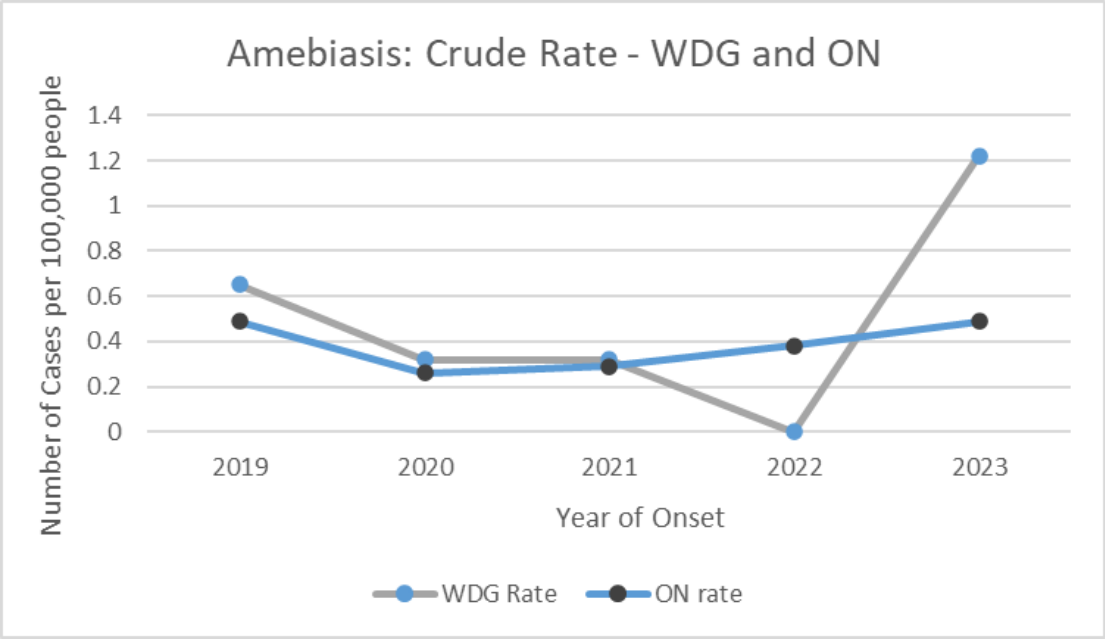


Amebiasis

Amebiasis is a gastrointestinal disease caused by the microscopic parasite *Entamoeba histolytica.* It is usually transmitted from human to human through indirect contact with the feces of an infected person, often through contaminated food or water. The disease is most common in tropical regions of the world with poor sanitary conditions. [7] In developed countries where the parasite is non-endemic, infections may occur in men who have sex with men (MSM) .[7, 11, 12] Few cases of laboratory-confirmed amebiasis are reported in WDG: between zero and 2 cases occurred each year from 2019 to 2022. The number of cases reported in 2023 rose to four, from zero cases in 2022. However, no definite increase in the incidence of amebiasis was apparent in Ontario over the last five years (Figure 6). As fewer than five cases occurred locally in 2023, assessment of trends for this disease may not be reliable; it remains to be seen whether the apparent increase will be sustained in 2024, which might indicate a true increase.

Of the laboratory-confirmed cases of amebiasis reported to WDGPH over the past five years for which case follow-up information was available, several were thought to have acquired the infection outside of Canada.

Figure 6:



Listeriosis

Listeriosis is a disease caused by the bacterium *Listeria monocytogenes* that is often serious, especially during pregnancy and in very young children, and immunocompromised individuals.[8]

Most people who become ill are infected by eating food contaminated by the bacteria. Some foods, such as soft cheeses, are considered more likely than others to be contaminated with *Listeria* than others; however, recently a wider variety of foods have been identified as sources of listeriosis outbreaks.

Very few cases of laboratory-confirmed listeriosis are usually reported in WDG, with a total of only three cases occurring locally from 2019 to 2021. No cases were reported in 2022. However, three cases occurred in 2023 - a noticeable increase from the previous few years. Because of the low numbers of cases reported annually and in 2023, this increase may not have been representative of a true increasing trend; no such change in incidence occurred in other health units or Ontario overall.

Several items of produce were recalled in Ontario in 2023 by the Canadian Food Inspection Agency because of the risk of contamination by *Listeria*; however, it could not be definitively determined whether any of the cases reported in WDG had consumed any of those foods.

Health Equity Implications

Health inequities and social determinants of health create conditions for the transmission of infectious diseases that can contribute to the unequal burden of illness in communities.[9] Poverty, isolation, limited education, and language barriers can create significant barriers to accessing healthcare.[9] Stigma and discrimination can further alienate groups from seeking out health care for diagnosis and treatment and disrupt public health efforts in the management of infectious diseases leading to poorer health outcomes for individuals and communities.

To address disparities, WDGPH provides information about infectious diseases in clear, simple language. Written materials can be translated into other languages to aid in understanding. Professional interpretation services are used when appropriate, to reduce communication barriers. Transportation can be provided, as needed, for those without the means to access services to ensure that access to care is not impeded.

Conclusion

A review of the data on DoPHS over the past five years indicated increases in 2023 of the diseases discussed in this report. These increases seen for some diseases, namely pertussis, viral meningitis, and invasive Group A streptococcal disease, may have been due, at least in part, to reduced exposure during the pandemic, and therefore reduced immunity of the population, especially young children, to several viruses that are endemic in Ontario.[5] The reasons for higher rates of other diseases, such as amebiasis and shigellosis, are currently unknown.

Ontario Public Health Standards

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

2024-2028 WDGPH Strategic Goals

More details about these strategic goals can be found in WDGPH's 2024-2028 Strategic Plan.

- ☒ Improve health outcomes
- ☒ Focus on children's health
- ☒ Build strong partnerships
- ☐ Innovate our programs and services
- ☐ Lead the way toward a sustainable Public Health system

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Appendices

Appendix A - Range and median of reported laboratory-confirmed cases of diseases of public health significance occurring in WDG annually from 2019 to 2023.

Note: Disease not reported (i.e. no cases) are not listed.(Meningococcal disease, Malaria)

Appendix A

Reported laboratory-confirmed cases of diseases of public health significance in WDG sorted in descending order from 2019 to 2023.

Disease	Number annual cases 2019-2023 (range)		Median cases (2019-2023)	2023 Increase over 2022
	Minimum	Maximum		
COVID-19	0	11,824	2,924	No
Influenza	1	296	210	No
Campylobacter enteritis	73	115	92	No
Hepatitis C	40	89	51	No
Crytosporidiosis	33	70	45	No
Salmonellosis	32	53	50	No
Giardiasis	28	42	33	No
Streptococcus pneumoniae, invasive	10	35	18	No
Group A streptococcal disease, invasive	8	28	14	**Yes**
Lyme disease	6	20	10	No
Verotoxin-producing *E. coli*	7	14	11	No
Legionellosis	6	12	10	No
Cyclosporiasis	2	14	10	No
Chickenpox	5	9	8	No
Pertussis (whooping cough)	0	23	3	**Yes**
Haemophilus influenzae, all types	2	9	7	No
Yersiniosis	1	9	4	No
Meningitis - viral	0	11	3	**Yes**
Hepatitis B	1	4	3	No
Carbapenamase-producing enterobacteriaceae	1	5	2	No
Shigellosis	1	7	2	**Yes**
Meningitis - bacterial	1	5	2	No
Hepatitis A	0	4	1	No
Amebiasis	0	4	1	**Yes**
Listeriosis	0	3	1	**Yes**
Monkeypox	0	6	0	No
Paratyphoid fever	0	2	1	No
Blastomycosis	0	2	1	No
Trichinosis	0	2	1	No
Creutzfeldt-Jakob disease	0	2	0	No
Q fever	0	1	0	No
Meningitis - (not viral or bacterial)	0	1	0	No
Botulism	0	1	0	No
Rubella - congenital	0	1	0	No
Typhoid	0	1	0	No