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Hazard Identification and Risk Assessment (HIRA)

Infectious Diseases at the FIFA World Cup 2026 Games in Toronto

Report

2nd Edition: May 2026

Public Health Ontario

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Introduction

Purpose

Public Health Ontario (PHO) conducted a second edition of the mass gathering (MG) HIRA, building upon the first edition from September 2025, to assess the potential likelihood and impact of infectious disease (ID) hazards while the City of Toronto hosts the Fédération Internationale de Football Association (FIFA) World Cup (FWC) 2026 games. As recommended in the first edition of this HIRA, updated epidemiological trends and enhanced monitoring of global public health signals have been used to re-assess the risk of ID hazards and further refine public health planning priorities, preparedness and response measures. Relevant audiences for this product include the local and provincial public health agencies, public health practitioners involved in planning or response activities, as well as other jurisdictional and international health authorities interested in MG risk assessments.

Risk Question

For the identified ID hazard group, what is the likelihood of the event of interest occurring during May 28, 2026, to August 2, 2026 (two weeks before and after the multi-site FWC tournament) and the impact to the public health capacity of Toronto and two neighbouring regions?

Scope

This assessment focused on ID hazards that may arise two weeks before, during, or two weeks after planned MGs as well as public health measures (PHMs) (i.e., non-pharmaceutical interventions to protect the health and well-being of communities)[1] and surveillance that can be implemented before and in response to potential ID hazards. Risk to public health capacity was assessed; environmental, non-ID and bioterrorism hazards were out of scope for this HIRA and were addressed through other risk assessment work.

At the time of finalizing this report (May 2026), a hantavirus outbreak linked to an international cruise ship was declared by the World Health Organization (WHO). Andes virus (ANDV), the hantavirus species identified in this outbreak, is found in South America and is not endemic in Canada. Both the WHO and the Public Health Agency of Canada (PHAC) have assessed the overall risk of acquiring ANDV for the general population in connection to the cruise ship outbreak as low and will continue to provide updated information on this international investigation.[2,3] In this HIRA, the risk of acquiring hantavirus infection during the FWC 2026 games was not assessed separately from other zoonotic diseases, only epidemiological data up to March 31, 2026 was included.

Key Findings

- Based on the updated assessment completed on March 31, 2026, the following IDs or ID categories are assessed as having a moderate risk level for the FWC 2026 games:
    - Measles
    - Food and waterborne diseases
    - Mpox
- Since the first edition of this assessment completed in September 2025:
    - Mpox is elevated from a low to a moderate risk level amid increasing reports of clade I importation and circulation outside of endemic areas and sustained global and local clade IIb transmission. International travel and social and sexual networking associated with FWC and the overlapping Toronto Pride period increase the likelihood of mpox importation and amplified transmission.
    - COVID-19 decreases from a moderate to low risk as increased activity is estimated to be unlikely given recent local and global epidemiological data, recent MG experiences and currently circulating variants.
- Food and waterborne illnesses and measles continue to be assessed as moderate risks. Food and waterborne illnesses are common at MGs and have contributed to past public health investigations at Toronto MGs. Elevated global measles activity in other host regions contributes to its ongoing moderate risk potential for FWC 2026.
- All other IDs remain at a low risk level considering outbreaks at past MGs, Ontario trends and existing preparedness, planning and response capacity. While other IDs were estimated as low risk, they still require planning and preparedness activities to mitigate potential exposures and impacts.
- As recommended in the first edition of this HIRA, public health planning should consider pre-, during and post-event targeted risk communications and educational messaging for visitors and local populations (e.g., respiratory etiquette, up-to-date vaccinations, hygiene practices), ensuring healthy environments (e.g., capacity for public health inspections and investigations) and promoting awareness of anticipated illnesses, risk factors, and infection control and prevention (IPAC) guidelines among hospitals and medical clinics.
- Additional planning considerations provided in this second edition include:
    - Post-event evaluation activities and information sharing.
    - Enhanced monitoring, health promotion, clinical awareness and capacity for IDs assessed as having a moderate risk level.

Background

The FWC 2026 tournament will take place from June 11 to July 19, 2026. It will be jointly hosted by 16 cities in three North American countries. The main host country is the United States of America (US; 11 host cities), while Canada (Toronto, Ontario, and Vancouver, British Columbia) and Mexico will be auxiliary hosts. The City of Toronto will host six matches in the tournament starting June 12, 2026, and the last match in Toronto will be on July 2, 2026.

Compared to previous FWCs, FWC 2026 will have an additional 16 national teams participating (total of 48 teams), featuring all regions of the world.[4] Toronto will host games between Canada, Ghana, Panama, Germany, Côte d'Ivoire, Croatia, Senegal, Bosnia-Herzegovina, and Iraq as well as a round of 32 match on July 2, 2026.[4] It is estimated that at least 300,000 people will visit Toronto for these matches,[5] and while people from host countries have been among the top ticket requestors during FIFA's ticket sales,[6] Toronto can anticipate welcoming visitors from around the world.

International MGs pose a risk for the spread of IDs among participants, attendees, and local populations, which may lead to onward global spread. Multiple factors contribute to the level of risk including, but not limited to, circulating diseases and demographics of visiting and host populations, environment and seasonality, the type of MG event, and behaviours and interactions between host and visiting populations.[7] The FWC 2026 is a high-profile event that will likely receive substantial international attention, contributing to expectations that the host cities ensure the health and safety of participants, visitors and organizers.

Host cities' public health preparedness, planning and response capacity also determine the level of risk an ID poses. This risk analysis aims to inform local and provincial planning and response to IDs related to the FWC 2026 games in Toronto. PHMs for ID hazards, along with the public health capacity of Toronto Public Health (TPH) and two neighbouring health units, Peel Region and York Region, were considered in the context of FWC 2026.

Methods

This project applied PHO's MG HIRA methodologies and templates. To identify potential ID hazards and public health preparedness activities related to planned MGs, a PHO librarian-generated search strategy was used to obtain peer-reviewed and grey literature published between April 1, 2024, and April 21, 2025, building upon the European Centre for Disease Prevention and Control (ECDC)'s 2024 review of MG and ID literature published between January 2014 to March 2024.[7] For this second edition of the report, an updated search of grey literature sources was conducted in March 2026 with a focus on ID-related events associated with sporting MGs including the 2026 Milano Cortina Olympic Winter Games (see the Literature Review section in the Technical Appendix for further details).[7] Additionally, event and indicator-based surveillance systems were monitored from September 2025 to March 2026. Updates to the initial risk estimates also considered more recent epidemiological data on infectious disease trends in Ontario and other assessments examining the risk of importation based on the nations of qualifying teams and expected visitors for the Toronto games.[8]

Evidence summaries were drafted to summarize information collected for the assessment and used as the basis for generating likelihood, impact, and overall risk estimates of the ID hazard event(s) of interest (see the Risk Estimation section in the Technical Appendix for definitions and further details). PHO subject matter experts (SMEs) validated evidence summaries, ID event(s) of interest, risk estimates and rationales.

Where appropriate, evidence summaries and risk estimates were considered at the level of ID hazard group: food and waterborne diseases, vector-borne and zoonotic diseases (VBZDs), sexually transmitted and blood borne infections (STBBIs), vaccine preventable diseases (VPDs), respiratory illnesses, antimicrobial resistant organisms (AROs) and other emerging diseases (e.g., A(H5N1)). Specific diseases or pathogens were considered individually where warranted (e.g., higher risk than overall ID hazard group or different event of interest). Where relevant, populations most vulnerable to ID exposures or impacts were described (e.g., demographics of visiting or host populations). To assess the risk for each ID hazard, the likelihood and impact were assessed and used with the risk matrix to assign one of three risk levels (high, moderate, low) for the following risk question: For the identified ID hazard group, what is the likelihood of the event of interest occurring during May 28, 2026 to August 2, 2026 (two weeks before and after the multi-site FWC tournament) and the impact to the public health capacity of Toronto and two neighbouring regions?

Assignment of risk level reflects evidence included up to March 31, 2026. For more information, please see Appendix A: Technical Notes.

Results

Summary of HIRA Findings

PHO's review of MG literature aligns with the findings from other reviews by ECDC and Santé publique France in preparation for the 2024 Paris Olympic and Paralympic Games (OPGs), and post-2024 summer OPGs summaries of public-health related events. Summer MG sporting events have historically been associated with sporadic cases or clusters of IDs, namely respiratory and gastrointestinal (GI) illnesses, but not any major outbreaks.[7,9,10] While some imported pathogens may circulate, the seasonality (summer) and outdoor venues are not typically conducive for sustained spread of IDs. Furthermore, international visitors are often coming from high income or resource settings, visitors' stays may be shorter than many pathogens' incubation periods, and cases reported at sporting MGs are typically common IDs for which public health systems are well prepared and have previous experience with.[9]

Table 1 provides an overview of ID hazards and the risk level estimate in response to the risk question. Summaries of the rationale, evidence, likelihood and impact estimates for these estimates can be found in the Summary of Rationale for Risk Estimates section. Specific diseases or pathogens were considered individually if they were anticipated to have a higher level of risk than the overall ID group, different events of interest than the overall ID group, or are diseases of international concern, for example. Overall ID hazard group risk estimates do not include disease-specific estimates within that group (e.g., the VPDs estimate does not include measles).

Table 1: Summary of Risk Estimates by ID Hazard Group

Disease	Risk Estimate
Vaccine-preventable Diseases (VPDs)	**Low**
Measles	**Moderate**
Food and Waterborne Diseases	**Moderate**
Vector-borne and Zoonotic Diseases (VBZDs)	**Low**
Respiratory Diseases	**Low**
COVID-19	**Low***
Influenza A & B	**Low**
Legionellosis	**Low**
Tuberculosis (TB)	**Low**

Disease	Risk Estimate
Sexually Transmitted and Blood Borne Infections (STBBIs)	**Low**
Mpox	**Moderate***
Antimicrobial Resistant Organisms (AROs) and Infections	**Low**
Other IDs: Viral Hemorrhagic Fevers (VHFs)	**Low**
Other IDs: Avian Influenza A(H5N1)	**Low**
Other IDs: Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV)	**Low**

*Overall risk estimate changed based on 2026 update. Previously, COVID-19 was moderate and Mpox was low.

Summary of Rationale for Risk Estimates

Rationales were based on evidence from the peer-reviewed and grey literature and PHO and external data (e.g., integrated Public Health Information System (iPHIS), PHAC and WHO). In addition, an internal SME review of synthesized information was conducted to validate likelihood, impact and risk estimates. The key references provided below do not represent an exhaustive list of all the evidence reviewed. Further details are available upon request.

Unless stated otherwise, the uncertainty associated with a risk estimate was low.

All events of interest are assessed for their likelihood and impact within the FWC risk period (May 28, 2026 to August 2, 2026). “FWC 2026-related” used in events of interest may refer to FWC exposure sites (official venues and off-site gatherings), cases or contacts among attending (visiting or local) populations. For events of interest referencing “expected levels of disease,” expected refers to the anticipated baseline level of disease in the City of Toronto historically observed during the FWC risk period. Every year Toronto hosts an influx of visitors/tourists and large events such as Pride, Major League Baseball games, concerts and street and food festivals. As such, increases in some illnesses are anticipated every summer along with greater numbers of visitors.

Vaccine-preventable Diseases (VPDs)

Examples: Mumps, Rubella, Pertussis, Diphtheria, Polio, Invasive Meningococcal Disease (IMD), Invasive Pneumococcal Disease (IPD), Varicella

Event(s) of interest: Increase in VPDs beyond expected levels, or FWC 2026-related clusters/outbreaks.

Risk Level: Low

Likelihood: Unlikely

VPD activity has increased globally due to decreased immunization rates and slower catch-up of routine vaccinations after the COVID-19 pandemic.[11] With the influx of international visitors for FWC, importation-related cases of select VPDs may occur in host PHUs (e.g., pertussis, varicella, IMD). IMD rates in Ontario have been increasing since 2022 and returned to pre-pandemic levels in the past year, in particular among adults aged 15 years and older.[12] Similarly, cases in the Region of the Americas and the European Region have been increasing since 2022 and recent outbreak activity in the UK highlight the opportunity for spread.[13–15] IMD cases have previously been acquired and exported from the Hajj, which occurs at the end of May 2026.[16] However, IMD is generally uncommon and rates remain lower than those observed prior to the introduction of vaccination programs in Ontario.[12,17] Historically, pertussis cases (2022–2025) for local PHUs and Ontario are highest in the summer months (July–September) while early summer is not peak season for many VPDs in Ontario.[18] VPD clusters and outbreaks have occasionally been reported at past MGs, typically among those who are unimmunized or under-immunized.[19–22] FWC 2026's outdoor setting and nature of the sporting event (i.e., transient contact between spectators rather than prolonged close contact) would be unfavourable for transmission.[9,18]

Impact: Moderate

Severe health outcomes are more often seen among the unvaccinated, children, elderly and individuals with weakened immune systems (i.e., not the anticipated main demographic of the FWC visiting population and spectators).[23–26] Although Toronto and neighbouring regions have relatively good vaccination coverage, they are generally below the national vaccination coverage goals.[27] Unimmunized or under-immunized persons and communities within these PHUs would be at greater risk of disease. A cluster or outbreak of IMD occurring within a group in close-contact settings (e.g., teammates) could result in a high workload for the affected PHU (e.g., case and contact management, post-exposure prophylaxis (PEP)). Cases or clusters of VPDs during FWC 2026 might receive media attention but are expected to be manageable within existing PHUs.

Measles

Event(s) of interest: One or more cases in FWC 2026 attending populations.

Risk Level: Moderate

Likelihood: Very likely

Amidst the global rise in measles activity, Toronto and neighbouring regions have seen an increase in international travel-related/imported cases since 2022.[28,29] In the Region of the Americas, there has also been a sharp increase in cases in 2025 and early 2026, compared to previous years, in particular in FWC 2026 hosting nations – Mexico and the US.[30,31] Global vaccine delivery and immunization catch-up has not yet returned to 2019 levels and FWC visitors may be arriving from countries with lower immunization coverage or ongoing outbreaks.[11,32]

Impact: Moderate

If cases linked to Toronto, neighbouring regions, or among unimmunized or under-immunized visiting populations were to occur, short-chains of transmission would be most likely given the relatively high local vaccination coverage (though still below the 95% target).[27] The multi-jurisdictional measles outbreak in Ontario (declared over on October 6, 2025, and which contributed to Canada losing its measles elimination status on November 10, 2025) predominantly affected unimmunized and under-immunized communities and had limited impact in Toronto and neighbouring regions.[28,33,34] However, even a single case would result in a high workload related to case and contact management (e.g., notification of individuals/organizations/public, the assessment of immunization status, isolation, and post-exposure prophylaxis).

Food and Waterborne Diseases

Examples: Food Poisoning/Gastrointestinal (GI) Illness, Norovirus, Salmonellosis, Verotoxin-producing *Escherichia coli* (VTEC), Hepatitis A, Shigellosis, Cryptosporidiosis

Event(s) of interest: Clusters/outbreaks of GI illnesses related to FWC 2026 exposures or among attending populations.

Risk Level: Moderate

Likelihood: Very Likely

An increase in GI illness is among the most reported events at MGs.[9,10,22,35–37] Locally, GI illnesses also increase during the summer months when FWC 2026 will be held.[18] Public health surveillance of the 2015 Toronto Pan/Parapan American Games led to 12 investigations related to GI illness or food/water safety violations.[38] Adherence to existing food and water safety testing and reporting protocols, guidelines, as well as enhanced event-based inspections should help mitigate most exposures.[39,40]

Impact: Moderate

Many food- and waterborne infections are self-limiting and resolve without medical intervention among an otherwise healthy population. Severe cases may require hospitalization and would be detected through existing surveillance mechanisms. PHUs are anticipated to manage most clusters or outbreaks, although any large outbreaks may require substantial epidemiological and food safety investigations to identify a source and could attract media attention particularly if a food vendor/restaurant is directly associated with the event (e.g., stadium or fan festival vendor). Exposure to a case of hepatitis A could potentially result in offering PEP to a large number of contacts (e.g., the case is a food handler at a FWC venue or event).

Vector-borne and Zoonotic Diseases (VBZDs)

Examples: Lyme disease (LD), West Nile Virus (WNV), Anaplasmosis

Event(s) of interest: Clusters of VBZDs related to FWC 2026 exposure sites or among attending populations.

Risk Level: Low

Likelihood: Very unlikely

Toronto and surrounding areas are established risk areas for vectors that carry tick- and mosquito-borne illnesses (LD and WNV) and sporadic human cases are commonly reported during the same time period as when the FWC 2026 will be held.[41] Autochthonous transmission of non-endemic VBDs is considered very unlikely due to the limited presence of competent local vector populations; however, sporadic imported cases may occur. Other reportable and endemic zoonotic diseases in Ontario (e.g., Q fever and rabies) are extremely rare or have a 5-year average year-to-date less than 10 cases.[42] Clusters of VBZDs are not commonly reported at MGs, even at past sporting events where host countries have had concurrent outbreaks (e.g., Zika – Brazil and Dengue – France).[7,9,43] Proactive, targeted vector-borne control is identified as the most important preventative measure to limit exposures.[44] The City of Toronto implements annual seasonal larviciding programs in urban areas,[45] and, official FWC 2026 sites are generally not suitable tick habitats.[46]

Impact: Minor

VBZDs require a competent vector or zoonotic reservoir for onward spread, are not transmitted person-to-person, and illnesses are for the most part self-limiting and do not require hospitalization. Early detection of some VBZDs (e.g., LD) is important to prevent severe disease.[47,48] National and international travel health advice generally includes guidance on preventative measures for insect bites, and early healthcare consultation if symptoms are present.[44]

There is moderate uncertainty with this estimate given the long incubation periods and potentially limited awareness of local vectors and symptoms among visiting populations, which means an increase of cases during the FWC 2026 may go undetected or fall outside the risk period.

Respiratory Diseases

Examples: Respiratory syncytial virus (RSV) and non-influenza/COVID-19 respiratory viruses

Event(s) of interest: Increase in respiratory illnesses beyond expected levels, or FWC 2026-related outbreaks.

Risk Level: Low

Likelihood*:* Likely

Increases in respiratory diseases are the most common infectious illnesses reported in relation to MGs.[7,9,35] Clusters and cases via syndromic surveillance have been noted at similar types of MGs. In Ontario, several non-influenza viruses have spring/summer surges (i.e., entero/rhinovirus, human metapneumovirus, parainfluenza and adenovirus) that may overlap with the FWC 2026 risk period.[49,50] Many of these viruses predominantly affect children and transmission is more likely in indoor crowded settings.[7] As official FWC 2026 venues are outdoors, spread is expected to be minimal.

Impact: Minor

Most respiratory illnesses are mild and resolve without medical intervention. Severe outcomes are more common at the extremes of age or in the presence of comorbidities.[35] Although this does not represent the predominant visiting demographic typically observed at FWC events, groups at higher risk of severe disease are part of the host population in Toronto.[23–25] Available public health interventions (e.g., public health messaging on proper hand hygiene and respiratory etiquette) can further minimize the population impact.

COVID-19

Event(s) of interest: Increase in COVID-19 (i.e., SARS-CoV-2) activity or severe outcomes beyond expected levels, or FWC 2026-related outbreaks.

Risk Level: Low

Likelihood: Unlikely

COVID-19 clusters and increased rates related to MGs have been reported, particularly during the pandemic.[7,35,43,51,52] The 2024 and 2026 OPGs reported limited COVID-19 cases among visiting athletic delegations, but no activity among visiting spectators or host populations that generated public health alerts.[37,43] COVID-19 seasonality is yet to be fully established; Ontario's historical surveillance suggests COVID-19 activity may increase during the time-period of interest (May 28-August 2, 2026), although percent positivity was below 10% during the same time period in 2025.[50] COVID-19 activity levels continued to decline globally in 2025, but other global regions may still be experiencing increased COVID-19 activity during the FWC 2026 period.[53] While open air venues help minimize transmission, short-range transmission is still possible in high density settings.[54]

Impact: Minor to Moderate

Impact depends on the circulating variant and whether the existing population's immunity mitigates the severity of disease outcomes. As of March 2026, there are no variants of concern circulating.[55,56] New variants tend to have increased transmissibility and/or immune evasion without necessarily being more virulent.[53] Since 2022, COVID-19 deaths and hospitalizations have lessened due to improved clinical management, control measures and population immunity.[53] Although vaccine booster uptake has been low, those most at risk of severe disease are more likely to have received a recent booster.[27,53,57] Further, public health and health care authorities are now experienced in managing COVID-19 and have existing capacities to cope with a potential increase in activity or severe health outcomes.

There is moderate uncertainty associated with this estimate since the MG literature reflects heightened surveillance and reporting of COVID-19 at MGs during and immediately following the pandemic. Globally, there has been a continuous decline in SARS-CoV-2 surveillance activities, testing and reporting of indicators such as burden of disease, vaccination coverage and sequencing information with a reporting bias towards high income countries.[53]

Influenza A and B

Event(s) of interest: Increase in influenza activity or severe outcomes beyond expected levels, or FWC-related outbreaks

Risk Level: Low

Likelihood: Unlikely

Some influenza outbreaks and restricted clusters have been reported at MGs,[7] particularly where overcrowded conditions or close living quarters have favoured onward spread.[21,35,58] However, influenza activity is generally low in Ontario and Canada during the FWC 2026 period.[49,50] Although visiting populations may arrive sick with seasonal influenza viruses where the local population is not immune,[59,60] the season and open-air venues at FWC 2026 are not conducive to sustained spread.

Impact: Minor to Moderate

Severe illness (e.g., requiring hospitalization) is more common among young children and elderly populations, while FWC attendees, including international visitors, have predominantly been adult males.[23–25] If a novel virus, or a virus to which the local population is not immune, is introduced this may cause more illness than is typically observed in the summer months. Cluster or outbreaks reported at open air MGs have typically been small (e.g., 2 to 30 cases per 100,000 attendees) and would be expected to be manageable by PHUs.[9,22]

Legionellosis

Event(s) of interest: Cluster of legionellosis related to FWC 2026 exposure sites or among attending populations.

Risk Level: Low

Likelihood: Unlikely

Legionellosis is a common health priority with indoor MG venues.[7,61] Fortunately, only one legionellosis outbreak was reported over 20 years ago that involved international visitors at a FWC tournament.[9] Although FWC 2026 official sites will be outdoor open-air venues, common legionellosis exposures (e.g., cooling towers) are not limited to specific venue sites and aerosolized contaminated water could present an exposure risk. In Ontario, most cases of legionellosis are sporadic and case counts annually peak between June to August.[62] While Ontario legionellosis rates increased between 2012 to 2021, they have remained stable over the last 5 years.[62]

Impact: Moderate

Legionellosis is a reportable disease, and severe cases (e.g., Legionnaire's disease) would be detected through existing surveillance. Legionellosis investigations can require intensive efforts to identify and test potential sources of contamination.[63] However, it is anticipated that PHUs would have sufficient control measures and resources to implement.

Tuberculosis (TB)

Event(s) of interest: Cluster of TB among FWC 2026 attending populations.

Risk*:* Low

Likelihood: Very Unlikely

TB has been considered a risk in MG settings where participating populations may be coming from high TB, TB-human immunodeficiency virus (HIV), or TB-multidrug resistant/rifampicin resistant burden countries (e.g., the Hajj in Kingdom of Saudi Arabia, or Kumbh Mela in India). Even in these settings, TB outbreaks or large transmission events have not been reported.[7,64,65] TB transmission typically requires prolonged close contact settings (i.e., dozens to hundreds of hours),[66] which is not anticipated within the FWC 2026 context.[67] Toronto is usually one of the PHUs with the highest rates of TB (9.7 per 100,000 population between Oct 1, 2024, to Sept 30, 2025)[68] in part due to a greater proportion of people immigrating from higher TB-burden countries. Overall, Canada's rate of TB disease is among the lowest in the world (6.1 new TB cases per 100,000 population in 2024) and disproportionately impacts Inuit, First Nations and persons born outside of Canada.[69]

Impact*:* Moderate

In Canada, most TB isolates continue to respond to first-line treatment.[69] However, early detection is challenging and TB's incubation period can be weeks to years. As such, if a case or cluster is confirmed among FWC 2026 attendees or participants, post-game surveillance would be needed to link further cases. As one of the PHUs with the highest TB rates, Toronto is experienced in managing TB cases/contacts.

Sexually Transmitted and Blood Borne Infections (STBBIs)

Examples: Chlamydia, Gonorrhea, Syphilis, HIV, Hepatitis B/C

Event(s) of interest: Increase in STBBIs beyond expected levels, or clusters/outbreaks among FWC attending populations.

Risk Level: Low

Likelihood: Likely

No large STBBI outbreaks were reported in the MG literature, although, STBBIs are commonly reported with sporting and music MGs.[22] These events often attract younger demographics who are disproportionately impacted by STBBIs in Canada and globally.[23–25] The visiting FWC 2026 population is likely to overlap with this demographic (approximately 30-50 years of age, predominantly male) and some evidence suggests increased substance use and risky sexual behaviours (e.g., having new, multiple or casual sexual partners and unprotected sex) may occur at sporting MGs.[7,22,23,70] Some literature suggests that MG sporting events may correlate with increased commercial sex work and an increase in STBBIs.[35]

Impact: Minor

Treatment and supportive care are available for most STBBIs, although, cases of antimicrobial and multi-drug-resistant strains are a concern (e.g., gonorrhea and *Shigella*).[71,72] STBBIs are likely to go under-diagnosed or underreported at MGs.[35] Any cases or clusters during FWC 2026 would be expected to be manageable for host PHUs and dedicated resources within the health system (i.e., sexual health clinics).

There is moderate uncertainty associated with this estimate. Some STBBIs have short incubation periods (e.g., gonorrhea), while others like chlamydia and syphilis have long incubation periods (e.g., a few weeks).[22] Given the length of FWC 2026, it would be possible to see increased STBBI transmission and cases. There is limited evidence on the FWC 2026 visiting populations and behavioural risk factors for acquiring infections.

Mpox

Event(s) of interest: Increase in mpox activity beyond expected levels.

Risk Level: Moderate

Likelihood: Likely

The Greater Toronto Area has the highest proportion of mpox cases in Ontario, predominantly among gay, bisexual, and other men who have sex with men (GBMSM) who report having a new, anonymous, and/or multiple sexual partners.[73] Ontario has ongoing local transmission of clade IIb mpox, with seasonal increases observed from May to September and peaks typically occurring in June to July, which overlaps with the FWC risk period and other local events like Toronto Pride in June.[18,73] Pride-related domestic and international travel is likely to be a key driver of mpox importation and local transmission amplification,[74] given the higher proportion of individuals from populations currently experiencing mpox, with spillover into broader sexual networks, including those associated with FWC travel. While sporting MGs are not typically associated with direct mpox transmission, the FWC may increase exposure risk indirectly through international travel, social mixing, and overlapping sexual networks. This domestic mpox activity occurs in the context of sustained global mpox activity, including multiple concurrent clade I and II outbreaks across several African countries, ongoing clade IIb transmission in many jurisdictions, and reports of localized clade Ib transmission clusters in parts of Europe and the US (regions expected to contribute a substantial proportion of international visitors during the FWC period).[6,75–77] Canada has reported a small number of travel-related clade Ib mpox cases, including the first detection in Ontario reported in Toronto in March 2026.[78,79] These global and regional epidemiologic patterns increase the likelihood of mpox importation into Toronto, potentially adding to existing clade IIb transmission networks.

Impact: Minor to Moderate

In Canada, most mpox infections have been mild and self-limiting, with the majority resolving with supportive care and without hospitalization, particularly among vaccinated individuals.[73,79] Since 2023, most mpox cases reported in Ontario have been unvaccinated or received only one dose of the vaccine.[73] Vaccines continue to be recommended and available for eligible populations.[73,78] While Ontario has

limited experience managing clade I mpox, current case and contact management guidance, infection prevention and control measures, and vaccine recommendations are consistent across clades. Detection of clade I cases may require more intensive case and contact management, including enhanced follow-up and prioritization by PHUs; however, PHUs are anticipated to be able to manage these activities using existing resources. An increase in clade IIb cases could also result in increased PHU workload, though this is expected to be manageable within current public health infrastructure. Current surveillance and reporting systems are anticipated to detect cases and signal undetected community transmission.

There is moderate uncertainty associated with this estimate. Evidence on mpox transmission dynamics and clinical outcomes in high resource settings is largely derived from experience with clade II. While illness severity has generally been mild, ongoing outbreaks in Africa and continued community transmission outside the Africa region present opportunities for viral evolution, and transmission patterns or risk factors for infection and severity may change over time. Additionally, increases in case counts, particularly involving clade I, could place incremental operational demands on public health units, even in the absence of increased clinical severity.

Antimicrobial Resistant Organisms (AROs) and Infections

Event(s) of interest: Increase in antimicrobial resistant (AMR) infections beyond expected levels, including among FWC 2026 attending populations or introduction into hospital settings.

Risk Level: Low

Likelihood: Very Unlikely

Most MG-related AROs or AMR infections have been documented at the Hajj event in the Kingdom of Saudi Arabia,[65] where overcrowding and sanitation can be a challenge and visiting populations are older compared to what might be expected with visiting FWC populations.[23–25] A history of hospitalization, particularly in low- and middle-income countries, as well as the US (where there has been exponential growth in colonization and infections of *Candida auris*), is a risk factor for AROs.[72,80,81] Additionally, Methicillin-resistant *Staphylococcus aureus* (MRSA) infections may be a particular concern for athletes.[82] However, clusters of AMR infections have not typically been reported in the MG literature.[7]

Impact: Moderate

Access to treatment may be difficult depending on the pathogen, type of infection (i.e., hospital or community-associated) and what treatment options have been authorized for use in Canada.[72] Adherence to ARO appropriate screening protocols in hospital and implementing appropriate IPAC would help limit onward spread. In Ontario hospitals, screening protocols and precautions are most common for MRSA and *Clostridioides difficile* but are inconsistent for other pathogens.[81]

Other IDs: Viral Hemorrhagic Fevers (VHFs)

Examples: Crimean-Congo Haemorrhagic Fever, Ebola Virus Disease, Marburg Virus Disease, Lassa Fever

Event(s) of interest: One (suspected or confirmed) case.

Risk Level: Low

Likelihood: Very unlikely

VHFs are not endemic to Ontario or Canada. Despite past and ongoing outbreaks globally, no cases have been reported in Canada since 2002 (i.e., when the disease group was re-listed as a nationally notifiable disease).[83] The PHO and ECDC literature reviewed did not report any VHF cases or clusters in association with MGs.[83]

Impact: Major

Even a suspected case requires immediate IPAC measures and public health investigation and would require national and international collaboration. There is existing guidance for IPAC and coordination of sector supports for suspected or confirmed VHF cases in acute care settings.[83–86] However, initial symptoms are often non-specific (e.g., fever, rash and muscle pain) and diagnosis can be challenging or delayed, especially if only one case is involved. Past imported cases to the US and Europe have resulted in limited onward transmission and have typically only been among HCWs providing direct patient care.[87,88]

Other IDs: Avian Influenza A(H5N1)

Event(s) of interest: First human influenza A(H5N1) case reported in Ontario.

Risk Level: Low

Likelihood: Very unlikely

Avian influenza A(H5) human infections are rare but primarily occur through close unprotected contact with infected animals or contaminated environments. Avian influenza viruses have not shown the ability for sustained human-to-human transmission.[89] The risk of acquiring an infection is considered low for the general population, but low to moderate for those with occupational exposures or frequent exposures to potential sources (e.g. backyard poultry).[90,91]

Impact: Moderate to Major

While the most recent H5N1 infections in the U.S. have caused mild symptoms (e.g., conjunctivitis, fever, and cough), severe outcomes remain possible.[90,92] Historically and in recent cases, children and immunocompromised individuals appear more vulnerable to serious illness.[90] Ontario and Canada have existing control measures (i.e., surveillance, laboratory capacity, IPAC guidelines) that can be mobilized.[93] A single case would result in high media interest and likely an FPT response to support lab investigation and international reporting.

There is moderate uncertainty associated with this estimate. Current understanding of mild human illness has been based on limited human case data and evolving epidemiological understanding of the disease.[90,92,94]

Other IDs: Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV)

Event(s) of interest: One (suspected or confirmed) case.

Risk: Low

Likelihood: Very Unlikely

MERS-CoV is often considered a risk for MGs in the Arabian Peninsula (e.g., the Hajj, Kingdom of Saudi Arabia), where the virus circulates and people may come into contact with the zoonotic vector (dromedary camels).[95] Human-to-human transmission is possible, but is less common and requires prolonged close contact more likely seen in healthcare or shared housing settings.[95] Over 90% of all MERS-CoV cases have been reported in the Arabian Peninsula.[96] Some cases have been reported in association with participation in Umrah, but there was no evidence of onward transmission.[60] MERS-CoV is considered to be very unlikely in the FWC 2026 context given sites are outdoors.[67,95]

Impact: Major

Most confirmed MERS-CoV cases have had severe respiratory illness and 37% of all reported cases have died.[95] Clusters and outbreaks have been reported in healthcare facilities treating a case where there has been inadequate or inappropriate IPAC measures.[96] A single case of MERS-CoV in a host PHU would be globally significant and require provincial and federal involvement to support testing and international reporting.

Planning Considerations

Planning considerations and recommendations outlined in the first edition of this HIRA (completed by September 2025) largely continue to be relevant. While many of these activities would have been initiated or completed by the time of this update's publication (May 2026), they have been retained to support transparency of planning assumptions and to inform preparedness for future mass gathering events (see Appendix C). Additional planning considerations based on the second edition's updated results are provided below.

Ongoing planning efforts should consider how operations and communications can adapt and re-prioritize resources in the event of concurrent (FWC and non-FWC related) public health emergencies within and outside Toronto, Peel and York regions during the FWC period. A limitation of this HIRA methodology is that the likelihood and impact were assessed for specific-IDs, but did not consider the risk of concurrent, even minor, public health emergencies on public health capacity in an already saturated public health system. Multiple local public health events are a more likely scenario experienced during MGs.[9]

It is also recommended that public health preparedness and response efforts related to FWC 2026 be evaluated post-event. Evaluations may include both qualitative and quantitative measures to assess the success of enhanced surveillance and reporting systems and the experiences of those involved in planning and response. The publication of evaluations and event summaries would add to the global evidence on MG-ID preparedness and response following the COVID-19 pandemic.

Considerations for Moderate Risks

In the current update, measles and mpox have been assessed as moderate risks, in part due to increased global activity and the possibility of importation through visiting populations. These should be among diseases prioritized for pre-event preparedness activities to identify what additional measures should be taken for enhanced outbreak detection, reporting, public health messaging, frontline HCW awareness and surge capacity.

Measles continues to be a moderate risk in part due to elevated activity in other FWC 2026 host countries and uncertainties around immunization status of visiting populations. PHO recommends that, if possible, FWC participants (e.g., athletes and staff) travelling to Canada should be encouraged to have copies of their immunization records available to ensure timely assessment of contacts of measles cases. Enhancing frontline HCW awareness and clinical suspicion for measles among FWC-related travellers is also recommended as it supports timely notification, diagnosis, appropriate specimen collection and IPAC measures. Lastly, it is important to ensure there is sufficient capacity and federal, provincial and territorial (FPT) coordination to support additional surveillance and outbreak activities in the event of an outbreak.

Food and waterborne diseases also continue to be rated as a moderate risk since they are very commonly reported at MG events and can increase locally in the summer. During the 2015 Toronto Pan/Parapan American Games, 12 of 18 public health investigations were for GI illnesses or food/water safety violations,[38] and should be anticipated for FWC 2026. PHO SMEs recommended creating additional capacity to support public health inspection activities of food vendors and facilities including water storage or tanks associated with food trucks (i.e., pre-event and during the event as relevant). To facilitate laboratory testing, consider the feasibility of providing stool testing kits with instructions on how to complete lab requisitions and submit specimens to HCWs at FWC medical tents. HCWs should also be aware of where they can send suspect cases of hepatitis A for serological testing.

Increased mpox activity, including ongoing and amplified clade IIb transmission and possible clade I importations, is likely to overlap with the FWC period as international and domestic travel increase during summer and Pride season. In this context, incorporating mpox into broader STBBI risk communication and preparedness efforts is warranted. General STBBI messaging should be strengthened in advance of the event and integrated into Pride- and FWC-related communications, with an emphasis on safer sexual practices, partner awareness, and awareness of local sexual health services. These efforts should be delivered through existing and trusted channels and supported by community engagement approaches that are inclusive and non-stigmatizing. Mpox-specific messaging should focus on initiation and completion of mpox vaccination for eligible populations, as well as symptom recognition and testing. Feasible approaches include digital and webpage-based communications in advance of Pride season and the FWC, and the creation of supportive environments at select high-traffic venues (e.g., on-site provision of condoms and other harm-reduction supplies). Awareness of mpox symptoms and appropriate testing should be reinforced among healthcare workers, particularly in emergency and primary care settings where initial presentations are most likely to occur. PHUs should consider readiness for increased surveillance, case and contact management, and inter-jurisdictional coordination during seasonal peaks.

Additional low risk disease group-specific considerations are available upon request.

Conclusions

This HIRA summarized evidence on IDs associated with MGs and their likelihood and impact in the FWC 2026 context. High densities of people and crowded accommodations and facilities can facilitate the spread of IDs at MGs, particularly respiratory and food and waterborne illnesses. Official FWC 2026 sites will be outdoor venues (i.e., Toronto Stadium, Fort York and The Bentway Fan Zone, and Centennial Park training facility). While outdoor venues can decrease the likelihood of sustained person-to-person or respiratory transmission, transmission is still possible, particularly where there is a high-density of people or where there are common sources of exposure, such as food vendors or contaminated water sources. Based on the MG literature and local, national and global epidemiological and contextual information, the risk of food and waterborne illnesses, measles and mpox are assessed to be moderate, while all other IDs were estimated to be low risk.

Although IDs reported at warm weather and predominantly outdoor sporting MG events have mostly been sporadic cases or restricted clusters, a comprehensive enhanced surveillance plan that can detect and manage all IDs hazards is still important. Prevention and preparedness strategies should be implemented at three stages: pre-event, during the event and post-event (e.g., post-event enhanced surveillance). Even for IDs assessed as low risk, activities across these stages will be important including health promotion activities, risk communication, planning for public health and health system surge capacity (especially if there may be concurrent MG events), and minimizing potential exposures through food safety inspections and vector control, for example. Overall, with increased visitors to Toronto, some level of increased illness is to be expected with FWC 2026. However, proactive, collaborative and comprehensive planning, surveillance and response activities should minimize the risk of large outbreaks and the public health burden.

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Appendix A: Technical Notes

Methods

Type of assessment

This project involved a HIRA, guided by PHO templates and methodologies for MGs. These were supplemented with resources from the WHO approach to MG HIRAs.[97] A HIRA is a strategic and evidence-based assessment of public health risks to help inform planning and prioritization of health emergency preparedness and disaster risk management activities and can include considerations and options for strengthening the necessary coping capacities and reducing the exposure and population vulnerability to hazards.

Scope of assessment

This assessment focused on IDs hazards that may arise before, during, or after planned MGs as well as PHMs implemented before and in response to potential ID hazards.

Risks were assessed for PHUs Toronto, Peel Region, and York Region.

The following overarching questions guided data collection, risk-informed evidence gathering, and risk estimation:

- **Hazard Identification Question:** What ID hazards are anticipated to require a response or contribute to negative health outcomes for the 2026 FWC in the current local, national, and global context?
- **Risk Question:** For identified ID hazard group, what is the likelihood of the event of interest occurring during May 28, 2026 to August 2, 2026 (two weeks before and after the multi-site FWC tournament) and the impact to the public health capacity of Toronto and two neighbouring regions?

Data Collection

Data from peer-reviewed and grey literature was used to identify ID hazards related to planned MGs. To assess the risk of these IDs, literature review results and epidemiological data were incorporated into evidence summaries and risk estimates that were reviewed and validated by PHO SMEs.

Where appropriate, evidence summaries and risk estimates were considered at the level of ID hazard group (e.g., food and waterborne illnesses; VBZDs; STBBIs; VPDs; respiratory illnesses; AROs; other emerging diseases (e.g., A(H5N1)). Specific diseases or pathogens were considered individually if, for example, its risk is anticipated to be higher than that of the overall disease group or requires a different event of interest than that of the group (e.g., single case detection compared to outbreak, or ongoing outbreak in local context). Where possible, populations most vulnerable to ID exposures or impacts were described (i.e. visiting, host, demographics, etc.).

Literature Review

The initial review built upon a rapid literature review conducted by the ECDC prior to the 2024 Paris Summer OPGs.[7] The ECDC's review summarized public health preparedness and communicable disease outbreaks related to organized MGs (e.g., sporting competitions, religious or cultural mass gathering events) from January 2014 to March 2024.[7] PHO librarians developed peer-reviewed and grey literature search strategies to identify relevant literature published between April 1, 2024, to April 21, 2025. The following questions were developed to guide the initial search:

1. What outbreaks or increases in transmission of any ID have been observed during, before and after organised MG events (linked to the planned MG event) since April 1, 2024?
2. What preparedness and response measures were implemented in countries (e.g., by public health authorities, ministries of health, and event organizing committees) before and in response to potential or actual outbreaks during planned MG events?

For the peer-reviewed literature, detailed search strategies were developed for Medline and supplementary databases. Grey-literature searches were developed to scan information from public health and multilateral health organization websites.

Results from the peer-reviewed literature scan were de-duplicated and entered into Covidence, an online systemic review tool. Two reviewers double screened 20% of results at both the title/abstract and full-text screening stages. Reviewers met to discuss and resolve any screening conflicts and ensure inclusion/exclusion criteria was being accurately applied (inclusion and exclusion criteria are available upon request).

For the included literature, data extraction templates were developed to review the literature and collect data on types of IDs/outbreaks, planned MGs, ID events of public health interest, and PHMs reported across the literature.

To build on the information collected for the initial HIRA, an updated search of grey-literature sources was conducted in March 2026 with a focus on infectious disease related events associated with sporting mass-gatherings including the 2026 Milano Cortina Olympic Winter Games.

Risk-Informed Evidence Gathering

IDs identified in the literature review were prioritised for inclusion in evidence summaries and risk assessment based on their relevance to the FWC 2026 context. Inclusion and exclusion considerations were informed by Diseases of Public Health Significance (DOPHS), past PHO MG HIRAs, WHO priority pathogens, global observations of IDs and MGs (i.e., from the literature review), and SME input (see Appendix B). For relevant pathogens/diseases, supporting information was gathered (e.g., PHO DOPHS cases and rates, national and global data, and hand-searched literature as needed) to enable the assessment of the likelihood, impact, and overall risk an ID hazard group poses to Toronto, Peel Region, and York Region for FWC 2026.

Where available or appropriate, likelihood and impact evidence within ID hazard groups was further sub-grouped into local or global geographies (e.g. Toronto, Peel Region, and York Region, Ontario, Canada, WHO regions or key global trends). During the risk assessment process, information on the FWC 2026 event itself (e.g., venue characteristics) and visiting and host populations (e.g., demographics and behaviour) continued to be gathered as it became available.

Evidence Synthesis

The PHO Emergency Planning, Response, and Recovery (EPRR) team prepared an evidence synthesis summary for each ID hazard group based on the risk-informed data gathering. The evidence summary was used to complete the Risk Analysis Worksheet, which includes the assessment, rationale, risk estimate and planning implications. During this stage, the EPRR drafting team also defined possible events of interest for each ID group that were assessed for likelihood, impact, and risk estimates.

Risk Estimation

The EPRR team synthesized evidence to complete the Risk Analysis Worksheet. The completed worksheet was discussed internally by the team to reach consensus on the assigned likelihood, impact, risk, and uncertainty levels.[98] The completed Risk Analysis Worksheet was then reviewed and validated by PHO SMEs before they reviewed the draft HIRA report.

Assigning Risk Levels

To arrive at a risk estimate for an ID hazard group, likelihood and impact estimates were generated and input to a risk matrix (Figure A1) to arrive at an overall risk value (Risk = Likelihood x Impact). Three risk levels (high, moderate, low) have been defined and adapted from PHO's previous HIRA work for the FWC 2026 context. Definitions and considerations to assign likelihood and impact levels have been adapted from past MG HIRAs. A level of uncertainty was also assigned to each overall risk estimate and drivers of uncertainty were noted (e.g., uncertainty due to unknown event context or limited evidence). Where appropriate, differential risks for specific pathogens or key populations were reported (i.e., driven by differing impact or likelihoods).

Figure A1: Risk Matrix

Impact / Likelihood	Minor Impact	Moderate Impact	Major Impact	Severe Impact
Very Likely	Low	Moderate	High	High
Likely	Low	Moderate	Moderate	High
Unlikely	Low	Low	Moderate	Moderate
Very Unlikely	Low	Low	Low	Moderate

Risk Levels and Descriptions

High: The health event poses a threat to public health capacity of Toronto, Peel Region, and York Region during FWC 2026, including the two weeks preceding and following the tournament. It is a high priority for planning.

Moderate: The health event could affect the public health capacity of Toronto, Peel Region, and York Region during FWC 2026, including the two weeks preceding and following the tournament. It is a medium priority for planning.

Low: The health event is unlikely to affect the public health capacity of Toronto, Peel Region, and York Region during FWC 2026, including the two weeks preceding and following the tournament. It is a low priority for planning

Likelihood Definitions and Considerations for Assessment

Very likely: This health event is very likely to occur (i.e. is expected to occur in most circumstances).

- Considerations:
    - Multiple incidents have occurred in the last five years in the Toronto, Peel Region, and/or York Region, or the health event has been regularly reported at similar MGs.
    - Health event has a very high prevalence, incidence, or increasing rates among visiting or host populations, and/or, globally.

Likely: The health event is likely to occur.

- Consideration: One or two similar incidents have either occurred in the Toronto, Peel Region, and/or York Region in the past five years, or the health event has been reported at similar MGs elsewhere.

Unlikely: The health event is unlikely to occur.

- Consideration: Similar incidents have only occurred in the Toronto, Peel Region, and/or York Region more than five years ago, or the health event has only been reported once or twice at similar MGs elsewhere.

Very unlikely: The health event is very unlikely to occur (i.e., only under exceptional circumstances)

- Consideration: It is possible for the health event to occur, but it either has not been reported yet or it has only happened extremely rarely at non-MG events.

Impact Definitions and Considerations for Assessment

Severe: The public health capacity of Toronto, Peel Region, and/or York Region would be overwhelmed by the health event, and/or some essential services (e.g., emergency services, transportation, and/or education/childcare settings) could be disrupted.

- Considerations:
    - High disease severity, high morbidity or mortality
    - Very high incidence of cases or number of severe disease clusters
    - High profile issue-impact
    - National and international media attention
    - Potential for public health to be overwhelmed beyond surge capacity in multiple jurisdictions
    - Existing surveillance and laboratory systems are not robust enough to manage and would not be timely, require significant provincial and/or federal support
    - Requires significant cross-jurisdictional or multi-level planning

Major: The public health capacity of Toronto, Peel Region, and/or York Region would be strained by the health event and/or some essential services may be disrupted.

- Considerations:
    - Moderate-severe morbidity, important mortality numbers; moderate-highly transmissible
    - High incidence of cases and/or unusual disease clusters
    - Beyond local surge plans; local lab and surveillance systems may not be timely and will require external support and/or enhanced surveillance planning
    - Requires incident management at provincial level, significant multi-jurisdictional cooperation and support
    - Local and national media interest; some international media interest
    - Requires cross-jurisdictional advanced planning and support

Moderate: The public health capacity of Toronto, Peel Region, and/or York Region would have the capacity to cope with the health event. Unlikely that essential services would be disrupted.

- Considerations:
    - Mild-moderate morbidity, limited to no mortality; low to moderate transmissibility
    - Higher incidence than expected or unusual disease clusters
    - Short-term capacity issues in public health but manageable within existing surge capabilities
    - Possibly requiring enhanced functioning in surveillance and laboratory services but manageable within existing resources and expertise
    - Local media interest
    - Possibility for notification and monitoring by province
    - Manageable within existing health unit and/or plans and agreements
    - Need for advanced planning possible but limited

Minor: The health event is well within the capacity of the Toronto, Peel Region, and/or York Region public health system to manage (e.g., no disruptions to essential services)

- Considerations:
    - Mild, self-limiting illness with no need for medical assistance; no to low transmissibility
    - Not exceeding expected incidence rates and/or not unexpected diseases
    - Routine function of public health, surveillance systems and laboratory sufficient to manage
    - Negligible impact; local or nil media coverage
    - No need for advanced planning beyond routine structures

Levels of Uncertainty and Factors to Assign a Level

High:

- Minimal, poor-quality evidence
- Conflicting views among experts
- No experience with similar incidents

Moderate:

- Adequate quality of evidence
- Consistent results published in the great literature
- Agreements by two (or more) experts – assumptions made by analogous incidents

Low:

- Good quality evidence
- Multiple reliable resources
- Expert opinion concurs
- Experience of previous similar incidents

Appendix B: ID Selection for HIRA

To identify IDs of interest included in evidence summaries that would contribute to risk estimates for the ID hazard groups, a preliminary list of IDs relevant to planned MGs was compiled by the EPRR team. Relevance to FWC 2026 in Toronto was determined using the following considerations:

1. DOPHS that have the potential for human-to-human transmission among FWC participants, visitors, and local populations (i.e. self-limiting diseases, diseases limited to neonates to children, or those typically imported without onward transmission were deprioritized)
2. Infectious pathogens and diseases identified for risk assessment by experts in past PHO risk assessment products (e.g., 2015 Toronto Pan/Parapan American Games)[99]
3. IDs identified as requiring increased surveillance for past organized MGs (e.g., OPGs)[7,61]
4. IDs that have caused outbreaks or increases in illness beyond expected levels at previous planned MGs[7,61]
5. IDs identified by the WHO as presenting the greatest risk to public health because of their epidemic potential and/or the absence or insufficiency of countermeasures[100]

The preliminary list was then further refined through SMEs' input.

The following list includes reasons for why an ID might not be included in evidence summaries that contribute to risk estimates:

1. Self-limiting diseases, diseases limited to neonates or children, or IDs that are typically imported with limited onward transmission
2. The disease is rare (i.e., either a handful of cases or diseases where one or two outbreaks have occurred within the last 50 to 100 years with no further indication that the pathogen is in circulation)[101]
3. The disease is geographically restricted to one country[101]
4. The disease has low pathogenicity in humans[101]
5. There is little or no scientific information available about the disease in the published literature, presumably due to any or all of the above conditions[101]

Appendix C: Planning Considerations from 1st Edition

This section lists planning considerations that were prepared in the first edition of this HIRA report in September 2025. As noted earlier, some of these activities have since been undertaken and are therefore less relevant to the second edition HIRA Planning Considerations section. However, they have been retained to support transparency of planning assumptions and to inform preparedness for future mass gathering events.

Where existing surveillance is robust, the recommendation is to build upon these systems and resources in preparation for a MG event. For example, the 2024 Paris OPGs largely relied on existing surveillance systems, but also leveraged seasonal surveillance systems (e.g., environmental – heatwave and vector-borne data) and extended wastewater surveillance to other priority pathogens.[61] Systems that were stood-up for the OPGs included non-specific or syndromic surveillance through emergency responder data and epidemic intelligence conducted by ECDC.[7,9]

For FWC 2026, some PHO SMEs noted enhanced surveillance could consider integration of iPHIS, Public Health Ontario Laboratory (PHOL) testing and test results with syndromic surveillance mechanisms such as medical encounters to FIFA-specific medical clinics, calls to Telehealth Ontario, or use of hospital visit triage information from acute care hospitals across Ontario. The potential role of enhanced surveillance, including syndromic surveillance, should be considered alongside evidence from previous MGs in Ontario. During the 2015 Toronto Pan/Parapan American Games, syndromic surveillance was not found to provide early or unique notification for events and events that were reported through syndromic surveillance could not be validated.[38] Rather, enhanced communication systems (e.g., Public Health Coordinator, surveillance teleconferences, and extended hours/on-call process) were the primary sources of early notification to surveillance partners for new investigations.[38] One narrative review also noted that public health surveillance systems may be swamped by the effort required to validate each syndromic surveillance signal.[9]

In the Toronto, Ontario, and Canadian contexts, there is generally robust surveillance across different ID hazards. PHO outlined several planning considerations for pre-event public health activities to enhance ID awareness, detection, and preparedness. The following are general planning considerations from PHO and, where relevant, supporting insights from the literature followed by a summary of more specific considerations for IDs categories identified as having a moderate risk level. Additional planning considerations for ID categories identified as low risk are available upon request.

Pre-event

The following are activities for provincial and local authorities involved in planning and response plans to consider conducting in advance of the FWC 2026 games:

- Conduct proactive surveillance and assessments of local and global epidemiological trends for VPDs, VBZDs, respiratory diseases, STBBIs, HPAI, and VHF IDs with a particular focus on FWC 2026 participating countries to provide situational awareness. Within the above-mentioned ID categories, consider the global measles situation, and epidemiological/genomic trends of COVID-19 for proactive surveillance and assessments closer to the FWC 2026 tournament dates.
- Discuss the utility and feasibility of expanded sentinel wastewater surveillance.
- Consider the benefits and limitations in using syndromic surveillance and that data sources or methods used require sufficient time for training and gathering baseline data and trends.
- Define clusters or event(s) of interest that will alert and warrant further public health investigation and consider whether these need to be more sensitive during the FWC 2026 risk period based on estimated risk, resources and feasibility.
- Develop communication mechanisms to report and respond to health alerts and/or outbreaks across PHUs and host cities.
- Ensure mechanisms to receive laboratory reports are robust and ready so that reports are processed efficiently and that systems have adequate surge capacity.
- Standardize surveillance reporting across the involved PHUs and deliver training to staff that will use these systems.[38] Consider how reporting of human health surveillance will be integrated with other environmental factors or signals even in the absence of human illness (e.g., food handling and water safety issues at venues).
- Plan communication campaigns to increase awareness of any recommendations for the public (e.g., maintaining up-to-date vaccinations, practicing hand hygiene and respiratory etiquette) and HCWs (particularly emergency departments, primary care, others) covering relevant guidance on ID diagnosis, treatment and/or reporting.
- Consider performing table-top/simulation exercises to validate response protocols particularly with potential major impact pathogens (e.g., measles, influenza A(H5N1) and VHFs).

During

The following are activities for provincial and local authorities involved in planning and response plans to consider conducting during the FWC 2026 games:

- Enhance awareness among HCWs of clinical suspicion for measles and off-season respiratory illness among individuals who have travelled to attend FWC 2026.
- Enhance communication mechanisms (e.g., a public health coordinator, surveillance teleconferences, and extended hours/on-call process) to ensure timely and efficient detection and notification of sporadic ID cases to surveillance partners.

- Continue to scan local, national and global public health signals that might warrant action or impact FWC 2026. Consider leveraging existing networks, such as the Global Public Health Intelligence Network (GPHIN) daily reporting and[49,50] use of event-based reporting systems such as the WHO's Epidemic Intelligence from Open Sources system (EIOS).

Post-event

The following are activities for provincial and local authorities involved in planning and response plans to consider conducting in the weeks following the FWC 2026 games:

- Continue post-event enhanced surveillance and reporting, as some IDs have longer incubation periods past the end of the FWC 2026.
- Continue communication campaigns to promote public health risks and awareness for visitors with extended stays and frontline HCWs.

Future Risk Assessment Considerations

The first edition HIRA was conducted over 10 months in advance of FWC 2026. The following were risk assessment activities recommended at that time:

- **Partner validation:** the current estimates have been reviewed and validated by PHO; additional input from local and provincial public health experts supporting FWC 2026 preparedness should be used to further validate and contextualize the findings and planning implications.
- **Re-evaluation of risk estimates:** identify time(s) prior to FWC 2026 when risk estimates will be re-evaluated based on updated information.
- **Identify triggers for assessment/re-evaluation:** in addition to a set time for re-evaluation, identify evidence-based triggers for re-assessment of risk estimates (e.g., changes in incidence, transmission, severity, geography, status of ongoing outbreaks, etc.) and the assessment of new hazards (e.g., new Public Health Emergencies of International Concern).
- **Assess risk of bioterrorism:** ID bioterrorism risks (e.g., anthrax and plague) were not considered in this HIRA. If not already addressed elsewhere, the likelihood and impact of ID bioterrorism agents and other chemical, biological, radiological, nuclear and explosive (CBRNE) hazards should be considered in future assessment activities, including the collaboration required between PHUs, laboratory services, municipal and FPT agencies.[102]
- **Continued FPT-PHU collaboration:** PHO will continue to support risk assessment activities in collaboration with local and provincial partners for FWC 2026, including liaising with SMEs and federal counterparts as required.

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