# Risk Assessment Tool for Medical Facilities

This document is a sample Hazard Risk Assessment tool for Medical Facilities. Its purpose is to assist Medical Facilities in identifying hazards or vulnerabilities they must plan for. It is intended as a guide to assist in priority setting within the construct of a comprehensive emergency management program.

## Risk = Probability x Impact

**Risk** is defined as the product of **probability** of the hazard and its potential **impact**.

## Probability

**Probability** may be expressed as the likelihood of an event occurring within a given time period; for example, the probability of event *x* occurring at a given location in the next year is *y*. Table 1 quantifies probability for a given event to assist in calculating risk.

Issues to consider for probability include, but are not limited to:

1. known factors
2. historical data
3. statistics from industry, other geographical areas, etc.

**Table 1**

| Probability Rating | Description | Detail |
|---|---|---|
| A | Highly Likely | nearly 100% probability in next year |
| B | Likely | between 10 and 100% probability in next year, or at least one chance in 10 years |
| C | Possible | between 1 and 10% probability in next year, or at least one chance in next 100 years |
| D | Unlikely | less than 1% probability in next 100 years |

## Impact

For the purpose of this hazard assessment, the **impact** should be assessed along three aspects of how the hazard being considered will affect the ability of the provider to deliver an appropriate level of service: **the human impact, the property impact and the business impact**.

The **Overall Impact Rating** then gives a picture of the effect on the Facility in the context of the healthcare and broader community. For example, the hazard may directly impact the staff, clients or the infrastructure that is critical for service delivery. In addition the hazard may result in illness or injury in the community and increased patient loads; if healthcare facilities need to be evacuated, the entire healthcare system will be impacted. An event such as a labour disruption, or a power failure may directly limit a provider's ability to deliver services while not directly impacting the rest of the region. Most events will impact both the facility and the community or region to varying degrees. The overall impact rating evaluates the potential hazard's impacts on the ability of the facility to deliver services.

The rating given for **human impact** should consider whether the hazard has/is:

1. unlikely to cause injury, illness or death in staff or patients
2. low probability of injury, illness or death in staff or patients
3. high probability of injury or illness in staff or patients; low probability of death
4. high probability of death in staff or patients

The rating given for **property impact** should consider whether the hazard is/will cause:

1. unlikely to cause physical plant or equipment damage requiring any replacement costs or recovery time
2. minor physical plant or equipment damage requiring some replacement costs or recovery time
3. moderate physical plant or equipment damage requiring moderate replacement costs or recovery time
4. extensive physical plant or equipment damage with high replacement costs and recovery time

The rating given for **business impact** should consider whether the hazard is/will cause:

1. unlikely to cause service interruption[1] or damage to public image of the institution
2. minor or limited service interruption or damage to public image
3. significant/widespread service interruption
4. unable to provide services

[1] Service interruption may include: employees unable to work, staff unable to access or leave facility, interruption of supplies, lack of financial reserves/cash flow, imposition of fines, penalties or other legal measures

**Table 2**
The **Overall Impact Rating** is the sum of the three impact factors for each hazard:

| | | |
|---|---|---|
| 4 | **Marginal** | Normal level of functioning or increased level of service required |
| 5-7 | **Serious** | Facility can provide a normal level of service with assistance from within region or within local community; or, facility can provide a reduced level of service with normal resources |
| 8-10 | **Critical** | Facility can provide a normal level of services with assistance from outside the local community or region; or, facility can provide a minimal level of service with normal resources |
| 11-12 | **Catastrophic** | Facility cannot provide services without extensive assistance from provincial or federal resources |

Combining the **Impact Rating** with the **Probability Rating** determines the **Risk,** as outlined in Table 3.

**Table 3: Risk Rating** [2]

| Impact Rating \ Probability Rating | A Highly Likely | B Likely | C Possible | D Unlikely |
|---|---|---|---|---|
| 11-12: Catastrophic | A11-A12 | B11-B12 | C11-C12 | D11-D12 |
| 8 -10: Critical | A8-A10 | B8-B10 | C8-C10 | D8-D10 |
| 5 – 7: Serious | A5-A7 | B5-B7 | C5-C7 | D5-D7 |
| 4: Marginal | A4 | B4 | C4 | D4 |

High  Moderate  Low  Very Low

**Using Table 3, planning may proceed with those events prioritized at the highest risk.**

[2] Adapted from: All-Hazard Assessment Model Version 3, Manitoba Health Disaster Management Services, June 2004.

| Medical Facility Hazard Risk Analysis Tool<br>Naturally Occurring Events | | | | | | |
|---|---|---|---|---|---|---|
| **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)** |
| Hurricane | | | | | | |
| Severe thunderstorm | | | | | | |
| Tornado | | | | | | |
| Blizzard | | | | | | |
| Extreme Heat | | | | | | |
| Extreme Cold | | | | | | |
| Ice Storm | | | | | | |
| Earthquake | | | | | | |
| Tidal Wave | | | | | | |
| Drought | | | | | | |
| Fire - External | | | | | | |
| Flood – External | | | | | | |
| Landslide | | | | | | |
| Volcano | | | | | | |
| Epidemic (Pandemic) | | | | | | |

| Medical Facility Hazard Risk Analysis Tool<br>Technological / Infrastructure Events (Internal/External) | | | | | | |
|---|---|---|---|---|---|---|
| **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)** |
| Electrical Failure | | | | | | |
| Generator Failure | | | | | | |
| Transportation Emergency | | | | | | |
| Fuel Shortage | | | | | | |
| Water Emergency | | | | | | |
| Sewer Failure | | | | | | |
| Fire Alarm Failure | | | | | | |
| Communications Failure | | | | | | |
| Medical Gas Failure | | | | | | |
| Medical Vacuum Failure | | | | | | |
| HVAC Failure | | | | | | |
| Information Systems Failure | | | | | | |
| Fire - Internal | | | | | | |
| Flood - Internal | | | | | | |
| Supply Shortage | | | | | | |
| Structural Damage | | | | | | |
| HAZMAT Exposure - Internal | | | | | | |

| Medical Facility Hazard Risk Analysis Tool<br>Human Related Events | | | | | | |
|---|---|---|---|---|---|---|
| **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)** |
| Mass Casualty Incident (Trauma) | | | | | | |
| Mass Casualty Incident (Infectious) | | | | | | |
| Terrorism - Biological | | | | | | |
| VIP Situation | | | | | | |
| Infant Abduction | | | | | | |
| Hostage Situation | | | | | | |
| Civil Disturbance | | | | | | |
| Labour Action | | | | | | |
| Forensic Admission | | | | | | |
| Bomb Threat | | | | | | |

| Medical Facility Hazard Risk Analysis Tool<br>Events Involving Hazardous Materials | | | | | | |
|---|---|---|---|---|---|---|
| **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)** |
| Mass Casualty HAZMAT Incident | | | | | | |
| Small Casualty HAZMAT Incident | | | | | | |
| Chemical Exposure - External | | | | | | |
| Small – Medium sized Internal Spill | | | | | | |
| Large Internal Spill | | | | | | |
| Terrorism - Chemical | | | | | | |
| Radiological Exposure - Internal | | | | | | |
| Radiological Exposure - External | | | | | | |
| Terrorism - Radiologic | | | | | | |

Source documents:


1. Kaiser Permanente Medical Center Hazard and Vulnerability Analysis
2. All-Hazard Assessment Model – Manitoba Health Disaster Management
3. Integrated Hospital Emergency Management System – OCIPEP, 2001
4. CBRNE Plan checklist – A Template for Healthcare Facilities - 2002