

Health System Hazard Identification and Risk Assessment for the Pan/ Parapan Am Games

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Conflict of Interest

- No conflict of interest to declare

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Outline

- HIRA:
 - Brief review: standard HIRA purpose & approach
 - HIRA Challenges from a health system perspective
 - HIRA Challenges from a mass gatherings perspective
- Pan/Parapan Am Games Health System Preparedness
 - Trying a new approach to HIRA
 - Experience and issues

Purpose of HIRA

- Ontario's emergency management programs take a risk-based approach; determine which hazards are most likely to result in an emergency
- Office of the Fire Marshal and Emergency Management states that a HIRA:
 - Helps emergency management professionals prepare for the worst and/or most likely risks
 - Allows for the creation of exercises, training programs, and plans based on the most likely scenarios
 - Saves time and resources by isolating hazards that cannot occur in the designated area
- Also helps move emergency management programs from being reactive to also being pro-active.

Standard HIRA

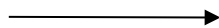
1) Identify Hazards: Ontario's provincial HIRA identifies the following categories of hazards:

- Natural Hazards: e.g. severe weather, forest fires, earthquakes & landslides, human health, disease & epidemics, and water-related such as drought & flooding
- Technological Hazards: e.g. building/structural collapse, Critical Infrastructure failure, energy supply, explosions/fires, Hazardous Materials (fixed site or in transport) nuclear facility emergencies, oil & natural gas emergencies, radiological emergencies and transportation emergencies
- Human-caused Hazards: e.g. civil disorder, sabotage, special events, terrorism, war and international emergencies

HIRA Process

2) Hazards are then scored on probability and consequence:

• Example



Probability				
4: Extreme	4		6 <i>Spring flooding in the north</i>	9
3: High	3			
2: Moderate	2		4	6
1: Low	1		2	3 <i>Nuclear facility emergency</i>
	1: No impact	2: Limited	3: Substantial	3: High
	Consequence			

Probability

Probability Rating	Description	Details
1	Low	Possible considerations include time of year, geography, presence of factors in a community (e.g. chemical plant, venue) experience in immediate past, experience in previous events, pressures in local context
2	Moderate	
3	High	
4	Extreme	

Consequence

Consequence Rating	Description	Details
1	No impact	(i.e., no or limited injuries/illness, deaths in community, no impact to health human resources, no economic disruptions or infrastructure damage)
2	Limited	(i.e., minor injuries/illness/deaths, minor health human resources disruption, economic disruption and infrastructure damage)
3	Substantial	(i.e., significant injuries/illness, significant health human resources, economic disruption and infrastructure damage)
4	High	(i.e., high probability of death, extensive health human resources impact, infrastructure damage and economic impact)

HIRA for the Health System: Challenges

1. Health risk assessment must consider MOHLTC's two mandated emergency management responsibilities:

- **“Health Services During an Emergency”**, i.e. the ability of the health system to continue delivering critical services during the games – capacity, capability, and continuity of operations (COOP)
- **“Human Health, Disease and Epidemics”**

Health Services During an Emergency – HIRA Challenges

- Standard HIRA breakdown of hazards can be of limited help for the health system in targeting health system planning efforts & resources:
 - Useful at community level to know local hazards
 - However, many individual hazards – e.g. storm, landslide, flood - create similar impacts on the health system:
 - Notification & communication
 - More patients and corresponding need for services & resources
 - Direct impacts on facilities/providers and their ability to continue providing services

Health, disease and epidemics - HIRA

Challenges

- Where health-specific challenges exist, high-level provincial HIRA doesn't capture specific challenges:
 - 'Pandemic' or 'Epidemic' given as examples in provincial HIRA
 - Doesn't capture range of severities or challenges that can be posed – e.g.
 - A routine illness that can be prevented/treated but requires a lot of resources/care?
 - Illnesses challenging to identify - emerging, rare, imported?
 - Illnesses challenging to treat – severity, absence of effective interventions, resistance to uptake of intervention, scarcity of specific treatment resources?
 - An illness with serious issues for a specific population?
 - Environmental risks to health arise in many and various circumstances – air quality, results of other emergencies

HIRA Mass Gathering Challenges

- Focus:
 - Risks to the gathering itself?
 - Risks to human health and/or the hosting area caused by the gathering?
 - A combination of the two?
- Scope:
 - Not starting from scratch:
 - An event may create some new hazards, but is also interacting with existing hazards in a community

2015 Pan/Parapan Am Games Approach

- MOHLTC Emergency Management Branch task: supporting existing health system preparedness for the Games
- Worked with Advance Planning Group to carry out health system HIRA
- Developed a new approach to attempting a health system HIRA in a mass gathering context
- First time using this approach

Approach

- Reviewed Office of the Fire Marshal and Emergency Management (OFMEM) and the Games Integrated Security Unit (ISU) HIRAs (focus: hazards to the Games)
- Grouped hazards into general categories group assessed as likely to have similar health impacts
- At this point, divided into two parallel approaches:
 1. Infectious/communicable diseases: would benefit from its own HIRA process looking at likelihood and consequence of specific diseases
 2. An 'extended health consequence analysis': looking at specific kinds of health system impacts, and attempting a scoring process based on likelihood of specific system impacts and planning consequences

Consequence Analysis: Categories of General Hazard

- Infectious diseases
- Heat
- Severe Weather
- Other Natural Hazards excluding severe weather
- Public Safety
- Traffic Disruptions
- Critical Infrastructure/ Technology Failure
- Other external pressures
- Communications Breakdown
- Labour Disruptions in the health system

Common Areas of Consequence:

- Lens: what is the impact of the games on our already existing health landscape? What changes?
 - Increases in demand for capacity - Surge
 - Increases in demand for/changes in access to specific capability - i.e. are there special skill-sets/expertise/levels of care needed, can they still be accessed, and are they in the right place?
 - Changes to HHR availability – ability and willingness of staff to report to work
 - New or different impacts on Facilities/Infrastructure/Systems - COOP considerations
 - Delayed access – i.e. movement of people, services, goods
 - Changed or increased environmental health considerations – e.g. contamination

	Heat Wave	Severe Weather	Other natural hazards	Public safety issues	Traffic disruption	CI / technology emergency or failure	Other external pressures	Communication & notification breakdown	Labour disruption
Changes in demand for Capacity/Surge									
Changes to or increases in demand for / access to specific capability									
Changes to HHR availability									
New or different impacts on facilities/infrastructure or key critical infrastructure supports like power									
New delays to access									
Changed or increased environmental health concerns									

Extended Consequence Analysis: Scoring

Probability:	<i>Likelihood that the specific impact on the health system of the hazard would increase due to the presence of the Games</i>
1	An increased impact to the health system is possible but unlikely
2	An increased impact to the health system is possible
3	An increased impact to the health system is likely
4	An increased impact to the health system is very likely

Consequence:	<i>Planning implications for the health system</i>
1	Manageable within existing plans/resources
2	Review and minor adaptations to existing plans/resources are necessary and useful
3	Significant additional planning within an existing area/region is necessary and useful
4	Significant additional planning across LHINs/PHUs/Services is necessary and useful

Example: Possible Impacts on Health System from heat wave

- Changes in Capacity/Surge needs, potentially including:
 - E.g. Exposure of athletes and groups of spectators at Games events to heat can create additional demands
 - General increase in demand in several parts of the system due to pressures on population (e.g. heat wave = impact on acute care, public health, community care) can impact ability to provide capacity to respond to Games-specific demands
- Changes in demand for/access to capabilities:
 - E.g. need for rehydration capacity at events
- Changes in HHR availability, potentially including:
 - Impact on safety of workplace – e.g. heat impact on outdoor EMS workers at venues
- New or different facility/systems impact & COOP considerations:
 - Interaction with Games demands on key critical infrastructure supports such as power
 - An existing vulnerability in the system – facility ability to deal with temperatures and disruptions

Example: Possible Impacts on Health System from heat wave

- Delayed access - disruption of:
 - Travel of people to services
 - Travel of services to people
 - Travel of goods to services
- Changed or increased environmental health considerations –
- E.g. water quality issues created by heat interacting with Games use of water facilities

“Human Health, Disease and Epidemics”

HIRA Tool

2015 Pan Am Games Risk Assessment Matrix Input: Communicable Diseases				
PROBABILITY/LIKELIHOOD			IMPACT/CONSEQUENCE	
Probability Rating	Description	Details	Consequence Rating	Description / Details / Impact
1	Low	Possible but not likely	1	No impact (none) <ul style="list-style-type: none"> 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 health system, surveillance systems and laboratory sufficient to manage Negligible economic impact; local or nil media coverage No need for advanced planning beyond routine structures
2	Moderate	Possible	2	Limited impact (Minor) <ul style="list-style-type: none"> Mild-moderate morbidity, limited to no mortality; low to moderate transmissibility Higher incidence than expected or unusual disease clusters Short-term capacity issues in health system 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; limited economic impact Possibility for notification and monitoring by province Manageable within existing health unit and/or LHIN plans and agreements Need for advanced planning possible but limited
3	High	Likely	3	Substantial impact (Moderate) <ul style="list-style-type: none"> Moderate-severe morbidity, important mortality numbers; moderate-highly transmissible High incidence of cases and/or unusual disease clusters Beyond local surge plans; local 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 Potential for economic impact and issue impact Requires cross-jurisdictional advanced planning and support
4	Extreme	Very Likely	4	High impact (Severe) <ul style="list-style-type: none"> High disease severity, high morbidity or mortality Very high incidence of cases or number of severe disease clusters High profile issue-impact, significant economic impact National and international media attention Potential for health system 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

Enhanced Risk Implications : Games Context

Contextual Factor	Relevant themes
Crowding	Close quarter accommodations
	Hygiene considerations (hand and/or cough)
Sporting events	Close contact (ie. wrestling)
	Recreational water (open water)
Seasonality	Throughout Games
Importation of diseases	Tropical diseases or increased prevalence in visiting countries
	Novel strains of Ontario endemic diseases
	Multidrug-resistant strains

Contextual Factor	Relevant themes
Exportation of diseases	Higher prevalence in Ontario
	Multidrug-resistant strains from Ontario
Mixing of visiting and resident populations during Games ^o	Droplet transmission context
	Contact transmission context
Long incubation period [~]	

Specific Examples

Disease	Risk Level	Rationale
Meningococcus	Higher Risk	<ul style="list-style-type: none"> • Significant morbidity and mortality • National or int'l media interest • Endemic globally • Reportable • Invasive meningococcal disease is a feared disease among the public • Crowding can amplify (close contacts) • Possibility of importation of non-vaccine preventable and/or new strains • Infectious before symptomatic

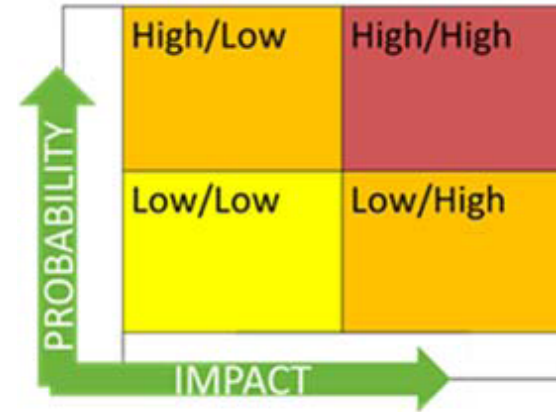
Specific Examples

Disease Sample	Risk Level	Rationale
Chlamydia/ Gonorrhea	Higher Risk	<ul style="list-style-type: none"> • Mild but requires treatment • Athletes, visitors, spectators as well as HCW need to know where clinics are • Potential for export of antibiotic-resistant strains • Anticipate extra visits to clinics – surge capacity for staffing and supplies • Ensure condoms are readily available • Media attention if an outbreak related to Games

Challenges

- Numerical scoring approach
 - May work well with hazards that have a degree of predictability/ established history
 - Experience: difficulties working with experts in assigning numerical scores – an heuristic, not an algorithm
 - May create perception of rigour or hard evidence-base that is not accurate
 - Can be challenging re: focus question:
 - E.g. Dermatological outbreak in a wrestling team: high impact to an event, but low impact to overall human health/health system perspective – how to score?
 - Planning consequence: attempting a provincial perspective on issues that vary among communities
 - Multiple or a range of planning scores often recommended

Summary



- “Traditional” HIRA process not ideal for health planning, but can be adapted
- Definitions of probability and impact need to be established and communicated
- Don’t get too complicated: numbers not as important as priorities for planning scenarios
 - Workload created by very detailed/systematic approach may be prohibitive and not resource-effective
- May need separate processes for in-games and community
 - Hazards whose likelihood is directly caused or increased by the event specifically, vs. interaction with existing hazards

Thanks!

