

# Public Health Hazard Identification and Risk Assessment



## The Chatham-Kent Experience

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# Objectives

- To review the requirements outlined in the new Public Health Emergency Preparedness Protocol, specific to identifying and assessing the relevant hazards and risks to public health
- To review the process used by Chatham-Kent Public Health in conducting a hazard identification risk analysis
- To highlight a best practice model, subsequent lessons learned and next steps



# Public Health Emergency Preparedness *Protocol*

## Operational Roles and Responsibilities *Assessment and Surveillance*

### 1) **Identify and assess the relevant hazards and risks to public health**

- a) The board of health shall identify and assess relevant hazards and risks to public health by:
  - i) Identifying the hazards relevant to public health within the health unit that may give rise to a public health emergency and/or emergency with public health impacts.

ii) Assessing the risk of identified hazards using qualitative and/or quantitative measures of probability and consequence which, at a minimum, capture information through a risk-assessment methodology.

iii) Ranking and recording the assessed risks to public health based on qualitative and/or quantitative measures of probability and consequence. Risks shall be prioritized from high to low based on the ranking of probability and consequence.

iv) Including hazard-identification and risk-assessment materials in a confidential appendix to the board of health emergency response plan. At a minimum the following shall be included:

- Process for hazard identification
- Methodology for risk assessment; and
- Results of hazard identification and risk assessment.

b) The board of health shall include as a high priority risk any hazard of provincial significance that is identified by the Chief Medical Officer of Health.

# **The Centre of Excellence in Emergency Preparedness -CEEP-**

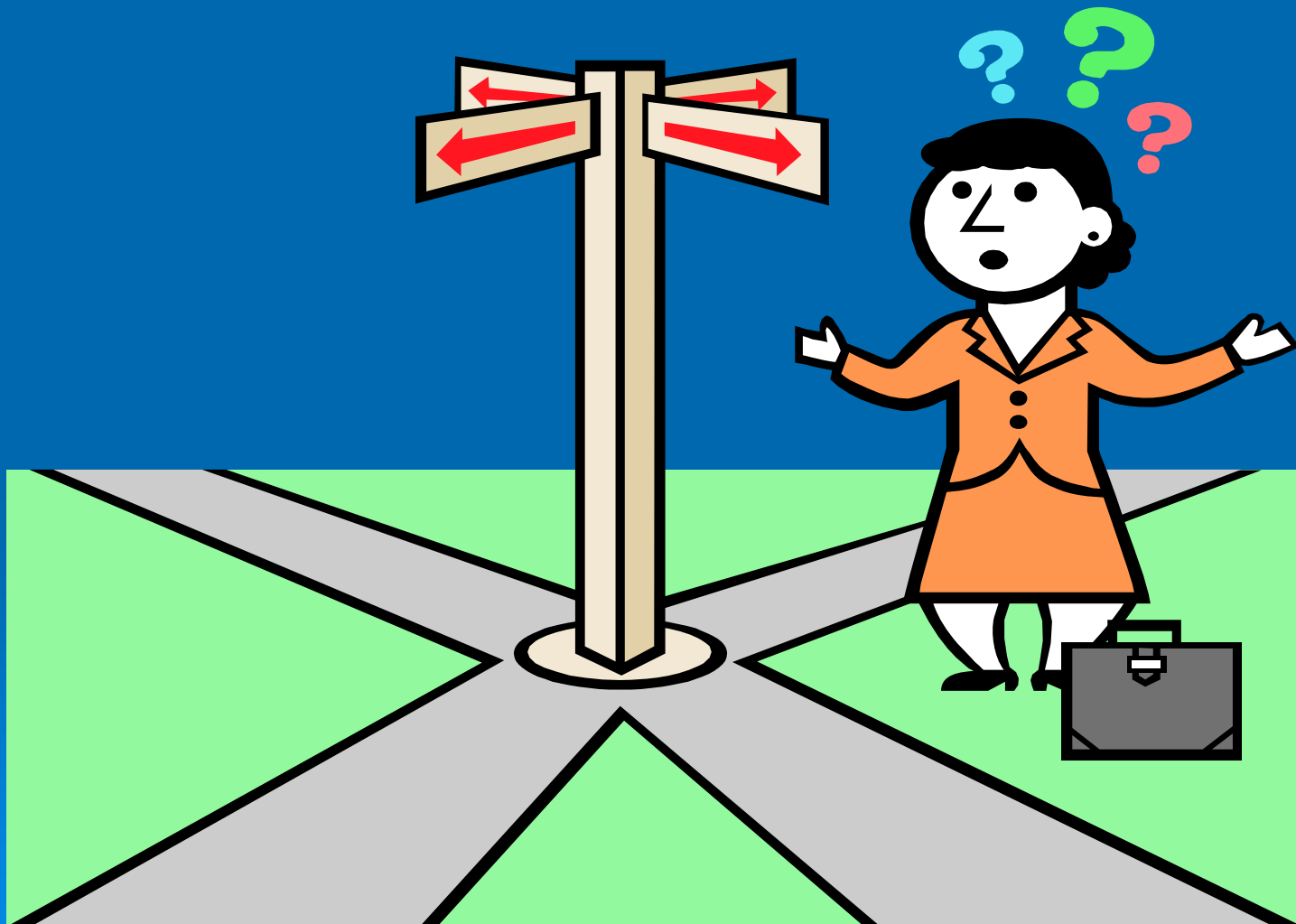
**Public Health Risk Assessment  
Public Health Risk Assessment Tool**

**Presented to PHUs in March 2007 by  
Bonnie Henry, MD, FRCPC, Doug Sider, MD, FRCPC**

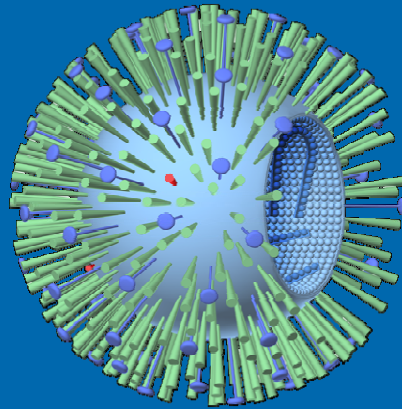
[www.ceep.ca](http://www.ceep.ca)



# Have you done your risk assessment?



# Risk = Probability x Impact



# Risk Categories

- **Naturally occurring events**

(Hurricane, Tornado, Ice storm, Epidemic/Pandemic)

- **Technological / Infrastructure events**

(HAZMAT Event, Fire, Water System or Transportation Emergency)

- **Human related events**

(Armed Conflict, Labour Disruption, Terrorism)



# Components of Risk

## Probability

- A. Highly likely
- B. Likely
- C. Possible
- D. Unlikely

## Impact

- 1. Marginal
- 2. Serious
- 3. Critical
- 4. Catastrophic

# Probability


Probability Rating	Description	Detail
<b>A</b>	Highly Likely	nearly 100% probability in next year
<b>B</b>	Likely	between 10 and 100% probability in next year, or at least one event in next 10 years
<b>C</b>	Possible	between 1 and 10% probability in next year, or at least one event in next 100 years
<b>D</b>	Unlikely	less than 1% probability in next 100 years

# Components of Impact


## Impact

1. Marginal
  2. Serious
  3. Critical
  4. Catastrophic
- *Human*
  - *Physical infrastructure*
  - *Business*

# Impact - Human

1. Unlikely to cause injury, illness or death in community members or providers
  2. Low probability of injury, illness or death
  3. High probability of injury or illness; low probability of death
  4. High probability of death
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# Impact – Physical Infrastructure

1. Unlikely to cause physical infrastructure damage causing service disruption with resultant costs/recovery challenges
  2. Minor physical infrastructure damage
  3. Moderate physical infrastructure damage
  4. Extensive physical infrastructure damage with substantial service disruptions, high costs and extended recovery time
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# Impact - Business

1. Unlikely to cause public/private sector service interruptions
2. Minor or limited or short term service interruptions
3. Significant/widespread or long term service interruptions
4. Numerous public/private sector entities unable to provide services

# Overall Impact Rating

<b>11-12</b>	<b>Catastrophic</b>	Community cannot assure core public/private services without extensive assistance from provincial or federal resources
<b>8-10</b>	<b>Critical</b>	Community can only assure a normal level of services with assistance from outside the region or the community is reduced to providing a minimal level of service with normal resources existing within the community
<b>5-7</b>	<b>Serious</b>	Community can assure a normal level of services with assistance from within region or reduced levels of service with resources existing within the community
<b>3-4</b>	<b>Marginal</b>	Normal level of functioning or increased level of public/private services required within the community

# Risk Assessment - examples

Threat	Probability	Impact (H+P+B)	Risk
Tornado	B	3+3+2	B8
Dirty Bomb	B/C/D	3+1+2	B/C/D6
Pandemic influenza	B	4+1+4	B9

# Risk Rating

Impact/Probability	<b>A</b> Highly Likely	<b>B</b> Likely	<b>C</b> Possible	<b>D</b> Unlikely
<b>11-12: Catastrophic</b>	<b>A11-A12</b>	<b>B11-B12</b>	C11-C12	D11-D12
<b>8 -10: Critical</b>	<b>A8-A10</b>	<b>B8-B10</b>	C8-C10	D8-D10
<b>5 - 7: Serious</b>	A5-A7	B5-B7	C5-C7	<b>D5-D7</b>
<b>3 - 4: Marginal</b>	A3-A4	B3-B4	<b>C3-C4</b>	<b>D3-D4</b>

**Moderate****High**

**Public Health Hazard Risk Analysis Tool**  
**April 2008**

Event	Probability	Human Impact	Property Impact	Business Impact	Overall Impact Rating	Risk Rating
	A,B,C or D (Table 1)	1,2,3 or 4	1,2,3 or 4	1,2,3 or 4	4-12 (Table 2)	(Table 3)
Transportation Emergency (e.g. plane, train, multi-vehicle crashes)	A	4	3	2	9	A9
Water System Emergency	A	4	1	4	9	A9
Electricity System Failures	B	2	2	4	8	B8
Flooding	B	1	4	3	8	B8
Tornado	B	2	3	3	8	B8
HAZMAT Events	B	4	3	3	10	B10
Air Quality Episode, e.g. severe prolonged smog episode	A	2	1	2	5	A5
Extreme Heat	A	3	1	1	5	A5
Severe Thunderstorm	A	2	2	2	6	A6
Blizzard	B	1	2	2	5	B5
Ice Storm	B	2	2	3	7	B7
Epidemic	B	3	1	3	7	B7
Pandemic	C	4	1	4	9	C9

# Comparison of Identified Priority Hazards and Risks by Sector in Chatham-Kent

## Public Health

- Transportation Emergency
- Water System Emergency
- Electricity System Failures
- Flooding
- Tornado
- HAZMAT Events

\*Pandemic

## Municipal

- Critical Infrastructure
- Failure of Water System
- Tornado
- Fog
- Major Structural Fires
- Arson
- Road Transportation
- Accident/Hazardous Mat.
- Hydro Outage
- Floods
- Nutrient Release
- Rail Transportation
- Accident
- Pandemic

## Hospital

- Epidemic/Pandemic
- \*Food Emergency
- \*Fog
- \*Snowstorm/Blizzard
- \*Water Quality
- Emergency
- \*Windstorm
- \*Energy Supply
- Emergency
- \*Infrastructure Failure
- \*Ice/Sleet Storm

# Key Findings and Lessons Learned

1. Break down silos between health and other agencies-- Meet with key stakeholders (municipal CEMC, first responders, hospital emergency planners) during the process and at least twice yearly to amend risk analysis and subsequent plans.
2. Verify the data by a process of stakeholder validation.
3. Expand on information recorded as a single word or a brief sentence to that of a full sentence or paragraph format. i.e. define water system emergency, transportation emergency.
4. Expand the Probability (A-D) and Impact ratings (1-4) from a single letter or number to a detailed reason or explanation of why the letter or number was arrived at.

## 5. Consider the following when compiling data:

**Capability** (a subjective rating of the health unit's ability to respond to the event); or identify if an external partner has the lead role

**Stakeholders** (Internal, e.g. health unit departments and municipal agencies, and External such as industry, hospitals, utilities, etc.);

**Population Affected**, shown either as a number or as a percentage of the total population, with identification of demographic, geographic, and any other particular concerns;

**Environmental Impact** (ground, water, and air) and how it could be controlled or eliminated;

**Critical Infrastructure at Risk**, incorporating Hard (assets) and Soft (programs) Services and how they are to be protected; and

**Existing Plans** that any department, ministry, industry, or other organization might have to deal with the event.

6. Identify trigger event (weather report, municipal/provincial advisory, loss of services).
7. Identify contingency reserve; Cost and schedule adjustments to project plans.
8. Allocate base funding for on-going annual training and exercises.
9. Identify Fall back or Alternate Plans (business continuity planning).
10. Involve the epidemiological team in the HIRA process.

# Additional Information to consider when completing HIRA

**Stakeholders:** Internal:  
External:

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**Population Affected:** Number: Or Percentage:  
Demographic:  
Geographic:

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**Other Concerns:**

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**Environmental Impact:** Ground:  
Air:  
Water:  
How to be controlled/Eliminated:

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**Critical Infrastructure at Risk:** Hard services (assets):  
Soft Services (program):  
How to be protected:

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**Existing Plan(s) if any:**

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**Trigger Event:**

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**Contingency Reserve:  
Cost and Schedule  
adjustments  
to project plan**

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**Allocate base funding  
for annual training:**

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**Fallback/Alternate Plan: (BCP)**

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# Next Steps in the Chatham-Kent Process

- Meet with municipal CEMC and hospital emergency planners to develop coordinated response strategy for commonly identified priority hazards and risks
- Reaffirm the sector that has the lead primary role and those with secondary roles
- Present strategies to administration of respective agencies for approval
- Communicate plans to front line staff of all involved agencies

**-Communicate-Communicate-Communicate-**

# Final thoughts...

A fundamental flaw that is undermining efforts in all areas of emergency preparedness.....

***“Currently, planners are developing emergency instructions for people to follow without finding out whether it is actually possible for them to do so or whether the instructions are even the most protective action for certain groups of people to take”***

–Redefining Readiness Study 2007

# Questions/Comments

## Contact

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