

ASSINIBOINE REGIONAL HEALTH AUTHORITY

REGIONAL HAZARD ASSESSMENT

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Regional Hazard Assessment

Introduction

The Assiniboine Regional Health Authority (ARHA) developed a strategic plan for a Regional Disaster Management Program in March, 2003. That plan adopted the Integrated Disaster Management Model as a tool to utilize in the creation of a comprehensive program. Completion of this Regional Hazard Assessment is an initial step of the Integrated Disaster Management Model. The Risk Assessment template, compiled by the Office of the Fire Commissioner (OFC) has also been considered in the development of an all Hazards Approach to planning. An all-hazard assessment model was provided by Manitoba Health and utilized in the hazard assessment. Formatting of information in this document relates to that All-Hazard Assessment Model.

The information contained in this report is an initial compilation of data as the All-Hazards Assessment Model has not been utilized previously. It is recognized that the information contained in this report will be further updated and refined as hazard assessments are reviewed and revised in future years. Addendums to this report will occur as further information is received from community agencies.

This report will be shared with other agencies that provide health care services and local authorities within the ARHA. It is recognized that emergency and disaster situations that occur within the Region may impact more than one community and may require coordinated responses from a variety of groups and agencies including First Nations and Inuit Health Branch (FNIHB).

Please refer to Manitoba Hazards: Consequences and Implications for the Health Sector: A Summary of the Hazard and Risk Management Committee's Hazard Assessment Process and Findings published by Manitoba Health Disaster Management in September 2004 as it provides detailed information regarding hazards discussed in this report.

1.0 Hazard Assessment Committee

Committee Membership- Disaster and Emergency Preparedness Committee(DERPC):

- a) Neil Gamey, Emergency Preparedness Officer (EPO)
- b) Dorinda Stamford, EMS District Coordinator
- c) Ken Oberlin, EMS District Coordinator
- d) Marilyn McGregor, Area Manager
- e) Judy McFadden, Education Services
- f) Kathy Langford, Facility Coordinator
- g) Steve Geletchuk, EMS, Fire Inspector
- h) Norma Holmes, EMS, Disaster Plan Chairperson
- i) Brent McDonald, EMS, Exercise Coordinator
- j) Curt Smith, Maintenance

1.1 Sources of Information

Information has been sought from Transport Canada (Dangerous Goods Section), Manitoba Hydro, Manitoba Telephone, Natural Resource, Fire Department (Mutual Aid Districts), Office of the Fire Commissioner, and Municipal Councils. The Disaster and Emergency Response Planning Committee is confident that the data supplied by these agencies is reliable. A member of the ARHA Disaster and Emergency Response Planning Committee met with Regional Facility & Client Care Coordinators to complete a facility hazard assessment. Information was also gathered from an assessment that local authorities completed on their community. This assessment indicated more of the social/financial issues than health issues.

2.0 Regional Profile

The following describes the region in its entirety:

2.1 Geography

The Assiniboine RHA covers an area of 32,134 square kilometers, expanding from the northwestern point of the Saskatchewan border in the Rural Municipality of Shellmouth-Bolton near the community of Russell, continuing down the Saskatchewan border where it meets the USA border, and extends south-east to the Rural Municipality of South Norfolk near Treherne and north to the Rural Municipality of Glenella in the Neepawa area, including Riding Mountain National Park. Brandon, the major centre servicing the Assiniboine RHA, is within 30-90 minutes of most communities in the region. The towns at the eastern end of the Region are within 90 minutes of the city of Winnipeg. Russell, located at the northwestern point of the Region, is approximately 30 minutes from the City of Yorkton, Saskatchewan. The Trans Canada, Highway #1 and Yellowhead Highway, #16 and Highway #10 are major transportation corridors within the Region.

2.2 Property

Farming is the primary industry within the region, although some communities have independent industry, including: Erco at Virden, McCain at Carberry, Mohawk at Minnedosa, Springhill Farms at Neepawa. Hazardous materials are transported on road and rail throughout the region.

The ARHA operates 20 Acute Care Facilities with 3 sites that routinely do surgery. Due to staff shortages, there have been a shift in service at some of these facilities. Four facilities provide a Cancer Care program in partnership with Cancer Care Manitoba. The ARHA Diagnostics Program provides diagnostic services to facilities and programs including X-Ray, EKG, Ultrasound and Laboratory exams.

There are 28 Personal Care Homes across the Region with a total of 917 beds.

The Home Based Services Programs provided direct service to 2584 clients in 2005/06. Child and Adolescent Services had 250 active cases, Adult programs have approximately 500 active cases and Mental Health for the elderly have 250 active cases in any given year.

Housing standards vary across the region but it appears that affordable housing alternatives are available throughout, with some shortages identified in First Nation Communities. Affordable housing and assisted living housing are a priority for the senior population.

2.3 Infrastructure

Electrical and telephone service is provided to all communities within the Region. Communities have a source of safe drinking water, most rural homes have a private wells, and the communities surrounding Minnedosa, Virden have a piped supply of town water to their rural homes. A natural gas pipeline passes through the centre of the ARHA.

There is an elaborate network of roadways which includes three major thoroughfares, those being Highway #1 (TransCanada), Highway #16 (Yellowhead), and Highway #10. Various types of hazardous materials are transported on these major roadways.

CN and CP Rail have main lines that run throughout the region and various hazardous materials are carried along these routes at times.

2.4 Demographics

The population of the ARHA is 69,371 (2004). This remains approximately 5.9% of the population of Manitoba, with 18.6% of residents under the age of 15, compared to 20% provincially and 19.2% of residents 65 years and older, compared to 13.5% provincially. The population of the Assiniboine RHA is older than that of the Manitoba average.

Assiniboine has a lower percentage of Aboriginal people among its residents (8%) than Manitoba (14%) according to the Census in 2001. There are 7 First Nation Communities in the ARHA. There are a large number of Metis Nation people in and around the St. Lazare area. There are 17 Manitoba Metis Federation locals in the region. Less than 1% of residents of ARHA identified themselves as belonging to any visible minority group.

The population density is 2 persons per square kilometer.

The ARHA is the primary health care provider within the boundaries of the region. Services are shared with other agencies in some communities, i.e. Health Canada (FNIHB). Services unavailable in the region are primarily available in the Brandon RHA and Winnipeg RHA, Central RHA, and Saskatchewan .

Household incomes in the ARHA appear to be lower than those of all Manitoba households combined in 2001. The average household income in Assiniboine was \$40,169, compared to \$50,756 for all Manitoba households combined. In Assiniboine the median household income was \$32,651, compared to \$41,661 for all Manitoba households combined.

Some community members explained that lack of health benefits may limit access to care that is not covered (i.e. medications, dental and vision care, ambulance services). Rates of unemployment in the region have historically been low.

Access to health care providers (i.e. Physicians, Nurses, Diagnostics) is a concern due to the lack of resources. Residents that traveled outside of the ARHA for health care services did so mainly because the services were not available in the region or that they were referred to another physician.

Larger communities in the ARHA have Elementary Schools and have available child-care facilities.

2.5 Response Agencies

The ARHA operates 25 ambulance stations with 32 ambulances and 1 First Response Station. The training level of EMS providers has been steadily increasing over the past several years. The average time it took to respond to a primary call in 2002/03 was 3.57 minutes. The ARHA currently have 28 -Paramedic II , 86 - Paramedic I, 28 - EMR , 50 - BFA.

The majority of residents of the ARHA have access to 24 hour Police/Fire/Ambulance service and also have access to an open emergency department within 50 kms.

A regional EMS Response to HazMat team has been trained to Level I and conducts quarterly continuing education sessions, and an annual exercise.

Mutual Aid districts in the region have firefighters trained to a HazMat Operations Level and a HazMat Technician team is available through Office of the Fire Commissioner (OFC) - within 1-2 hours.

The ARHA has developed an Incident Command Structure which includes links to outside agencies such as: Local Authorities, MEMO, Manitoba Health, Police services, Fire Departments, etc. that is included in the Disaster Plan.

9-1-1 is available to all municipalities and First Nation Communities with the exception of Birdtail Sioux First Nation, Keeseekowenin First Nation, and Waywayseecappo First Nation.

2.6 Organizational Issues

One of the main challenges faced by the populations of the ARHA is dispersion of population over a vast area. Movement of personnel and supplies in the event of a disaster is influenced by the distance across the region. Because of small populations, it is usual that health care providers would be closely connected to patients that they would be caring for in an emergency or disaster situation.

3.0 Hazard Identification

Potential consequences and impacts information contained in the following section is taken from the document published by Manitoba Health Disaster Management in September, 2004 that is titled “Manitoba’s Hazards: Consequences and Implications for the Health Sector”. Information contained in the chart in the column title “Possible Hazard Impacts” in section 4.0 is related to the information Manitoba Health provided in potential consequences and impacts.

3.1 Biological Incidents Potential Consequences and Impacts:

Health: Biological incidents can have serious impacts on general health. Potential impacts include respiratory, gastrointestinal and neurological symptoms, poisoning, dehydration from excessive vomiting or diarrhea and other disease specific symptoms. Possible illnesses may include fevers, headaches, body aches, swollen lymph nodes, infections, allergies and long-term health effects that lead to chronic illness (different diseases and infections can have different presenting symptoms). Multiple casualties are also possible. Mental health issues may arise due to the high degree of dread people associate with water contamination and widespread disease incidents; vulnerable populations (e.g. young, elderly, immuno-compromised) face higher levels of risk and can exhibit enhanced anxiety. The health sector including service delivery, may be affected by potential risks to health facilities from staff or facility contamination, by facility evacuation and/or quarantine, and by the added burden of evacuee reception for facilities that may already be busy. There may be a significant increase in demand on the health system at a time when the availability of health services may be reduced by staff illness.

Transportation: Worker illness and absentee rates could affect supply chain reliability (e.g. if illness reduced the number of transport drivers available, delivery would be affected). Community access may be restricted for safety reasons. Airport ramp areas and terminals may be directly impacted by the arrival of possible infectious disease passengers and the need for physical isolation areas.

Utility Disruptions: Potential exists for the contamination of either surface or aquifer municipal water supplies. Widespread illness-related human and material resource shortages may impact on utilities.

Evacuation: Health facilities may require urgent or precautionary evacuations. Problems may arise if receiving facilities are unable to handle additional clients.

Damage to Structures: Physical damage is unlikely but infection control measures may restrict usage.

Economic Impacts: Both short and long-term economic impacts will depend on the magnitude of the incident. Significant economic impacts are possible.

3.2 Tornadoes Potential Consequences and Impacts:

Health: Tornadoes have the potential to cause very significant impacts on general health. Injuries can include trauma from structure collapse and flying debris. Multiple casualties are very possible, therefore warning systems need to be utilized and heeded. Mental health issues include the potential for loss of life (family, friends, etc.) and the frightening nature of experiencing a tornado. The health sector and service delivery can be impacted if health care facilities are damaged or if transportation routes are directly damaged or blocked by debris and staff are unavailable.

Transportation: Roads may become impassible due to downed trees, power lines or other windblown debris. Convergence may occur as emergency vehicles and sightseers arrive at impacted areas. Supply chains may be disrupted if roads are blocked and staff may have difficulty getting to or from work. Use of air ambulances may be temporarily disrupted, requiring alternate means of transport.

Utility Disruptions: Downed power lines may disrupt power for a few hours or up to several days in cases of widespread wind damage. Communications may temporarily go down; therefore redundancy is important.

Evacuation: Evacuation of health facilities is unlikely but may occur if the facility is damaged or suffers a prolonged power outage. Community evacuations are unlikely unless there is extensive damage or secondary impacts (e.g. HazMat incident caused by a tornado).

Damage to Structures: Fires in facilities are a potential risk associated with generator use, lightning strikes or downed power lines. Flood and water damage may occur from sewer backup or overland flooding caused by extensive rainfall. Structural damage is highly likely from strong winds and hail, especially with older buildings or those with loosely fastened fixtures.

Economic Impacts: It is possible that there may be moderate short and long-term economic impacts from a tornado; these depend primarily upon the type and extent of damages incurred.

3.3 Flood Potential Consequences and Impacts:

Health: Flood events have the potential to significantly impact general health. Potential injuries include drowning, electrocution, hypothermia, fatigue, exhaustion and physical trauma. Long-term illness and public health concerns arise from possible exposure to moulds, contaminated water (especially from wells) and exposure to other harmful agents during cleanup and reentry. In flash flood events the likelihood for multiple casualties exists. There can be significant and prolonged mental health impacts from experiencing a serious flood, including stress from evacuation, loss of life, damage to property and quality of life. The health sector and service delivery can be impacted by the occurrence of several different incidents; there is a potential for health facilities to be evacuated, damaged or isolated, staff could be displaced, transportation routes could be cut and there could be an increased demand on alternate transportation services.

Transportation: Overland flooding may disrupt all normal means of transportation. Access may be disrupted when roads are cut by floodwaters or blocked by temporary dikes and bridges may be washed out or impassible due to high water. Disruptions may be temporary (during the event) or more long-term, when the damages are significant. If road or bridge access is lost, supplies may go undelivered or be delayed by lengthy detours (impacting both consumers and suppliers of goods and services). Loss of road access may also prevent staff from getting to work and staff themselves may be victims who have had their homes impacted by flooding. Many health programs, such as home care and dialysis, require staff and patients to travel extensively. Air travel may be disrupted if local landing strips are flooded or isolated.

Utility Disruptions: Backup power supplies are essential as power may be disrupted during an event. If road and bridge access is lost, interruption of fuel supplies and subsequent shortages may occur for facilities dependent upon propane or oil. Communications may be disrupted and data networks may go down. Disruption of access to potable water may result in boil water orders and/or the use of alternative supplies. There is also the likelihood that sewage and waste systems will be impacted by a flood event – both individual and community septic fields can be adversely effected and sewer backup into facilities and dwellings is likely.

Evacuation: Precautionary evacuation of health facilities is possible when the threat of isolation exists. Urgent evacuations are possible when a facility is directly threatened by flooding. Community evacuations are possible in flood events – this ranges from individual household evacuations to evacuations of entire communities with higher magnitude floods. Evacuation into other communities and facilities is a possibility and reception plans will aid this process.

Damage to Structures: Floodwaters may severely damage the contents of buildings and cause significant structural damage that will require repairs. Additionally, depending on the extent of floodwater damage, issues relating to sanitation and the development of mould may arise. Aesthetic damage is possible as the grounds of a facility may be impacted (e.g. access ways, outbuildings, parking lots, etc. may require repairs). Fire may occur in a facility if power has not been shut off and live electrical systems are flooded.

Economic Impacts: Flood events can have significant short and long-term economic consequences for individual homeowners, communities and institutional agencies. Financial management plans will aid recovery.

3.4 Severe Summer Storms Potential Consequences and Impacts:

Health: Severe summer storms have the potential for significant impacts on general health. Injuries associated with summer storms include trauma from structure collapse, hail and lightning. Illness and public health concerns may arise due to mould and water contamination issues and decreased access to care and medication. Multiple casualties are possible from tornadoes, lightning strikes, hailstorms or structure collapse. The risk of multiple casualties is enhanced due to the seasonal nature of the hazard; summer events and gatherings can place large numbers of people at risk. The health sector and service delivery may be impacted by summer storms as facilities may be damaged or isolated by flooding, transportation routes may be temporarily disrupted and staff may be unavailable for various reasons.

Transportation: Roads may become impassible due to reduced visibility, flooding and downed trees or power lines. As such, supply chains may be disrupted and staff may have trouble getting to or from work. Severe storms may also curtail air travel until conditions improve and travel is safe.

Utility Disruptions: In cases of widespread wind damage, downed power lines may disrupt power for a period of hours or for several days. Communications and data networks may also be affected. Sewer backup and associated flooding is possible in heavy rainfall events that overburden sewer systems.

Evacuation: Evacuation of health facilities may be possible if the facility is damaged or experiences a prolonged power outage. Entire communities may be evacuated if power outages are for extended periods of time.

Damage to Structures: Facilities are at risk from fires caused by lightning strikes or generator use. Water damage is possible from sewer backup or overland flooding from heavy rainfall. High winds and hail can cause structural damage, especially to older buildings or those with loosely secured features.

Economic Impacts: Moderate short-term economic impacts are possible for population health and communities. Long-term financial impacts may result from flooding and hail damage to vehicles, crops, etc.

3.5 Severe Winter Storms Potential Consequences and Impacts:

Health: Severe winter storms can have significant impacts on general health. Potential injuries include hypothermia, frostbite, trauma (from transportation accidents, structure collapse, etc.), carbon monoxide poisoning and heart attacks. Winter storm incidents may exacerbate existing illnesses in vulnerable populations (e.g. people with pneumonia) and may create difficulties for accessing care and medications. Multiple casualties are possible from large transportation accidents, structure collapse and carbon monoxide poisoning. The health sector and service delivery may be impacted if facilities are damaged or isolated, if transportation is disrupted and if staff are unavailable.

Transportation: Roads may become impassible or extremely treacherous due to snow or ice and visibility may be reduced significantly due to blowing snow. Consequently, transportation disruptions may be widespread and prolonged. Suppliers of goods and services may be directly impacted and staff may have difficulty getting to or from work. Air travel may be disrupted if runway conditions and visibility are poor. Public communication of conditions is necessary to prevent accidents.

Utility Disruptions: Power may be disrupted by downed power lines for a period of hours or up to several days in cases of widespread ice damage. Fuel shortages or interruptions are possible if roads are blocked; this may be problematic for facilities dependent on propane or oil. Communications may go down and alternatives could be required. Internal pipes may freeze if heat is lost during a power disruption and water main breaks are possible during extreme cold.

Evacuation: Evacuation of health facilities is unlikely but may occur if the facility is damaged or suffers a prolonged power outage. Evacuations involving entire communities are unlikely.

Damage to Structures: Fires in facilities are possible if generators or alternate heat sources are being utilized. Some water damage to facilities may occur if water pipes freeze and burst. Structural damage is possible from heavy snow loads accumulating on roofs, especially with older buildings.

Economic Impacts: Short-term economic impacts may arise from severe winter storms and their consequences (e.g. prolonged power outages). Long-term economic impacts are unlikely.

3.6 Urban Interface Wildfires Potential Consequences and Impacts:

Health: Urban interface wildfires can significantly impact general health, causing injuries such as burns and smoke inhalation. Potential illnesses may include aggravation of existing respiratory conditions and difficulties for elderly populations and people with chronic illnesses. Multiple casualties can result from fires in large office buildings or multiple unit dwellings because of the large number of people that may work or reside in them. Mental health stress issues arise from evacuations and the potential for loss of life and property. The potential exists for health facilities to be damaged. Public health issues include smoke inhalation and reentry into damaged buildings. The health sector in receiving communities may be busy and as a result, the delivery of health services may be slowed down or reduced in some capacity.

Transportation: Fires can cross roads, access to communities may be restricted for safety reasons and smoke can cause road closures due to reduced visibility. If roads are impassible, evacuations may have to be carried out by air and supplies may be undeliverable. Smoke may make takeoff and landing difficult or impossible for aircraft and airports may be directly impacted by wildfires. If air travel is disrupted, certain supplies may not be available. In communities on-site staff may be limited and loss of access may prevent the entry of replacement staff.

Utility Disruptions: Since fire can cut off power, backup sources are needed. If pipelines are impacted, fuel shortages or interruptions may occur. Since communications infrastructure may be damaged by fire, at-risk facilities need to be protected and redundancy is required. If water and/or sewage and waste infrastructure is damaged there is potential for a loss of potable water, loss of access to water supplies and increased chance of sewage and waste spills (or loss of use).

Evacuation: Smoke from wildfires may cause the evacuation of health care facilities or entire communities prior to the immediate threat from the fire. Health care facilities and PCHs may also serve as reception centres for evacuees and will need to be prepared accordingly. All evacuees not going to a health facility will also require accommodation.

Damage to Structures: The potential exists for both fire and structural damage in health facilities and in all other buildings and infrastructure. Fire fighting and sprinkler use during a fire may result in water damage within the impacted buildings. Adjacent buildings may also be impacted.

Economic Impacts: Both short and long-term economic impacts are possible and depend primarily upon the extent of damages.

3.7 Transportation Accidents Potential Consequences and Impacts:

Health: Transportation accidents have the potential for serious impacts on general health. Possible injuries may include trauma, burns (thermal) and temperature-related illnesses, such as hypothermia (less likely). Multiple casualties may be a major issue for such events, as large numbers of patients can arrive at health facilities in a short period of time (e.g. 40 patients could arrive in one hour). The initial casualties presenting at the closest medical facility are likely to be brought by members of the public rather than through the emergency medical system. This means they did not go through a formal triage process at the scene and therefore may not be reporting to the most appropriate facility or may overwhelm the nearest facility. The health sector and service delivery may also be affected as facilities receiving the injured may already be busy and as a result, may have to divert and decant patients to other facilities to accommodate the new arrivals. Mental health impacts are possible for both victims and their families and other health impacts can include long-term injury and recovery issues.

Transportation: Road access may be temporarily restricted or blocked off due to an accident (e.g. in cases where a plane crashes on a traffic route or if there is an accident at a railway crossing). Alternate route plans and public communication may be needed to prevent convergence at the site. Police may be required to direct traffic and prevent further mishaps. Aircraft takeoffs and landings may be disrupted or diverted if runways are impacted by an accident. Supply transport and delivery could be affected if road access is blocked or temporarily restricted or if airports or railways are closed (directly impacting suppliers). For some incidents it may be necessary to call in off duty staff to assist.

Utility Disruptions: Though not likely it is possible that power lines or other utilities may be damaged in an accident. Some communities that rely on having fuel oil and gasoline transported in, often on winter roads, for heating and to run generators may experience utility disruptions if transportation accidents interrupt this supply chain.

Consequences and Impacts – Potential for Evacuation: There is a potential for limited evacuations around the scene of an accident. A transportation accident that blocks access to an isolated community may make it more difficult to evacuate that community.

Damage to Structures: Though not a common occurrence, it is possible that structures, including health facilities, may be damaged in a transportation accident. Facilities located near aircraft flight paths, main rail lines and major intersections may be at greater risk.

Economic Impacts: The potential for short or long-term economic impacts from transportation accidents is relatively low, unless the accident causes significant and prolonged damage to critical transportation infrastructure (such as a train derailment on the Churchill line).

3.8 HazMat Incidents Potential Consequences and Impacts:

Health: HazMat incidents can be quite severe and exhibit the potential for significant consequences and impacts on general health and the health system. Injuries can include burns (thermal, chemical), trauma, respiratory problems (smoke inhalation, toxic inhalation), poisoning (inhalation, dermal) and ocular diseases. Long-term exposure illnesses, cancers and multiple casualties are also possible consequences of HazMat incidents. Mental health issues may include stress from evacuation, loss of life and property; feelings of dread associated with the thought of HazMat incidents can also create mental health issues. Toxicity and environmental health issues fall under the realm of public health. The health sector and service delivery could be impacted by the potential for damage to health facilities.

Transportation: A major transportation consequence is that road access into communities can be restricted for safety reasons. If roads are impassable or if access is limited, supply vehicles may be blocked and staff may be unable to get to work (which would create changeover problems). Also, air travel may be impacted, as airports are vulnerable sites for HazMat incidents.

Utility Disruptions: The potential exists for utility disruptions with one of the major concerns being the contamination of potable water supplies. Demands for water by firefighters may strain local water supplies. Power outages, fuel shortages or interruptions, communications disruptions and sewage problems are possible issues, but not normally a concern in HazMat incidents.

Evacuation: Evacuation of health care facilities and entire communities may occur urgently or for precautionary reasons during a HazMat incident. Hospitals and PCHs may be identified as potential reception locations for evacuees in the event that evacuations are carried out.

Damage to Structures: The potential for damage to health care facilities exists and consequently, appropriate mitigation and preparedness issues need to be taken into consideration (e.g. site specific risk evaluations and structural mitigation measures need to be implemented). Facilities are at risk from fire and water damage, as well as from general structural damage from an incident.

Economic Impacts: Both short-term and long-term economic impacts are possible, but depend on the extent of damages incurred during an incident. Emergency response and clean up operations can be costly.

3.9 Fire Incidents Potential Consequences and Impact:

Health: Fire incidents can have serious impacts on general health. Possible injuries include burns, smoke inhalation and trauma caused by debris from fire related explosions. Potential illnesses may include aggravation of existing respiratory conditions and difficulties for the elderly and people with chronic illnesses. Multiple casualties are possible and all of the at-risk people in a facility may be affected at the same time. Mental health issues include stress from evacuations and other emotional impacts for those who experience property damage or the loss of lives in a fire event. Public health issues may arise in regards to smoke inhalation and possible safety concerns about reentry into damaged buildings. The health sector and service delivery can be affected by the potential for damage to health facilities, the fact that facilities receiving evacuees and casualties may be busy for a few days to a few weeks and that people impacted by smoke may quickly overwhelm local health resources.

Transportation: Road access into communities may be restricted for safety reasons (e.g. smoke can cause reduced visibility). Air evacuations to burn wards may be necessary. If a major health care supply distribution centre is impacted, it will impact availability and services (e.g. if supplies are distributed from a central hospital and it is damaged, problems will arise for other facilities). In communities on-site staff may be limited and getting replacements may be difficult.

Utility Disruptions: Fires can result in power supplies being cut off and communications being damaged. General planning is needed in case water supplies, including potable water, are impacted. Damage to sewage and waste infrastructure may be problematic and water runoff from fire fighting may create contamination issues (e.g. if runoff were to come from a laboratory).

Evacuation: Health care facilities and entire neighborhoods may be evacuated urgently or for precautionary reasons. Fire damage to a facility's critical infrastructure, such as its power systems, may require evacuation. Hospitals and PCHs may need to be utilized for evacuee reception.

Damage to Structures: The potential exists for fires to cause severe structural damage to health care facilities, other buildings and infrastructure. Water damage is possible from fire fighting and sprinkler systems.

Economic Impacts: Short and long-term economic impacts will depend on the severity of the incident and extent of damages.

3.10 Social Disruption Incidents Potential Consequences and Impacts:

Health: Social disruption incidents have the potential for serious general health consequences. Possible injuries may include trauma (from explosions, fighting or from objects such as bricks, rocks and bottles being thrown), respiratory difficulties (from gas, smoke or toxic inhalation) and burns. It is important to note that the potential risk of injury applies not only to the general public involved in social disruptions, but also to the police and security personnel that may be dealing with the incident. In the event of injuries, parallel but separate treatment resources may be necessary to maintain separation of the parties involved. Potential illnesses may arise from exposure to tear gas and other crowd dispersing measures. Public health issues may include environmental health issues and long-term injuries sustained during violent incidents. Mental health issues may arise from the stress associated with these types of incidents and potential post-event cultural backlash. The health sector and service delivery may be impacted by mass casualties, damage to health facilities, evacuations and the fact that receiving health facilities may already be unable to handle additional clients.

Transportation: Community access may be restricted for safety and security reasons (e.g. quarantine) and demonstrators may target critical routes for blockades. If roads are impassible, supply vehicles may be unable to get through and staff replacement may be difficult. Airports and aircraft may be directly impacted. If air travel is shut down there may be problems for 'just in time' products.

Utility Disruptions: Widespread utility disruptions are possible as power grids and pipelines may be targeted. Communications networks may become overloaded (e.g. widespread power failure leads to overuse of phone lines). Sewage and waste infrastructure may also be impacted by a power failure.

Evacuation: Large scale or community wide evacuations are unlikely. It is possible that access to a particular area is limited for safety concerns.

Damage to Structures: There is a potential for structural damage, including fire damage, associated water damage from fire fighting and sprinklers, and structural damage in all buildings and infrastructure, including health facilities.

Economic Impacts: Short and long-term economic impacts are possible and depend on the type of incident and degree of damage. Damage to structures can result in significant short-term economic costs.

3.11 Utility Disruption Potential Consequences and Impacts:

Health: Utility disruptions can have significant impacts on general health. Potential injuries include burns and trauma from explosions or secondary accidents, respiratory difficulties from smoke or gas inhalation and carbon monoxide poisoning from generator and portable heating device usage. If phone lines stop working or become overloaded the public may be unable to call for help (i.e. no access to 9-1-1). Prolonged power outages result in citizens becoming sick with heat related illnesses, contracting food related illnesses due to spoilage or contaminated water supplies or if there are disruptions in the operation of in-home medical equipment. Mental health issues may arise from stress associated with evacuation, loss of life or property and fear (e.g. people may think that a widespread power outage is the result of terrorism). Public health concerns include environmental health issues (potentially long-term) and cases where homes are left without heat or water supplies are disrupted or contaminated. The health sector and service delivery could be impacted by the potential for damage to health facilities and the loss of services. Other impacts may include that in the event of evacuations receiving facilities may already be busy and that it is difficult to deliver services without power, water, gas, etc. Redundancy planning is important because many generators are gas powered and of little use when gas supplies are cut off.

Transportation: Road access into communities may be restricted for safety reasons. It may be difficult to replace staff if their homes and families have been affected by an incident.

Utility Disruptions: The interconnected nature of utility systems raises the risk of a 'domino' affect where one failure leads to other failures. The potential for power outages to generate other system failures is a major issue. Fuel shortages are possible if pipelines are impacted. Communications disruptions to voice and data networks may produce secondary or ripple effects and work interruptions may occur. Water supplies, including potable water, may be restricted, polluted or contaminated. Waste/sewage infrastructure may be inoperable, resulting in pollution through untreated sewage discharge or backup.

Evacuation: Evacuation of health facilities may occur urgently or for precautionary reasons. Loss of power or water supplies in health facilities could have serious consequences for intensive-care patients. Hospitals running on reduced generator power may be required to reduce consumption, limit services available and re-route or discharge patients. Facilities that are left without heat due to a power outage may need to be evacuated. Hospitals and PCHs may receive evacuees from other facilities. Parts of communities may also be evacuated urgently or for precautionary reasons.

Damage to Structures: Utility disruptions, especially resulting in the loss of heating or other critical safety services, may result in damage to facilities.

Economic Impacts: Short and long-term economic impacts are possible but depend on the type and extent of damages.

3.12 Terrorism Potential Consequences and Impacts:

Health: Terrorism incidents can have serious impacts on general health. Possible injuries may include trauma (from bomb explosions or structure collapse), respiratory difficulties (from gas, smoke or toxic inhalations), burns (thermal or chemical) and chemical exposure (nerve agents). Potential illnesses may include cancers and other long-term exposure illnesses. Public health issues include environmental health issues and possible communicable diseases. Mental health issues may arise from stress associated with evacuations, loss of life and property, the high degree of dread that people associate with terrorism and potential post-event cultural backlash. The high level of fear generated can have significant ramifications for the health sector, as the mere existence of a terrorist threat may cause public convergence on health facilities and result in an overwhelming use of resources. The health sector and service delivery may also be impacted by mass casualties, damage to health facilities, evacuations and the fact that receiving health facilities may already be busy. There is also a significant risk for emergency personnel who respond to an incident because impacted sites may pose a significant threat well after the initial incident. For example, many of the firefighters who responded to the 9/11 terrorist attacks entered the buildings immediately after the planes impacted and nearly 350 of those personnel lost their lives when the towers collapsed soon thereafter. There have also been cases where terrorists intentionally left additional explosive devices at a site in order to target the first responders.

Transportation: Community access may be restricted for safety and security reasons (e.g. quarantine) and critical routes may be targeted for destruction by terrorists. If roads are impassible supply vehicles may be unable to get through and staff replacement may be difficult. Airports and aircraft may be directly impacted (e.g. in the 9/11 attacks aircraft were used as weapons and no-fly zones were established). If air travel is shut down there may be problems for 'just in time' products.

Utility Disruptions: Widespread utility disruptions are possible as power grids and pipelines may be primary targets of terrorism. The potential also exists for utilities to be impacted in a secondary manner. For example, in February 1993 a bomb was detonated in the parking basement of the World Trade Center; while the building structure was the intended target, the explosion also ruptured sewage and water lines. There is a strong possibility that communications may become overloaded during a terrorist event (e.g. a large-scale terrorist attack may lead to overuse of phone lines). Contamination of potable water is possible if terrorists target supplies.

Evacuation: Health facilities and entire communities may be evacuated urgently or for precautionary reasons (e.g. bomb threat or scare). Hospitals and PCHs may receive evacuees in these instances.

Damage to Structures: There is a potential for fire damage, associated water damage from fire fighting and sprinklers and structural damage in all buildings and infrastructure, including health facilities. The potential exists for entire buildings to be destroyed, as occurred on 9/11 with the World Trade Towers.

Economic Impacts: Short and long-term economic impacts depend on the type of incident or threat and the degree of damage. The destruction of essential facilities could result in economic hardships. Tourism and other industries can be directly affected as occurred after 9/11, when airlines lost billions of dollars due to an enhanced fear of

flying. Other areas that may be impacted include border security, immigration and the insurance industry (e.g. increased premiums, trade restrictions, slower border crossings).

3.13 Contributing Factors to Hazards

A number of secondary or tertiary factors exist that can contribute to the severity of hazard incidents. All of the consequences and impacts described in the preceding hazard sections can be compounded and made worse by potential contributing factors. As such, contingency planning is essential to account for contributing factors, to ensure the continuity of services and to reduce the effects of potential consequences and impacts.

The Potential for Multiple or Combined Impacts: A significant danger exists from the possibility that hazard events can occur in unison and result in multiple or combined impacts. For example, the occurrence of a serious blizzard in the Red River Valley could result in the closure of highways and the Canadian-U.S. Border Crossing for a period of time. As a result, stranded travelers may be forced to reside in a local hockey arena until conditions have subsided and roads are reopened. The potential for a combined hazard event exists in such a scenario, as large amounts of snow could build up on the roof of the arena and cause a structural collapse. With a large number of stranded travelers residing in the arena, who would normally not be there, the potential for a serious mass casualty event is significantly increased. Such an event could overwhelm a smaller rural health facility (with limited staff and resources) that would be responsible for dealing with the extreme influx of patients. Another instance is the potential for separate hazard events to occur in different areas of a province relatively close in time. For example, during the summer months of 2003, British Columbia experienced serious forest fires that exhausted local resources. Shortly thereafter in the fall, a serious flood event occurred. Provincial emergency resources and personnel had already been stretched to their limits and were overburdened from one event when another, unrelated, devastating event occurred.

The Potential for Workforce Interruptions: All sectors may experience workforce interruptions. Interruptions may result from a collective bargaining process or other causes where staff in a particular occupational and/or geographic area cannot or will not report to work. The potential for province/system wide workforce interruptions always exist. Interruptions within the health sector can have serious consequences for the health sector and service delivery; interruptions in sectors other than health can also have significant health impacts. For example, in June/July 2002, Toronto, ON experienced a crippling two-week long strike that included garbage collectors. As a result, massive amounts of garbage accumulated in streets, parks and parking lots (this became a serious health concern as hot temperatures caused rapid decomposition). Simultaneous labour issues may exist that can compound problematic situations (e.g. issues may arise when problems occur in more than one province at the same time). This can affect negotiations and complicate inter-provincial mutual-aid agreements. Essential service agreements may influence the level of staff availability in some circumstances.

Workforce interruptions occur occasionally and are probable in any year. Walkouts can occur at any time and their likelihood varies according to the expiry dates of collective agreements. As such, contingency planning is critical and should be started as soon as there is an indication of an impasse in negotiations. Illegal strikes, refusal to work overtime, information pickets and walkouts are all quite difficult to predict and tend to be uncommon. Strike lengths are quite variable and impacts have a tendency to vary based on the capacity of the area affected. If one facility or service goes down it is likely, due to region wide collective agreements, that a broader area will be impacted, encompassing and affecting other facilities and services. Pertinent issues to be considered include those of different interest groups and whether or not employees will cross picket lines. Public

safety and essential services legislation may apply or agreements may be negotiated as safeguards.

The Potential for an Increase in Demand of Health Services: At certain times of the year some regions may experience a significant temporary increase in population numbers (e.g. summer rock festivals in rural towns or during long weekends in cottage country and at campgrounds). If a hazard incident were to occur and result in mass casualties during these times, smaller rural health facilities may be overwhelmed.

The Potential for a Decrease in the Provision of Health Services: Another important contributing factor is a decrease in available health services. For instance, on civic holidays health facilities may be operating with fewer staff. If a major hazard incident were to occur causing mass casualties, a facility operating in a reduced capacity may not be sufficiently equipped to deal with an influx of patients. Depending on the type of incident, additional staff may have to be called in and may be unavailable; significantly reducing the capability of the facility to deliver the required level of service. Facilities in the ARHA have had to reduce Emergency and Acute Services on weekends due to Human Resource shortages.

3.14 Risk Rating Table

The hazards can be listed from the highest to lowest priority by combining the probability and impacts to determine the risk rating from the following table.

Risk Rating Table

Impact Rating \ Probability Rating	A Highly Likely	B Likely	C Possible	D Unlikely
1 - Catastrophic	A1	B1	C1	D1
2 - Critical	A2	B2	C2	D2
3 - Serious	A3	B3	C3	D3
4 - Marginal	A4	B4	C4	D4

High  Moderate  Low  Very Low 

4.0 ARHA REGIONAL HAZARD RISKS

Hazard Type and Description	Historical Data	Possible Hazard Impacts	Probability	Impact	Risk Rating
Summer Storms					
Severe Storm	Annually	3.4 Storms 3.9 Fire 3.13 Factors	A	3	Moderate
Strong Winds		3.4 3.11 3.13	B	3	Moderate
Tornado (F3 or less as. Region not susceptible to F4 and F5 tornados)	Birtle (1994) Foxwarren (2005)	3.2 3.11 3.13	C	3	Moderate
Winter Hazards					
Extreme Cold (Defined as minus 35 C with windchill or minus 50C if no windchill)	Annually	3.5 3.11 3.13	A	3	Moderate
Blizzard (Winds 40+km/hr, visibility decreased to 1 km or less, windchill for temp lower than minus 25 and conditions last more than 4 and less than 24 hours)	Annually	3.5 3.7 3.13	A	3	Moderate
Ice Storm		3.5 3.7 3.11 3.13	B	2	High
Flooding					
River Flooding	2004/2005 Assiniboine & Souris Rivers	3.3 3.11 3.13	A	3	Moderate
Overland flooding		3.3 3.11 3.13	A	3	Moderate
Biological					
Epidemic (Pandemic)	1918 1957	3.1 3.10 3.11	B	1	High
Water Contamination (Ecoli, Crypto, etc)	Ecoli 2002	3.1 3.10 3.13	B	2	High

Encephalitis (West Nile Virus)		3.1 3.10 3.13	A	3	Moderate
Agriculture Disease					
Wildfire					
Urban Interface		3.6 3.11 3.13	D	2	Low
Smoke (forest, stubble, grass fire)		3.6 3.13	B	3	Moderate
Fire					
Own Facility (requiring evacuation of facility)		3.9 3.11 3.13	C	1	Moderate
Neighboring building		3.9 3.11 3.13	C	3	Moderate
Dangerous Goods					
Fixed Site Incident: facility or pipeline-spill, fire or explosion)	Rapid City Brookdale	3.8 3.9 3.11 3.13	B	1	High
Non-fixed incident: Road		3.7 3.8 3.13	B	3	Moderate
Non-fixed Incident: Rail and Plane		3.7 3.8 3.13	B	3	Moderate
Utility Disruption					
Power outage (greater than 6 hours)	2004 2005	3.11 3.13	A	3	Moderate
Communication Disruption	2004 2005	3.11 3.13	A	3	Moderate
Major Water Main Break		3.1 3.11 3.13	C	3	Moderate
Social Unrest					
Terrorism		3.1 3.8 3.10 3.11 3.12 3.13	C	1	Moderate

Civil Unrest (riots, etc)		3.10 3.11	C	3	Moderate
Labour Disruption		3.13	C	3	Moderate
Transportation Accident (No Hazmat)					
Plane Crash		3.7 3.13	C	3	Moderate
Train Derailment		3.13 3.17	C	3	Moderate
Road Accident (Multiple vehicle, bus)	Annually	3.7 3.13	A	2	High
Secondary Impacts					
Multiple Casualties	Annually	3.7 3.13	A	2	High
Power Outage	2004 & 2005		A	2	High
Transportation Disruption	Annually	3.7 3.13	B	3	Moderate
Supply Chain Disruption		3.13	B	3	Moderate
Communication Disruption			A	3	Moderate
Reception of Evacuees		3.13	D	3	Very Low
Staff Availability		3.13	C	2	Moderate
Generator failure			C	2	Moderate
HVAC failure			C	2	Moderate
Drought					

5.0 Prioritized List of Hazards

Initial Hazards	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
<i>HIGH</i>								
Ice Storm	3.5 3.7 3.11	Likely	Anywhere	12-24 hours	Spring, Winter	1-12 hours warning	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Pandemic	3.1 3.7 3.10 3.11 3.13	Likely	Anywhere	8 week waves	Any season	12- 24 hours	MOH – 3 months	Multiple fatalities, staff availability, transportation/supply chain/communication disruption
Water Contamination	3.1 3.3 3.10 3.13	Likely	Anywhere	Greater than 4 days	Any season, any time	No warning	Public Health MOH	Multiple casualties, staff availability, transportation/supply chain/communication disruption.
Dangerous Goods – Fixed Site	3.7 3.8 3.9 3.10 3.13	Likely/Possible	Any facility	1-30 days	Any season, any time	No warning	No available warnings	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Non-Fixed Road Accident	3.7 3.8 3.9 3.10 3.13	Highly Likely	Anywhere	1-4 days	Any season, any time	No warning	No warning system	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Multiple Casualties	3.7 3.8 3.9 3.10 3.11 3.12 3.13	Highly Likely	Anywhere	12-24 hours	Any season, any time	No Warning	9-1-1 Police/Fire	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Power Outage – greater than 6 hours	3.7 3.10 3.11 3.13	Likely/Possible	Anywhere	1-24 hours	Any season, any time	No warning	No warning system	Staff availability, transportation/supply chain/communication disruption. Evacuation

MODERATE	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
Severe Summer Storm	3.2 3.4 3.7 3.11 3.13	Possible	Anywhere	12-24 hours	Spring, summer anytime	12 – 24 hours	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Strong Winds	3.4 3.7 3.9 3.11 3.13	Likely	Anywhere	12 – 24 hours	Any season, anytime	12 – 24 hours	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Tornado	3.2 3.4 3.7 3.8 3.9 3.11 3.13	Likely	Anywhere	1 minute – 1 hour	Summer, Fall	No warning	Police Environment Canada	Injuries, power and communication disruption
Extreme Cold	3.5 3.7 3.10 3.11 3.13	Highly likely	Anywhere	1- 4 days	Winter at anytime	12-24 hours	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Blizzard	3.5 3.7 3.10 3.11 3.13	Likely	Anywhere	12-24 hours Cleanup 1-4 days	Any season other than summer	1-12 hours warning	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
River Flooding	3.1 3.3 3.7 3.10 3.11 3.13	Possible	Anywhere along river	1-4 days	Spring/summer	1 -12 hours warning	Manitoba Conservation (Natural Resources)	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Overland Flooding	3.3 3.4 3.11	Possible	Anywhere along river	Greater than 4 days	Spring, summer, winter	No warning	Environment Canada	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Encephalitis	3.1 3.7 3.10 3.11 3.13	Possible	Anywhere		Summer, anytime	More than 24 hours warning	MOH, Public Health, CDC	Staff availability

MODERATE CONTINUED	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
Wildfire – Smoke	3.4 3.6 3.7 3.8 3.9 3.10 to 3.13	Possible	Anywhere	Greater than 4 days	Summer, Fall anytime	1- 12 hours warning	Environment Canada	Staff availability Evacuation
Fire – Own Facility	3.4 3.6 to 3.13	Possible	Any Facility	Extended	Any season, anytime	No warning	Smoke Detectors	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Fire – Neighboring Building	3.4 3.6 to 3.13	Likely	Any facility with close proximity to other buildings	1-4 days	Any season, anytime	1 minute – 1 hour	Police/Fire Officials	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Dangerous Goods Non-Fixed – Road	3.7 to 3.13	Likely	Anywhere, anytime	Extended	Any season, anytime	No warning	Police/Fire Officials	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Dangerous Goods Non-Fixed – Rail	3.7 to 3.13	Likely	Anywhere, anytime	Extended	Any season, anytime	No warning	Police/Fire Officials	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Dangerous Goods - Internal	3.7 to 3.13	Possible	Anywhere, anytime	Extended	Any season, anytime	No warning	Code at Facility	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Major Gas Main Break	3.7 to 3.13	Possible	Anywhere	Extended	Any season, anytime	No warning	Police/Fire Officials	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Major Water Main Break	3.1 3.7 to 3.13	Highly Likely	Anywhere	1-4 days	Any season, anytime	No warning	No warning system	Injuries, power outages, multiple casualties, staff avail., transportation/supply chain/communication disruption.

MODERATE CONTINUED	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
Terrorism	3.1 3.7 to 3.13	Possible	Anywhere	1-4 days	Any season/day	No warning	Police, Army	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Civil Unrest	3.10	Possible	Anywhere	1-4 days	Any season, anytime	No warning or less than 1 hour	Police	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Staff Availability	3.1 3.13	Possible	Anywhere	1-4+ days	Any season, anytime	1-12 hours	CDC Human Resources	Ability to provide service and care, evacuation of facility if no staff to care for patients and reception of evacuees if patients transferred to facility in Region.
Labour Disruption	3.1 to 3.12	Possible	Anywhere and affecting multiple facilities	Greater than 4 days	Any season, anytime	More than 24 hours warning	Labour Relations Officer, Human Resources	Staff availability, service disruption(limited OR), transport and supply chain disruption, reception of evacuees if facility cannot provide service.
Plane Crash	3.2 3.4 3.6 to 3.12	Possible	Anywhere	1-12 hours	Any season, anytime	No warning	No warning	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Train Derailment	3.1 3.5 3.7 to 3.13	Likely	Any area with rail access	12-24 hours	As per train schedules	No warning	No warning system	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Transportation Disruption	3.1 to 3.13	Likely	Anywhere but more likely in communitie s with less options regarding transportatio n	Greater than 4 days.	Any season, anytime	1-12 hours warning	Transport Canada, Police	Staff availability, service disruption(limited OR), transport and supply chain disruption, reception of evacuees if facility cannot provide service.

MODERATE CONTINUED	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
Supply Chain Disruption	3.1 to 3.13	Likely	Anywhere and affecting multiple facilities	Greater than 4 days	Any season, anytime	More than 24 hours notice	Suppliers, Transport Canada	Unable to provide service or care, staff availability(if staff become ill due to lack of isolation supplies)
Communicatio n Disruption	3.2 to 3.13	Highly likely	Anywhere	12-24 hours	Any season, anytime	No warning	No warning system	Supply chain disruption, staff availability

LOW	Merged hazards	Frequency of Occurrence	Location	Duration	Time Patterns	Speed of Onset	Available Warnings	Consequences
Wildfire – Urban Interface	3.1 to 3.13	Possible	Anywhere and may impact multiple locations	Greater than 4 days	Summer and Fall	No Warning	Manitoba Conservation (Natural Resources)	Injuries, power outages, multiple casualties, staff availability, transportation/supply chain/communication disruption.
Very Low								
Reception of Evacuees	3.1 3.2 3.3 3.6 3.8 to 3.11	Unlikely	Anywhere	1-4 days	Any season, anytime	1-12 hours	Police/Fire Officials MB Health	Availability of staff, increased use of resources so supply chain may not meet demand.
Agricultural Disease	3.1 3.3 3.4 3.8 3.11	Possible	Anywhere	Extended	Any season, anytime	Spring, summer, fall	Agriculture Canada, MOH, Public Health	Illness/death Availability of staff, increased use of resources so supply chain may not meet demand.
Drought	3.6 3.8 3.10	Likely	Anywhere	Extended	Summer	More than 24 hours	Manitoba Conservation (Natural Resources)	Prolonged recovery time
TBA								

6.0 VULNERABILITY TO SPECIFIC HAZARDS

6.1 Non RHA Vulnerable Hazards

	Facilities	Populations	Essential Services	Infrastructure	Hazmat production/ storage facilities
HAZARD					
Summer Storms					
Severe Storm (lightning, hail, heavy rain)	-All buildings in Region at risk.	-All individuals have minor risk (hit by lightening)	-Debris may block access. -peronnel at risk during storm	-Overload of systems -Damage to power lines, communication -Damage to roads	-Outdoor chemical storage – damage to building.
Strong Winds	-Loss of roofs -Fallen trees can damage buildings	-Risk to individuals – building collapse -Injuries to individuals	-Conditions to respond – flying debris -Debris blocking access	-Damage to power lines, communication -Damage to roads	-Outdoor chemical storage – damage to building.
Tornado (F3 or less)	-Damage any building	-Risk to individuals – flying objects -Potential damage to individuals in vehicles	-Increased resources needed to respond. -Risk to individuals responding.	-Damage to buildings, water plant, power lines, communication.	-Impact with truck, trains carrying hazmat.
Winter Hazards					
Extreme Cold	-Damage to water pipes. -Delivery of service	-Hypothermia indoors and outdoors -Increased financial burden with heating costs. -Increased viral infections – from indoor activities	-Extreme working conditions -Increased risk of fires – with alternate heat sources and wood stoves	-Water main breaks -Equipment failure -Risk of power lines breaking due to extended cold.	-Integrity of storage containers by cold temperatures- risk of hazardous material leakage.
Blizzard		-Increased rate of injury secondary to activities outside. -Risk of hypothermia -Vulnerable persons without food, medication -Movement of people for medical care impossible.	-Decreased number of personnel available to respond. -Risk of injury with travel to respond.	-Roads closed secondary to snow clearing not possible.	-Little to no risk with outdoor storage of chemicals.
Ice Storm	-Collapse of structures due to weight of ice.	-Increase of injuries due to falls and motor vehicle accidents. -Movement of people for medical care impossible.	-Risk of injury traveling to respond to emergency situations.	-Downed power and communications lines. -Roads closed secondary to icy conditions.	-Little to no risk with outdoor storage of chemicals.
Flooding					
River Flooding	-Damage to buildings -Mould associated with flooded buildings	-Loss of life due to drowning -Drinking water supply contaminated -Mental anguish -Injuries with sandbagging, moving furniture. -Evacuees	-Risk of rescuing trapped individuals -Travel to scene may be difficult due to road closures	-Loss of roads, bridges -Sewer system overload	-Flooding of areas where hazardous materials are kept
Overland Flooding		-Loss of income if businesses impacted -Evacuees	-Travel to scene may be difficult due to road closures -Increased workload monitoring abandoned property	-Loss of transportation routes (road, rail)	-Flooding of areas where hazardous materials are kept.

Biological					
Epidemic (pandemic)	-Illness/death of workers who maintain homes and facilities	-Loss of life and income of families if family members ill/deceased. -Increased need for mental health secondary to fear and anxiety	-Decrease in numbers of workers due to illness of workers -Increased risk of illness secondary to contact with people/animals. -Training needs for special needs of clients -Lack of supplies -Increased workload due to staffing shortages -Additional stress in workers.	-Lack of workers to maintain infrastructure -	N/A
Water Contamination	-Schools and public buildings without functioning water/sanitation	-Illness/death related to consumption of contaminated water -increased need for mental health services -Increased workload due to securing adequate water supply	-Increase workload due to assistance in distributing potable water. -Investigation of contamination -Increased workload associated with care of victims.	-Contaminated water requires system to be flushed and monitored. -Security needs of water treatment facilities.	-Ensure cause of contamination is not due to Haz Mat.
Encephalitis (West Nile)	-N/A	-Illness/death related to outbreak	-Increased workload due to increase in clients	-N/A	-N/A
Agricultural Disease	-N/A	-Individual cases -Increase need for mental health due to anxiety and fear.	-Increased workload due to increase in clients.	-N/A	-Appropriate disposal of animals/product.
Wildfire					
Urban Interface	-Loss of public buildings	-Loss of income, life. -Evacuees -Increased need for mental health due to anxiety and fear	-Increased workload if individuals need to be relocated or due to injuries -Loss of life/capacity if workers are injured. -Loss of services (Police/Fire).	-Loss of equipment needed to maintain infrastructure -Loss of workers needed to maintain equipment/buildings -Loss of infrastructure, prolonged time to rebuild	-Heat/fire may cause explosion of stored chemicals.
Smoke	-Loss of HVAC at facilities	-Increased risk to people with respiratory problems -Loss of employment for outdoor workers -Relocation of people in affected areas. -Increased need for mental health services due to fear, anxiety.	-Increase in respiratory conditions -Increase in workload if conditions impact community.	-Smoke fire damage to infrastructure.	N/A
Fire					
Own Facility	-Relocation of hospital patients compromises community capacity.	-Evacuation to another community -Reduction in health care services -Loss of family/friends if fire in hospital/clinic.	-Injuries/death of workers that respond to fire. -Stress to workers	-Loss of, or change to essential services.	-Fire/explosion may affect the stability of internal hazardous materials

Neighboring Building	-Loss/damage of a facility	-Loss of family/friends due to injuries from fire -Loss of employment	-Injuries/death of workers responding to fire -Stress to workers	-Damage to equipment used to maintain facility -Damage to infrastructure in close proximity to fire	-Fire/explosion may affect the stability of internal hazardous materials
Dangerous Goods					
Fixed Site Incident: Facility or Pipeline	-Loss or damage of a facility	-Loss/Injury of family/friends as a result of incident -Mental health issues -Evacuation	-Injuries/death of workers responding to incident	-Damage or no access to infrastructure in area of incident	-HazMat
Non-fixed Incident: Road	-Loss of access to or damage to facilities near site of incident	-Loss/Injury of family/friends as a result of incident -Mental health issues -Evacuation	-Injuries/death of workers responding to fire -Stress to workers	-Loss of access or damage to road and surrounding infrastructure	-HazMat
Non Fixed Incident : Rail	-Loss of access to or damage to facilities near site of incident	-Loss/Injury of family/friends as a result of incident -Mental health issues -Evacuation	-Injuries/death of workers responding to fire -Stress to workers	-Loss of access or damage to road and surrounding infrastructure	HazMat
Utility Disruption					
Power Outage	-Facilities without heat/power -Fire alarm failures if there is no backup power source	-Hypothermia if no heat -Loss of supply of food/water -Loss of income if businesses closed -Lost time from school activities	-Difficult working conditions -Failure of communication	-Loss of communication – water delivery -Need to maintain systems by back up power supply.	-N/A
Communication Disruption	-Facilities without phones	-Limited access to emergency services -Loss of income – business (email/phones)	-Routine work not possible -Decrease effectiveness – slow response time	-Communication part of infrastructure	-N/A
Major Water Main Break	-Facilities without water	-No potable water -Loss of income – businesses closed	-Effect on firefighting services -Increased workload to supply water	-Damage to roads/sewer systems from runoff	-Hazmat materials may need to be relocated if at risk
Social Unrest					
Terrorism	-All Facilities are potential targets.	-Multiple casualties -Increased need for mental health services. -Loss of income -Variation in normal routines.	-Illness/death of workers. -Increased workload to responders -Lack of training and equipment. -Post traumatic stress .	-Damage to infrastructure	-May be used in attacks.
Civil Unrest	-All Facilities are potential targets.	-All populations may be affected.	-Illness/death of workers -Increased workload to responders. -Lack of training and equipment. -Post traumatic stress	-Damage to infrastructure.	-May be used in attacks.
Labour Disruption	-Closure of facilities during strike action.	-All populations may be affected. -Change in services.	-Increased workload	-Lack of workers to maintain infrastructure.	-Security of materials may be compromised.

Transportation Accident (No Haz-Mat)					
Plane Crash	-Plane may impact with one or more communities.	-Multiple casualties/deaths. -Increased need for mental health services. -Loss of income if business destroyed. -Air transport of injured may be disrupted.	-Illness/death of workers. -Increased workloads of responders. -Lack of training and equipment. -Post traumatic stress.	-Damage to power and communication lines -Road closure if impact on road	-Plane impacting with hazardous materials stored at site..
Train Derailment	-Train impacting with facility close to tracks.	-Multiple casualties/deaths. -Increased need for mental health services -Loss of income	-Illness/death of workers. -Increased workloads of responders. -Lack of training and equipment. -Post traumatic stress	-Damage to infrastructure in vicinity of derailment. -Loss of railway	-None unless materials stored at site.
Road Accident	-Damage to facility if vehicle impacts it.	-Multiple casualties/deaths. -Increased need for mental health services	-Increased workloads for responders. \	-Damage to power and communication. -Road closures	N/A

6.2 RHA Vulnerable Hazards

HAZARD	Vulnerable Facilities	Vulnerable Services	RHA Planning Issues
Summer Storms			
Severe Storm (lightning, hail, heavy rain)	-Facilities and clinics may lose power, be at risk for fire and possibly flood. -May have to be relocated to refuge site.	-Operating Room, Acute Care, Emergency Care if loss of power or damage to facilities.	-Equipment power source – generator -Access to information – Scheduling, emails, medical records. -Evacuation (if necessary) -Alternative sites to deliver health care in the event of loss/damage to facility -Available stockpile of supplies/equipment.
Strong Winds	-Roof damage to facility. -Loss of power lines		-Equipment power source – generator
Tornado (F3 or less)	-All facilities at risk of damage -Loss of staff injured in tornado	-All services may be disrupted.	-Equipment power source – generator -Access to information – Scheduling, emails, medical records. -Evacuation (if necessary) -Alternative sites to deliver health care in the event of loss/damage to facility -Available stockpile of supplies/equipment. -Ability to receive weather reports and other information from other agencies (Police, Fire) -Limited time to prepare.

Winter Hazards			
Extreme Cold	-All facilities vulnerable to increased heating costs -Facilities may be vulnerable due to ruptured pipes and water loss if town supply is interrupted.	-Travel to community may be limited due to unsafe driving conditions. -Ability of staff to attend work due to vehicles not working as a result of temperatures.	-Relief for staff who must remain at work to replace those who cannot attend -Alternative methods of transportation for staff to travel (Handivan, skidoos) -Alternative sites to deliver health care in communities. -Accommodations for staff at facility to lessen traveling.
Blizzard	-Access to building may be impacted by snowfall -Roads may be closed	-Emergency services may be impacted with road closures and access to facilities. -Staff unable to attend wor.	-Relief for staff who must remain at work to replace those who cannot attend. -Alternative methods of transportation for staff to travel (Handivan, skidoos) -Alternative sites to deliver health care in communities. -Accommodations for staff at facility to lessen traveling.
Ice Storm	-Loss of communications and power lines as lines break under the weight of the ice. -Damage to facilities if broken lines and trees impact them.	-Emergency services will be impacted if vehicles are unable to travel due to road conditions -Communication problems if there is no power and telephone. -Operating Room, Acute, Care, Emergency Care if power is lost.	-Relief for staff who must remain at work to replace those who cannot attend. -Alternative methods of transportation for staff to travel (Handivan, skidoos) -Alternative sites to deliver health care in communities. -Alternative forms of communication if telephone services unavailable. -Accommodations for staff at facility to lessen traveling.
Flooding			
River Flooding	-Facilities close to rivers at risk -Disruption in utility services are possible	-Emergency Services impacted if vehicles are unable to travel due to road conditions. -Evacuation of some facilities if floodwaters damage facility or put lives at risk.	-Emergency transport of staff from homes to facility (boats). -Ensure the safety of medical records. -Alternative sites to deliver health care -Alternative forms of communication if telephone services unavailable. -Water/sewer? -Ability to receive information in timely manner.
Overland Flooding	-Risk of damage to facilities in affected areas.	-Emergency services impacted if vehicles unable to travel due to road conditions. -Evacuation of some facilities if clients and staff at risk.	- Emergency transport of staff from homes to facility (boats). -Ensure the safety of medical records. -Alternative forms of communication if telephone services unavailable. -Alternative sites to deliver health care -Water/sewer? -Ability to receive information in timely manner.

Biological			
Epidemic (Pandemic)	-Facilities closed or reduced services due to lack of staff	-All services vulnerable.	-Alternatives in human resource staffing if staff ill or deceased. -Obtaining needed supplies or personal protective equipment -Training of staff/volunteers in care and treatment of ill -Securing supplies of needed medication and equipment. -Managing response to increased workloads – essential service provisions. -Enhanced security to restrict visitor access. -Obtaining and sharing information in a timely manner with other agencies and the general public.
Water Contamination	-All facilities may be impacted. The facility may not close but lack of water or lack of safe water may impact the facility.	-All patients/staff vulnerable until such time as a safe water supply is made available. -Alternative methods to clean equipment and to ensure proper personal hygiene. -Reduction in OR and acute services.	-Securing potable water supply -Securing sanitation facilities. -Additional staff needed to manage increased workload due to epidemics related to water borne disease. -Increased workload for public health. -Communication with outside agencies and MOH.
Encephalitis (West Nile)	-All facilities may be impacted by increased patient load.	-Staff may become infected and unable to attend work.	-Additional staff may be needed to manage increased workload. -Increased workload for public health. -Communication with outside agencies and MOH.
Agricultural Disease	-Facilities may be impacted.	Acute services vulnerable, due to increase in patients.	Increased workload in public health if any outbreak occurs. Rabies, Mad Cow, TB
Wildfire			
Urban Interface	All facilities at risk but the risk is minimal. -Facilities may be damaged or destroyed.	-All services vulnerable. -Services impacted if staff delivering services are injured/deceased.	-Alternative in human resource staffing if staff ill/deceased or evacuate community. -Managing response to workload changes. -Alternative sites to deliver health care services. -Evacuation -Support staff who remain in community to provide assistance to emergency services. -Access to information (payroll/medical records)
Smoke	-All facilities at risk. -May be required to Shelter in Place	-Services may be impacted if staff delivering services are ill or need to prioritize care. -Asthmatics may be extremely susceptible to smoke associated breathing disorders.	-Alternative in human resource staffing if staff ill/deceased or evacuate community. -Managing response to workload changes. -Alternative sites to deliver health care services. -Evacuation -Support staff who remain in community to provide assistance to emergency services.

Fire			
Own Facility	-All facilities at risk but risk unlikely to affect all facilities at once. -Facilities may be damaged/destroyed.	-All services vulnerable. -Services would be impacted if staff delivering services were injured/killed.	-Fire protection in facilities. -Regular fire inspections -Back up for records -Alternative site for health care service delivery. -Alternatives in human resource staffing if staff is injured/killed. -Alternatives in communication -Evacuation -Transportation of clients and staff to alternative site. -Long term relocation for delivery of services.
Neighboring Building	-Risk greater in smaller communities due to proximity of buildings.	-All services if evacuation of health facility is necessary due to impending spread of fire or hazmat. -Access to services may be impacted by activities of Fire/Police. -Poor air quality	-Alternative sites to deliver health care in the event of damage/destruction of facility. -Alternatives in human resource staffing if staff is injured/killed. -Alternatives in communication -Evacuation -Transportation of clients and staff to alternative site. -Establish alternate access entry points to avoid closure of facilities.
Dangerous Goods			
Fixed Site Incident: facility or pipeline	-Any facility that stores hazardous goods. They may also be stored in vehicles in parking lot.	-All services if evacuation of health facility needed because of risk secondary to hazardous materials.	-Need to shelter in place or evacuate. -Transportation options to move evacuated patients and staff. -Establish alternate access entry points to avoid closure of facilities. -Obtain needed supplies of personal protective equipment. -Training of staff/volunteers in use of PPE. -Identify & contact agencies to remove dangerous goods. -Increased workload if multiple victims in accident. -Communication with outside agencies.
Non Fixed Incident: Road	-Accidents may lead to water contamination if spill occurs in a water source. -Accidents may lead to road closure. -Accident close to facility may lead to facility evacuation.	-All services if evacuation of facility is required. -Supply chain may be interrupted, but should only be short term.	-May need to evacuate acute facilities. -Facility shut down. -Transportation options to move patients and staff. -Obtaining needed supplies of PPE. -Training of staff/volunteers in PPE. -Increased workload if multiple victims of accident. -Communication with outside agencies.
Non Fixed Incident :Rail	-Accidents may lead to water contamination if spill occurs in a water source. -Accidents may lead to road closure. -Accident close to facility may lead to facility evacuation.	-All services if evacuation of facility is required.	-May need to evacuate acute facilities. -Facility shut down. -Transportation options to move patients and staff. -Obtaining needed supplies of PPE. -Training of staff/volunteers in PPE. -Increased workload if multiple victims of accident. -Communication with outside agencies.

Utility Disruption			
Power Disruption	-All facilities may be affected individually or at the same time	-All services may be affected if backup power supply does not exist.	-Equipment power source (generators) -May need to evacuate acute facilities. -Facility shut down. -Transportation options to move patients and staff. -Communication failure – alternate forms of communication. -Alternate sites to deliver health care services. -Regular testing of backup power sources. -Availability of emergency supplies (heat source, blankets, flashlights)
Communication Disruption	-All facilities at risk.	-Community programs may be impacted if phone lines are lost. -Emergency systems may be down (paging systems) -Access to patient information pertaining to patient care may not be received if information is normally relayed by email, fax, phone.	-Communication failure with major centres that are relied upon for phone consults. -Alternate communication systems (satellite phones) -Information Technology contingency plan for computer networks.
Major Water Main break	-All facilities may be affected but likely only one facility per incident	-Services dependent on sewage and potable water supply. (OR, acute care) -Flooding in basements a possibility.	-Alternative sources of potable water. -Loss of records and equipment if flooding occurs.

Social Unrest			
Terrorism	-Any facility could be targeted.	-Ability to transport ill patients may be affected. -Supply chain may be affected. -All services may be affected if staff injured/killed.	-Alternatives in human resource staffing if staff injured/killed. -Alternative sites to deliver health care in event of destruction/damage to facility. -Alternatives in communication if service interrupted. -Need to evacuate acute patients. -Transportation options to move evacuated patients/staff. -Obtaining and sharing information with outside agencies. -Security needs -Increased workload if mass casualties.
Civil Unrest	-Any facility could be targeted.	-Ability to transport ill patients may be affected. -Supply chain may be affected. -All services may be affected if staff injured/killed.	-Alternatives in human resource staffing if staff injured/killed. -Alternative sites to deliver health care in event of destruction/damage to facility. -Alternatives in communication if service interrupted. -Need to evacuate acute patients. -Transportation options to move evacuated patients/staff. -Obtaining and sharing information with outside agencies. -Security needs -Increased workload if mass casualties.
Labor disruption	-Any facility could be targeted.	-Ability to transport ill patients may be affected. -Supply chain may be affected. -All services may be affected dependent upon the establishment of an essential services agreement.	-Alternatives in human resource staffing. -Need to relocate acute patients. -Transportation options to move evacuated patients/staff in the event care standards cannot be maintained at a basic level. -Obtaining and sharing information with outside agencies. -Security needs

Transportation Accident (No HazMat)			
Plane Crash	-Potential for impact with any facility	-Service provision impacted if staff or their family injured/killed. -Apply to access Life flight.	-Increased workload if mass casualties. -Alternatives in human resource staffing if staff injured/killed. -Alternative site to deliver health care in the event of the destruction/damage of facility. -Alternatives in communication if utility disruption. -Communication with outside agencies.
Train Derailment	-Any facility could be impacted if they are located within close proximity to rail line.	-Service provision impacted if staff injured/killed. -Damage to facility infrastructure -Access to facility	-Increase in workload if mass casualties. -Alternatives in human resource staffing if staff injured/killed. -Alternative site to deliver health care in the event of the destruction/damage of facility. -Alternatives in communication if utility disruption. -Communication with outside agencies.
Road Accident (multiple vehicle, bus)	-Any facility may be impacted.	- Service provision impacted if staff injured/killed. -Damage to facility infrastructure -Access to facility	-Increase in workload if mass casualties. -Alternatives in human resource staffing if staff injured/killed. -Alternative site to deliver health care in the event of the destruction/damage of facility. -Alternatives in communication if utility disruption. -Communication with outside agencies.

7.0 Resources

7.1 ARHA Disaster Plan

8.0 Scenarios

8.1 ARHA Disaster Plan - Exercises

