

DISASTER MANAGEMENT MODEL FOR THE HEALTH SECTOR

Guideline for Program Development

Manitoba Health
Disaster Management

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2000

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Introduction

Manitoba Health, through its programs and its Disaster Management Branch, aims to develop safer communities that suffer fewer deaths, physical injuries and psycho-social trauma as a result of disasters. To achieve this the health system must be capable of providing a coordinated response during disasters and deliver effective mitigation and preparedness programs before an impact. The health sector has a vested interest and a key role in this process since safer communities are healthier and the health of the population is an important contributing factor to individual and community safety.

Manitoba Health has developed six disaster management expected outcomes that describe the long-term desired state of disaster management in the health sector. These outcomes will be achieved by implementing a comprehensive, integrated program based on the principles of disaster management. A successful disaster management program will incorporate the four main elements of hazard assessment, risk management, mitigation and preparedness. These will be achieved as part of an overall strategic plan for disaster management and will be included in an ongoing quality improvement cycle.

This guideline provides information about the disaster management principles and the elements that are the basis of disaster management model for the health sector. It provides an overview of the elements that will be useful when developing a strategic plan for a disaster management program in the health sector. Each element begins with proposed objectives, focused internally and externally, that may be adopted to help guide the program.

This guideline is directed at all components of the health sector. Only the scale of the activities needs to change for the principles, outcomes and elements to be applied effectively to an individual facility, a community-based program, a private sector component such as a pharmacy, a Regional Health Authority, and to the province as a whole. A coordinated program that includes all of these components will be necessary to create safer communities.

Disaster Management Outcomes

Manitoba Health has defined a set of outcomes that a successful disaster management program will aim to achieve. These specific disaster management outcomes contribute to Manitoba Health's mission to "promote, preserve and protect the health of Manitobans".

1. Manitobans live in safer communities that suffer fewer deaths, physical injuries and psychosocial trauma as a result of disasters.

This is the overall aim of a disaster management program. While large, disaster-scale impacts will continue to kill and injure people it is important to recognize that these effects can be reduced and that communities can be ready to respond and recover quickly and effectively.

2. Manitoba communities' and individuals' disaster vulnerability is minimized.

This outcome relates to the first phase of comprehensive emergency management: mitigation. The factors that place people at risk and limit their ability to cope can be changed to make the population less vulnerable to disasters, even preventing them or reducing their likelihood.

3. Manitoba communities and individuals are resilient to the impacts of disaster.

Preparing coping resources, at both individual and community levels, ensures that the harmful effects of a disaster-scale impact are limited.

4. Manitobans receive appropriate health care services in times of disaster.

A disaster impact will drastically change the health needs of a community and the ability of the health sector to meet those needs. It is important that the health care services are able to respond to the community's needs during and immediately after a disaster.

5. Manitobans receive health care services that address their changing needs resulting from a disaster.

Disasters can change the future of individuals and whole communities. The direct effects of injuries sustained in a disaster can require long-term rehabilitation while the indirect impacts on the social, economic and physical environment can affect the population's health overall. The health sector must recognize and adapt to these changing needs.

6. Manitoba's health care system is capable of responding to disasters in other Canadian jurisdictions.

Disasters, by definition, are events that exceed the ability of the local community to cope with the harmful effects and require extraordinary measures. During National Emergencies these measures may include health care being delivered across normal boundaries.

Disaster Management Principles

Manitoba Health is committed to comprehensive emergency management, enabling the health sector to mitigate, prepare for, respond to, and recover from mass emergencies and disasters. Manitoba Health, through its Disaster Management branch, has commenced an all-hazards, all agencies program that promotes hazard reduction, emergency readiness, response co-ordination and community recovery.

Manitoba Health has adopted the following principles that guide its efforts in disaster management:

1. **Comprehensive emergency management** involves addressing hazards and disasters through a balance of mitigation, preparedness, response, and recovery activities.
2. An **integrated disaster management framework** provides an objective and logical process to achieving comprehensive emergency management through normal systems.
3. An **all-hazards approach** examines the full range of threats and recognizes the common consequences of different impacts.
4. A systematic **risk management approach** provides a framework for determining the appropriate risk treatment options.
5. **Business continuity planning** ensures that services remain available at appropriate levels in times of internal disruption.
6. **Ongoing monitoring and evaluation** are necessary because communities, the threats they face, and the systems they develop are part of a dynamic interaction.
7. **Cooperation and coordination** with municipal governments, provincial departments and other relevant agencies will ensure the health sector can contribute to and support the overall disaster management activities of the community.
8. Appropriate **technical information and expertise** must form the basis for disaster management systems, decisions and actions.

The practice of disaster management is built on these fundamental principles. They are interrelated to each other and best achieved when integrated into an organization's normal systems or business. Together with Manitoba Health's broader goals, expected outcomes and priority populations, these principles set the direction for disaster management in the health sector.

Disaster Management and Health

Vulnerability describes the relationship between common social and economic characteristics of the population, individually and collectively, and their ability to cope with hazards they face. The factors that increase an individual's vulnerability to harm in a disaster are the same

as the factors that determine the general health of an individual. Each of these can contribute to how a disaster affects an individual and therefore lessening the impacts of a disaster is dependent on improving these factors (just as improving these factors will improve an individual's health).

“Health” has been defined, in part, as the ability to cope with life's challenges. Clearly a disaster creates rare and extreme challenges but an individual's ability to cope is still the basic factor in determining how the disaster will affect them and the “determinants of health” are the basic indicators of that coping ability.

Since death and injury are the primary negative impacts of a disaster it is obvious that the health sector has a direct role in disaster management¹. Unfortunately disaster management has tended to emphasize the immediate response needs and has neglected the pre-event mitigation and post-event recovery needs of communities. The health sector has traditionally shared this limited view of disaster management and has directed its energies toward reactive measures, such as mass casualty triage plans and facility evacuation schemes.

The population health approach currently being promoted by Health Canada and Manitoba Health looks at the following factors as determinants of health:

- Income and Social Status
- Social Support Networks
- Social Environments
- Physical Environments
- Healthy Child Development
- Education Employment and Working Conditions
- Personal Health Practices and Coping Skills
- Biology and Genetic Endowment
- Health Services
- Culture
- Gender

Manitoba Health 1997
Health Canada 2000

While such response actions are very important, and deserve appropriate consideration, disaster management is now broadening its view of how to best deal with disasters. This is strongly signaled by the field's growing interest in the concepts of sustainable mitigation and “provention”. The disaster management profession is recognizing that the only way to make a significant change to a community's catastrophic risk profile is to influence the social, economic and physical factors that determine the community's exposure to those risks and its ability or cope with actual impacts

¹ “Emergency management” is the term most commonly associated with the field of dealing with extreme harmful events. Manitoba Health refers to this as “disaster management” in order to differentiate this aspect of its work from its responsibility for urgent or emergent health care that is often referred to as “emergency medicine”. Other internationally recognized terms include “emergency preparedness” and, in some jurisdictions, “civil defense”.

In parallel to this shift in disaster management, the health sector is recognizing that better health within a community cannot be achieved through the provision of health care alone. The health sector is looking to models of population health and health promotion to address the determinants of health just as disaster management has evolved from treating the harmful agent to strengthening the community's resilience to harm.

Disaster vulnerability has been related to the following factors:

- | | | | |
|-----------------------------|--|---------------------------|--------------|
| ➤ <u>social integration</u> | ➤ <u>psychological & physiological</u> | | |
| ▪ ethnicity | ▪ locus of control | ▪ life style | |
| ▪ gender | ▪ age | ▪ agility | |
| ▪ location | ▪ education | ▪ mobility | |
| ▪ status | ▪ family type | ▪ individual's perception | ▪ experience |
| ▪ wealth | | | |

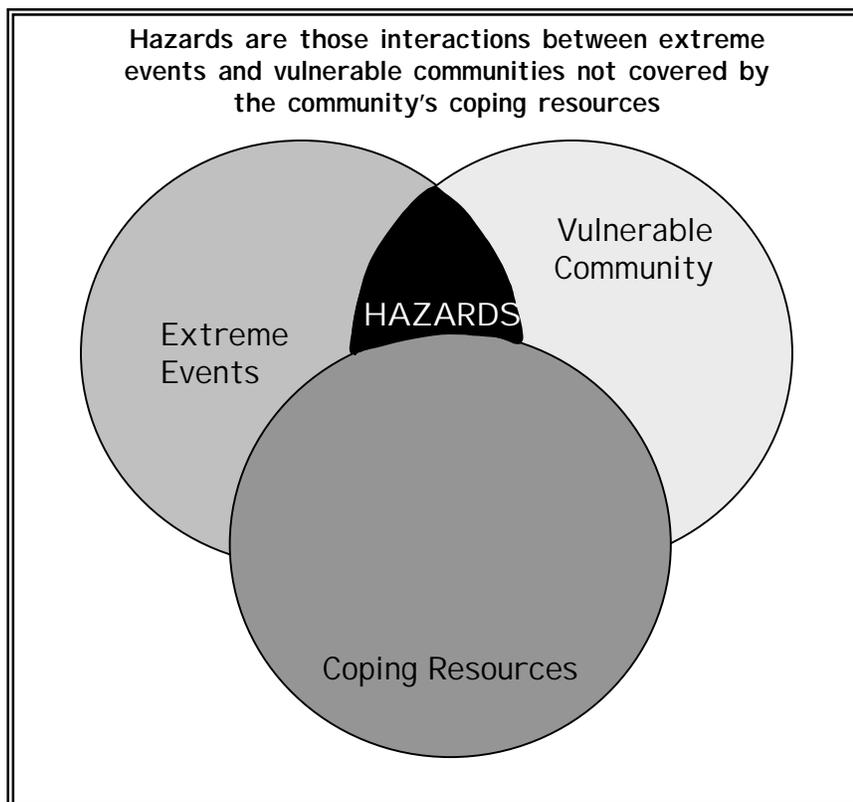
Britton and Walker 1991

Communities can become safer and healthier. The health sector must become an active partner in the disaster management of communities while disaster management becomes an integral part of a broader health program to protect, preserve and promote the health of all.

Understanding Hazards, Disasters and Disaster Management

Hazards

It is important to understand hazards before developing strategies to deal with them. This understanding must go beyond thinking of hazards just in terms of the extreme event or agent. Hazards must be considered in terms of the threat and the threatened community. For instance, a tornado, by itself, is simply an extreme weather phenomenon whereas a prairie town that is built in an area that experiences tornadoes has a tornado hazard.



This leads to thinking about hazards as a type of “interaction”. To identify what a hazard is from this perspective first consider all the extreme events in the environment that could impact on the community. Then consider how vulnerable the population is to the effects of these various impacts. Finally, consider what resources the community can apply to cope with these impacts. This recognizes that **hazards are the potential for a negative interaction between extreme events (of a natural or technological origin) and the vulnerable parts of the population.** Add to

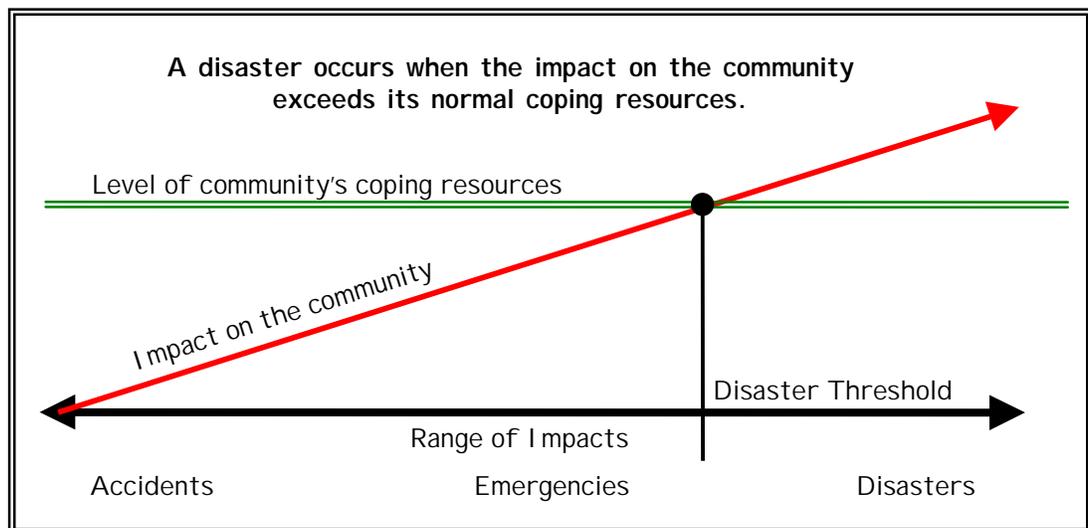
this the community’s coping resources and the hazards are the remaining potential interactions.

Different hazards have different characteristics that help explain how the interaction with the community is likely to happen. Understanding these differences can improve planning and better target mitigation activities.

Disasters

There is a range of impacts a community can experience that increase in severity along a continuous scale. At the small end of this continuum are the “everyday” accidents that effect one or two people. As the seriousness increases these mishaps become emergencies that involve more people, as victims and as responders. When an extreme event, like a tornado, occurs it can cause severe damage within the community, including property destruction and personal injuries. This type of wide-scale impact is toward the disaster end of continuum. Finding the threshold between emergencies and disasters depends on the ability of the community to deal with the event more than the cause of event itself.

Every community has some coping resources to deal with accidents and emergencies. Coping resources are the individual and community skills, materials, equipment or services that can be used to meet the demands created by an incident. The health care sector forms an important part of this, from the self-administered treatments available at a pharmacy or a walk-in clinic, through the Emergency Medical Services and hospital emergency departments, to the special care provided by burn wards or other tertiary services.



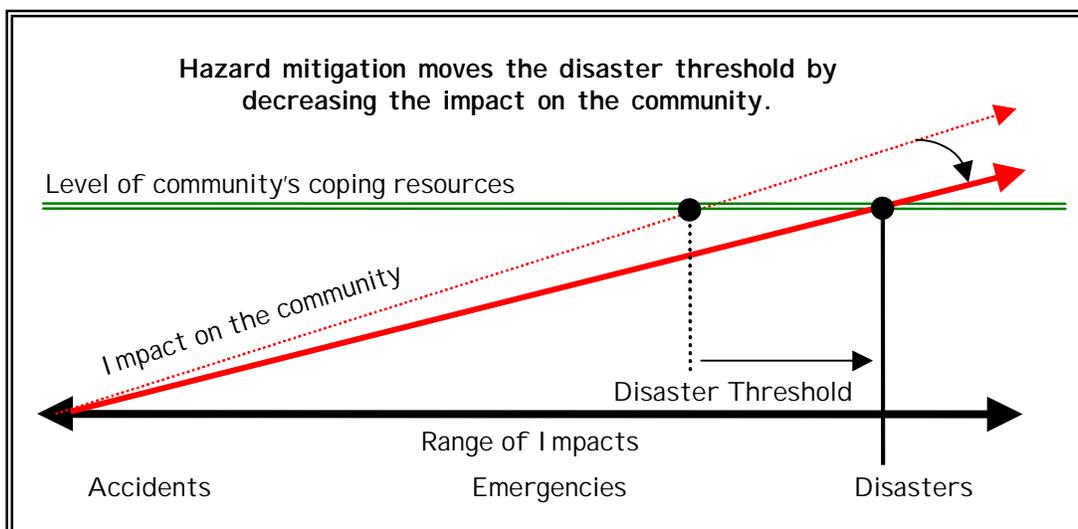
Other coping resources can include municipal departments, emergency services, private companies, volunteers and other formal or informal sources. However, these resources may be very limited and not capable of meeting all the demands created by a larger scale hazard impact. **Disasters occur when an impact exceeds the community's normal coping resources.** Disasters require communities to take extraordinary measures to apply resources effectively and to gain access to additional resources to prevent or limit further damage.

This way of understanding disasters can also mean that the same event, for instance the same depth of snowfall, may be a disaster for one community but not for another, better prepared community. It also helps explain how multiple events can combine to create a larger disaster and how factors that affect coping resources, such as holiday periods, can cause a more routine emergency to become a disaster.

Disaster Management

Disaster management aims to shift the threshold at which an impact becomes a disaster. This is achieved through two main methods: decreasing the amount of damage an impact can cause and; increasing the capability of the community's coping resources to deal with any damage that does occur. Disaster management ensures a coordinated response to make the best use of the community's coping resources. The long-term recovery of the community is also a basic part of disaster management.

Decreasing, or mitigating, the impact of an event on a community involves actions directed at the threat and actions directed at the community's vulnerability. Considering the common flood hazard as an example, dikes that prevent floodwaters from spreading are directed at the

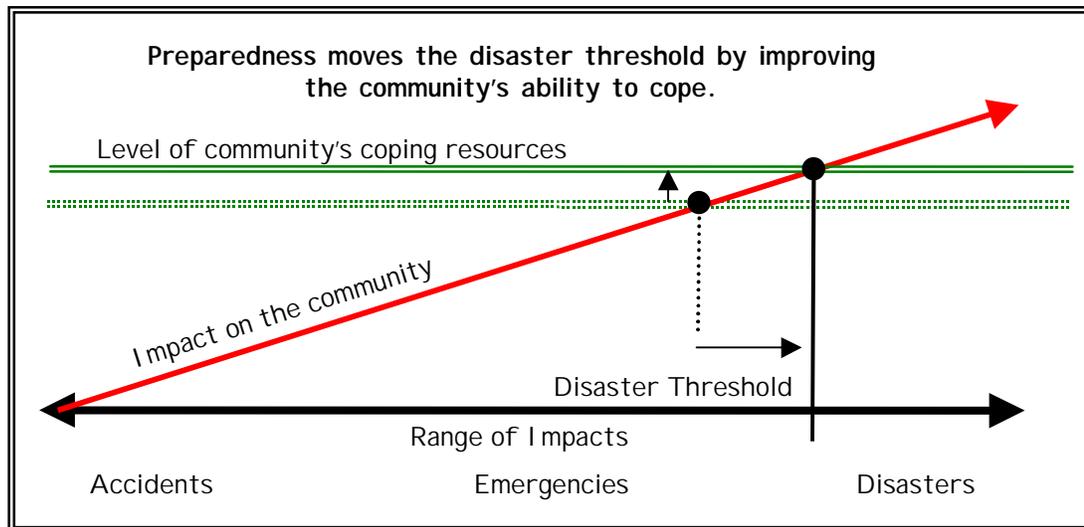


threat while land-use plans that preclude building on the flood plain are directed at the vulnerable population. These examples also highlight the difference between physical or structural mitigation activities (like dikes) and social or non-structural activities (like land-use plans).

Mitigation activities are able to shift the disaster threshold permanently so that a particular scale of event no longer presents the risk of causing a disaster. Storm sewer systems, retention ponds, and riverbank parks are all further examples of flood mitigation activities that prevent heavy rainfalls from flooding of homes. These measures are designed to compensate for an amount of rain that is determined to be large enough to cause flooding and common enough to justify the cost of the mitigation. This is the essence of risk management.

The disaster threshold is also influenced by the community's ability to cope. Communities develop resources that are appropriate to their size. Emergency response services, such as fire departments, will vary from small towns to major cities. Volunteer groups with limited equipment will be sufficient in lower risk communities and whereas fires in high-rise buildings require advanced equipment, full time professional staff and specialty units to deal with such situations. The health care system has a similar range of services based on the

community's needs. Recognizing how this level of coping ability relates to a community's disaster threshold is important when making decisions regarding resource allocation.



A comprehensive preparedness program increases the community's capacity to cope with the larger hazard impacts. Again the flood example can demonstrate this concept: sandbagging before the water rises and evacuating vulnerable populations (e.g. the elderly) allows the remaining community to cope better with the flood.

The flooding may still generate emergency response actions, perhaps fixing a ruptured dike or rescuing stranded livestock, and will certainly require clean-up and recovery. The important point is that the damage could be much worse if mitigation and preparedness actions are not taken. The whole idea of disaster management makes more sense when it is viewed as the management of the community's vulnerability, resources and environment as a means of making the community safer.

Integrated Disaster Management Model

An integrated disaster management model is a means of organizing related activities to ensure their effective implementation. Four main components can be identified:

1. Hazard assessment (identifying the threats and vulnerabilities);
2. Risk management (determining the implications and treatment options);
3. Mitigation (eliminating or reducing the threats as possible and appropriate) and;
4. Preparedness (developing and readying response and recovery actions).

These are implemented as part of a strategic approach and each link to a quality improvement process that monitors and evaluates changes to the systems, the community and the



environment. It is important to apply all six elements, as they are interdependent. While each has its boundaries and will involve its own set of processes, information and resources, they provide each other with critical support. Each of these elements can be further broken down into layers of sub-components.

An integrated disaster management framework also encourages a natural systems approach to be adopted. This approach

means that roles and responsibilities in a disaster reflect those undertaken in normal times. It prevents the development of an independent 'disaster-only' system that may be in conflict with the normal system, especially in incidents where the nature or scale of the problem does not appear sufficient or consistent enough to trigger a 'disaster' response.

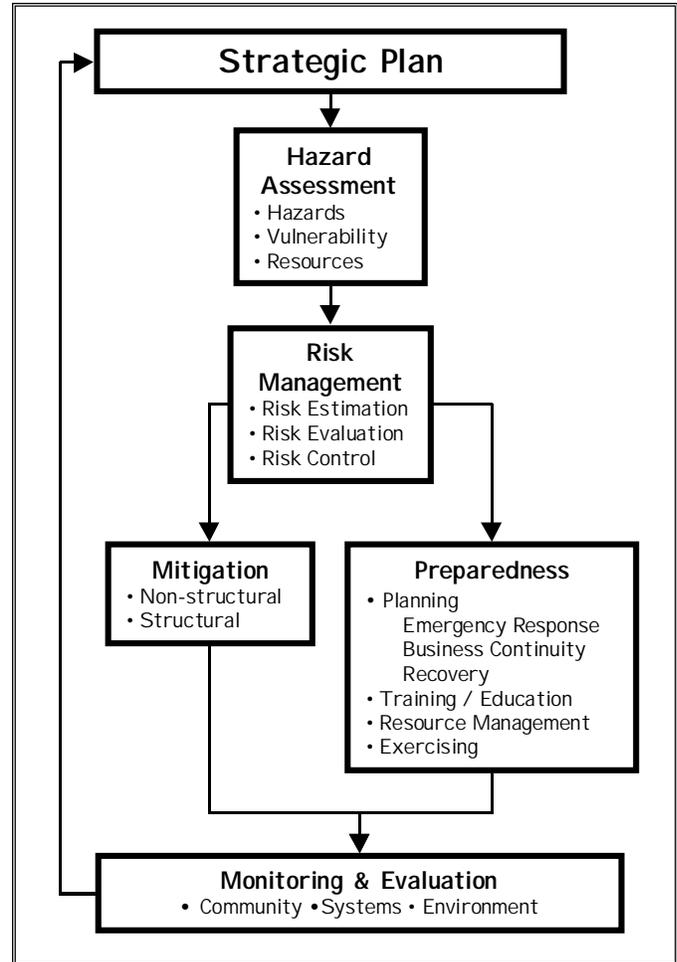
This natural system approach recognizes that ownership of disaster management planning must be linked to the day-to-day planning. In this way the responsibility for disaster management permeates an organization. The value of an integrated disaster management framework is it provides a coherent structure for how this responsibility is fulfilled within an organization.

Integrated disaster management also provides for a better balance between flexibility and preparedness. Disasters are unique events that involve a high degree of uncertainty. This requires a system that can respond fluidly to the specific demands. This adaptability must be based on pre-existing or pre-arranged activities in order to be effective. Using an integrated

framework with its preference for natural systems allows for rapid change without needing drastic realignment of roles or responsibilities.

The model is essentially a cyclical process that begins with the strategic plan that identifies the functions and assigns responsibilities for the components. The first task is hazard assessment, which provides the information necessary for the risk management step. This results in decisions on the balance of mitigation and preparedness actions needed to address the risks. All of these actions and their outcomes are evaluated through the quality improvement process that leads back to refining and maintaining the strategic overview and each component.

In practice there will be activities from all components occurring simultaneously. The whole model must be integrated into the management of the organization, whether the model is being applied by a facility, across a Regional Health Authority, or to the health sector. Different people and programs will contribute as information is generated, enhanced and shared at each step.



Strategic Approach

Implement a strategy to achieve comprehensive, integrated disaster management

Coordinate its disaster management strategy with related disaster management strategies of other components of the health sector and other sectors, organizations, and agencies.

The first element of a successful program is that the health sector adopts a strategic approach to disaster management. That is to say that each component of the health sector will have an

A strategic approach ensures resources are being committed to comprehensive disaster management in a balanced and effective manner. An integrated disaster management framework is a means of organizing related activities to best apply them to achieving the desired outcomes. The health sector must also contribute to and support the activities of local authorities and others that have disaster management roles and responsibilities

overall plan of how it will develop, resource, and implement its disaster management program in conjunction with the relevant disaster management strategies of other components, sectors and agencies. These plans will be scaled appropriately.

A strategic approach to disaster management applies the concept of comprehensive emergency management through an integrated framework. It will involve cooperating with other agencies and jurisdictions to ensure the resulting activities and plans are coordinated. A

strategic approach uses existing resources and programs to achieve disaster management goals while recognizing when unique or specialized skills and technologies are required.

Comprehensive Emergency Management

“Comprehensive Emergency Management” is a key concept in modern disaster management practice. It’s focus on emergencies, rather than disasters, reflects the idea that successful management of vulnerabilities, resources and the environment will reduce the likelihood of an impact exceeding the disaster threshold. A program based on comprehensive emergency management ensures resources are being committed to disaster management in a balanced and effective manner. Comprehensive emergency management developed from the idea that a community progresses through four phases after a disaster impact: response; recovery; mitigation and; preparedness.

The response phase focuses on the immediate efforts to limit further harm and meet the community's basic needs. Recovery is the process of returning the community to "normal" that extends for many years and involves the physical, social and economic components of the community. Mitigation refers to the steps taken to eliminate or lessen the risk of future impacts while preparedness pertains to increasing the community's ability to respond to future impacts.

Each of the phases is dependent on the others. In reality, at any given time a community will be addressing all of these phases simultaneously, although the emphasis may shift between the phases, especially following an impact. The health sector needs to be involved in all phases.

Cooperation and Coordination

The success of a disaster management program depends on a wide range of agencies and organizations coordinating their activities before, during and after an emergency. There are often specific jurisdictional issues or responsibilities that need to be respected. Mitigation activities involve both physical and social components that need the cooperation of different groups to implement. An emergency response needs strong coordination to ensure all resources are being put to the best use. Post-disaster recovery is a long term process and will involve every part of the community.

The Emergency Measures Act (Chapter E80, CCSM) empowers local authorities to plan their response to emergencies and to take action based on those plans when needed. While this responsibility to prepare and implement community emergency preparedness plans and programs lies clearly with the local authority, the health sector must contribute to and support these disaster management activities. This should extend to participating on community planning committees that the local authorities are required to establish (Sec. 8 (a) Chapter E80, CCSM).

The Emergency Measures Act also gives local authorities special powers to "prevent or limit loss of life and damage to property or the environment" during a state of local emergency.

Examples of agencies and organizations to consult during planning:

Local:

- Municipal governments
- Emergency services (police & fire)
- Schools
- Churches and community groups
- Business

Provincial Departments:

- Health
- Highways & Government Services
- EMO
- Family Services and Housing
- Conservation (Fire Program, Water Resources, Environment)
- Aboriginal and Northern Affairs
- Office of the Fire Commissioner

Federal Departments:

- Emergency Preparedness Canada
- Health Canada
- Indian and Northern Affairs Canada
- RCMP
- Environment Canada

Other agencies:

- Manitoba Association of Native Fire Fighters (MANNF)
- Salvation Army
- Canadian Red Cross
- Amateur Radio Emergency Service
- Canadian Emergency Preparedness Association (CEPA)
- Utility service providers (e.g. gas, power, telecommunications, water)

These powers include, amongst other things, “to provide for the restoration of essential facilities, the distribution of essential supplies and the maintenance and coordination of emergency medical, social and other essential services” (Sec. 12 Chapter E80, CCSM). This must clearly be planned for and executed in conjunction with the health sector and other related agencies.

Other agencies and groups in the community may have disaster management plans that overlap with the health sector’s activities. The private sector, especially companies involved in natural resources (e.g. forestry or mining) or those that deal with hazardous substances, will have emergency response protocols. Non-government organizations (NGO’s) such as the Red Cross have significant international experience while community groups may have access to local resources and knowledge that would otherwise remain untapped. Neighboring components of the health sector should be consulted regarding cross boundary issues and mutual aid arrangements. A strategic approach to disaster management will ensure there are no gaps or conflicts between these external plans and the programs implemented by the various parts of the health sector.

Technical Information and Expertise

The formal study of disasters and their effects on communities dates back to the 1920’s. The modern emergency management profession grew out of the civil defense programs of the 1950’s and 60’s. Since then it has established its own best practices, professional organizations and qualifications. There are a growing number of emergency management practitioners graduating from university programs and gaining other qualifications.

Disaster management now encompasses research and applications from a diverse range of fields including business management, psychology, geography, sociology, planning, health, political science and engineering. Furthermore, it draws on an understanding of the earth sciences, such as meteorology and geology, as well as other specialties that look at extreme events. There are also technical topics, such as communications, that may require specialized knowledge and equipment.

The modern disaster management practitioner has the ability to access and interpret information from these various sources and can provide distinct technical expertise. Other aspects of the disaster management program will require general management skills in planning, budgeting, training, leadership and evaluation. These requirements can be met efficiently by integrating disaster management within an organization and using the existing talents of the staff.

Hazard Assessment

Hazard

Assessment

- Hazards
- Vulnerability
- Resources

Conduct ongoing hazard assessment.

Contribute information on health determinants & hazards to other sectors, organizations, and agencies.

Hazards are the result of an interaction between human activities and the natural and technological processes that can generate extreme events. It is important that the hazard, the community's exposure to the hazard, and the likely effects of the hazard on the community are all understood. This is accomplished through an all-hazards approach to hazard assessment.

An all-hazards approach ensures disaster planning achieves its aims efficiently. There is a danger that a community, or a sector such as health, will focus too much attention on any single hazard to the extent that it becomes prepared for one type of disaster and not for others. The all-hazard approach to assessment balances this by collecting information on the full range of threats so subsequent risk management decisions can be made appropriately. This allows planning to be more effective in all situations.

Every aspect of disaster management depends on accurate information about the hazards. It is important that everyone involved understands the hazards, the community's exposure to the hazard, and the likely effects of the hazards on the community. This is accomplished through developing and sharing an all-hazards assessment.

Different hazards can produce the same effects or consequences within the community. Power in a community, for instance, may be interrupted by a number of different causes such as major supply lines downed by wind or ice, technical equipment failures, or local lines damaged by accidents or fires. The common consequence of all of these events is a loss of electrical power and the effect this will have on individuals and facilities within the community that depend on power for safety and comfort.

The second advantage of an all-hazards approach is the efficiency of planning for the common effects of the various hazards, such as a loss of power, water, communications or access. All-hazard based assessment also identifies hazard specific problems. This allows one solution to be applied to range of threats while acknowledging that some hazards present unique dangers. This simplifies the implementation of the solutions, whether that involves a structural mitigation measure, training of response actions, or some other activity.

Some hazards that can affect Manitoba communities include:

- Severe Storm (lightning, hail, heavy rain)
- Strong Winds (including downburst)
- Tornado
- Extreme Cold
- Blizzard (heavy snowfall, strong winds)
- Ice Storm
- River Flooding (spring floods, flash floods, ice jam floods)
- Surface Flooding
- Dangerous Goods Incident (spill, fire, explosion)
- Transportation Incident (road, rail, air.)
- Pipeline Explosion
- Epidemic (Pandemic)
- Water Contamination
- Wildfires (Urban interface, Smoke)
- Fire (Own Facility or Neighboring Facility)
- Utility Disruption (Power Gas Water)
- Terrorism
- Civil Unrest (riots, etc.)
- Labour Disruption
- Mass Casualty Incident
- Space debris (meteorites, satellites, asteroids)

Collecting specific information about hazards is critical to the overall disaster management program. Risk management needs information for evidence-based decision-making. Mitigation and preparedness both need the information to determine what actions are necessary and most appropriate. Monitoring and evaluation will use this information as a yardstick. All disaster management activities will be more effective with detailed, current and accurate hazard information.

Strategic planning of the hazard assessment program involves determining what information is needed, accessing the information that is available and collecting additional information as required. It also involves managing the information to ensure its accuracy and timeliness. This includes assessing the quality of the information.

The hazard assessment process collects information about the three factors that combine to create a hazard: the events that can impact on a community; the vulnerability of the population to such impacts; and the resources the community can apply to cope with the impacts. Most disaster management decisions will rely on understanding the balance between these three factors.

Determining what information is required is the first step in the process. An initial round of information collection is useful to develop an overview of what is available and how it may be used. The range of hazard information will be as unique as the region it is being collected for.

Not every type of hazards will be of a concern to a particular community or to the health sector but it is important to only rule out a hazard after considering the historical evidence. Some events occur very infrequently but may still present a risk that needs to be identified and managed.

The factors that increase vulnerability to these extreme events are generally the same as the determinants of health. Manitoba Health's *Community Health Needs Assessment Guidelines* (1997) outlines a process for collecting and assessing this information. The Regional Health

Authorities are already implementing this or a similar process that could be closely linked with the hazard assessment program. It will also be necessary to gather information on the vulnerability of the community's infrastructure and economy. This will include looking at the vulnerability of the health sector's own staff, facilities and programs.

The final component of the hazard assessment process is to identify the resources that already exist in the community. The best way for the community to cope is to be ready to use resources that are familiar and easily available. Sometimes, however, an emergency can require the use of unusual resources or putting common tools to uncommon tasks.

Most hazard information will be obtained from agencies or services that collect and analyze the raw data about different natural processes, about the population and about the resources in the community. It is important to use reliable sources whose information can be verified if necessary. It is also useful to establish sources that can provide ongoing information. Some information may need to be collected directly, especially when it is about a specific facility.

All the information will eventually need updating. Some information may not change very often whereas some information may change rapidly, even during the course of a day. Meteorological information is a good example: long term climate information may not change significantly over the course of several years, precipitation estimates may be issued several times a year (in relation to flood or fire forecasting) and storm warnings may be issued and cancelled in a matter of hours.

There should be regular reviews of the information as a whole to ensure that the information is all still valid. An ongoing system of maintaining of some current information may also be needed. It is necessary to determine when information requires reviewing or updating as part of the strategic planning for the hazard assessment process. The goal is to have information that is as accurate and current as it needs to be for the purposes of risk management, mitigation and preparedness.

The level of detail is similar to how current the information needs to be. It is important to collect accurate information that is at the right scale for its purpose. For instance, national statistics on the number of people with mobility impairments may be useful for general vulnerability identification but will not be detailed enough to aid in planning specific response actions. This latter task may require lists of names and addresses collected from home care patient lists.

The information will also need to be collected at different levels, from the health sector wide overview down to individual facilities. It can also include targeting parts of the community for special attention, groups such as women, aboriginal people, the elderly, or children.

Information regarding the resources in the community may include:

- Health facilities (public and private)
- Health services (public and private)
- Transportation
- Accommodation
- Catering
- Communication (mass media and personal communications)
- Emergency services
- Utilities
- Trades and professions

The strategic goal of hazard assessment is to provide information for use in the health sector's other disaster management activities. The information needs to be accurate and current enough to support quality decision making and effective action. The health sector is also in a position to contribute to a better understanding of the hazards by local authorities and the public. The health sector will benefit significantly from sharing hazard information, by improving the flow of information in both directions and by helping others with their disaster management activities.

Risk Management

<p>Risk Management</p> <ul style="list-style-type: none"> • Risk Estimation • Risk Evaluation • Risk Control
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Implement a risk management process to support disaster management decision-making. This process will include risk estimation, risk evaluation, and risk control.

Contribute to the risk management activities of other sectors, organizations and agencies.

Risk management can be defined as “the systematic application of management policies, procedures, and practices to the tasks of analyzing, evaluating, controlling and communicating about risk issues” (Canadian Standards Association, 1997, p.3). Risk management is the process of understanding what the risks are and deciding how to control the risks appropriately, by addressing their consequences and/or their likelihood.

Risk is an expression of the chance of a disaster or loss of a certain size. Risk is not, however, synonymous with probability or chance nor is it the same as vulnerability. Risk is, in fact, the product of these two components, the likelihood of an event happening and consequences if the event does happen.

The concept of risk allows hazardous events to be compared more fairly. It helps limit the influence that recent experience or other subjective factors may have in decision making. It does not totally eliminate such factors, as they are valid considerations, but it prevents them from misguiding decisions.

Risk management is a critical component of an integrated approach as it provides the transition between problem identification (the all-hazards assessment step) and the appropriate treatment steps (mitigation and/or preparedness). Internal and external factors must be considered in the risk management process.

Risk management is commonly practiced in relation to management activities such as budgeting, contracting, capital planning, project management, and other organizational tasks. All of these applications of risk management are valid and will continue. The disaster management framework simply incorporates the information these practices generate and seeks to expand the range of risks considered to include disaster scale events.

Insurance is used as an important risk control method and so insurance companies play a significant role in risk management. Qualifying for insurance coverage and setting premiums will require risk management to be undertaken. Insurance providers may have specific risk assessment processes that form part of the policy request or renewal process. For instance, an insurance company may require information regarding a facility’s exposure to flood damage before issuing coverage. This information should be captured in the hazard assessment element and, through the risk management process, decisions regarding mitigation and preparedness activities can be reached.

Within this general management context risk management may be more confined to “the process of making and carrying out decisions that will minimize the adverse effects of accidental or unforeseen losses upon the goals and objectives of the organization” (Manitoba Finance 1999, Sec 3.0, pg. 1). These definitions lead to an understanding of risk management as a systematic process for making decisions about how to address risk. This understanding

RISK = PROBABILITY x CONSEQUENCE			
Probability	High	<i>Moderate Risk</i>	<i>High Risk</i>
	Low	<i>Low Risk</i>	<i>Moderate Risk</i>
		Low	High
Consequence			

also needs to include the concept of “risk” as “the chance of injury or loss as defined as a measure of the probability and severity of an adverse effect to health, property, the environment, or other things of value” (CSA, 1997, p.3). If the term

“hazards” is used in place of the latter half of this definition (an adverse effect to health, property, the environment, or other things of value) it is easier to see risk management as a systematic process for quantifying and making decisions about hazards. The challenge is expanding the scope of risk management, as it is currently applied to other issues within the sector, to include hazards or, in other terms, catastrophic risks.

Risk management decisions are also made in the community. Some of these decisions are the result of a conscious process, perhaps when a homebuyer decides lake front aesthetics outweigh the risk of flooding, but unfortunately many such decisions are made without complete information about the risks. At a larger scale local authorities make decisions on land use and development, often balancing economic and political factors with environmental and health concerns. The downstream results of poor risk management decisions will inevitably involve the health sector when the negative health consequences become apparent and place added demands on the system. Therefore it is in the health sector’s interest to become involved earlier by contributing to community based risk management.

Within a strategic framework, risk management ensures decisions about how to deal with hazards, through mitigation and/or preparedness activities, are evidence based rather than subjective. It is the process that transforms qualitative information collected about the extreme events, the vulnerability of the community and its resources into quantitative risks that can be measured and compared.

Mitigation

Mitigation

- Non-structural
- Structural

Reduce risk to programs, staff, and clients by implementing structural and non-structural mitigation measures, based on the results of its risk management decision-making process.

Promote mitigation (risk reduction) throughout the community.

Mitigation refers to actions intended to eliminate or reduce the risk from hazards to the vulnerable community. These actions are prompted by the potential risk of a hazard, rather than an imminent threat. Once a particular event is initiated, even if it is still in its early pre-impact stages, the actions taken to limit the harmful effects are more associated with preparedness and response than with mitigation.

Mitigation is primarily concerned with preventing a harmful interaction between extreme events and a vulnerable community - it is about getting out of harm's way. Mitigation may be directed at reducing the risk by managing the likely impact, the vulnerable community, or both. It may also involve transferring the risk in some circumstances.

The decision to mitigate a hazard is reached through the risk management process. Therefore these decisions will be influenced by costs, political perspectives, past experiences and other issues that will contribute to risk management. Risk management deliberation leads to four general options for dealing with a risk: elimination; reduction; transfer; or acceptance.

Mitigation actions eliminate or reduce the risk from hazards to the vulnerable community. The responsibility for mitigation lies individually and collectively with the community. The health sector has two significant functions in this process: directly reducing the risks to its facilities and programs; and advocating for risk reduction measures within the community.

Elimination aims to remove the risk by preventing interaction between the extreme event and the community. Risk reduction focuses on decreasing the likelihood that any interaction will result in damage. Transferring or shifting the responsibility for dealing with the negative effects is often accomplished through insurance. The final option of accepting the risk requires a conscious acknowledgment that the consequences must be dealt with if the event occurs. This is an acceptable solution if it is arrived at as the result of a risk management process and is not the same as simply ignoring a risk. Ignorance inevitably results in either an inability to cope with the impact or the unplanned transference of the responsibility to cope to another party.

The first three of these options are commonly grouped under the heading of mitigation. Mitigation, especially the prospect of eliminating hazards, can seem impossible. Identifying and implementing mitigation strategies depends upon understanding hazards as an interaction between an extreme event and a vulnerable community.

Mitigation activities are implemented because there is a risk but they are neither reactive nor preparatory in nature. They focus on avoiding or limiting the possibility that an extreme event will occur at all or, if it does, that the community will not be as vulnerable to its effects. Mitigation activities tend to be permanent and do not require a triggering event to be implemented. Activities that are undertaken when an actual event occurs or imminently threatens to, are more commonly considered response or preparedness activities.

The responsibility for mitigation lies individually and collectively with the community. That is to say that everyone and every organization within the community has a role to play in

Six principles have recently been suggested to help make mitigation more effective and more sustainable:

- Maintain and, if possible, enhance environmental quality.
- Maintain and, if possible, enhance people's quality of life.
- Foster local resiliency and responsibility for disasters.
- Recognize that sustainable, vital local economies are essential.
- Identify and ensure intra- and intergenerational equity.
- Adopt a consensus-building approach, starting at the local level.

Mileti 1999

mitigation and the community, as a whole, has to encourage and support mitigation activities. The health sector has two significant functions in this process: directly reducing the risks to its facilities and programs; and advocating for risk reduction measures within the community.

The health sector has a clear responsibility to protect its facilities, staff and clients through mitigation measures. Health care facilities must protect the clients already in their care while preserving the ability to offer services to the remainder of the population. This is particularly important for facilities providing acute and emergency health care services that will be in high demand following an impact. Mitigation measures at these facilities are very important.

The health sector also shares a responsibility with the community to support measures eliminating or reducing the risks to the population at large. Home care patients, for example, may be more vulnerable to specific hazard impacts. The health sector needs to play a role in addressing this vulnerability in conjunction with the patients and the community.

The health sector also has a vested interest in the community's ability to limit the harmful effects on its population, as this is primarily felt in terms of health (i.e. injuries). The negative effects of a disaster also extend to the economic and physical environments within the community and this, indirectly, can have detrimental effects of the population's health. While many of the most effective mitigation strategies, such as land-use planning, are the responsibility of local authorities, the health sector can advocate in favor of mitigation in order to improve the overall health of the population in the long term. Communities that can eliminate or reduce their exposure to hazards will be healthier due to a direct reduction in disaster-related injuries and illness as well as indirectly through an improvement in the determinants of health.

This will involve the health sector in the risk management decision-making of the community, local and provincial government, and the private sector. There are often very

different, even polarized, opinions regarding the risks in a community. The “not-in-my-back-yard” (NIMBY) phenomena generated by new property developments, industrial facilities, or manufacturing practices can divide a community. This can lead to a conflict between the economic and environmental goals of a community resulting in the disintegration of social networks and the loss of employment opportunities. The spirit of partnership and cooperation that is built around disaster management can help the health sector and the local authorities balance these conflicting priorities. The health sector may be able to offer neutral information regarding the health risks posed by changes in the community.

Mitigation can be achieved through structural and non-structural activities. Structural techniques depend on physical measures to eliminate or reduce the risk. Non-structural or social methods are aimed at managing the activities that make a community vulnerable or contribute to the risk. These mitigation measures are not uncommon nor are they only applicable to risks at the macro scale. Both structural and non-structural techniques can be put in place at a facility level. Many hazard mitigation activities may have additional justification from an occupational or workplace health and safety perspective. Combining mitigation measures with response actions may improve their effectiveness. This may be especially true when considering a highly variable risk or when an entire mitigation solution is not technically or fiscally possible.

Mitigation measures must be in place before an impact. One way to achieve this effectively is to consider mitigation as part of normal budgeting and planning

processes. It will be easier to incorporate structural mitigation measures into new developments or during planned expansions or renovations. This may even be a requirement of building codes and other regulations that only permit a pre-existing building to remain below the current standard until such time as it is significantly altered.

Wildfire offers an excellent example of a hazard that is open to a variety of mitigation activities:

- reforestation with less flammable species;
- forest management plans to limit fuel loads;
- fire breaks to prevent fires spreading;
- building codes specifying fire resistant materials;
- land-use plans for high risk areas;
- fire permit systems;
- spark suppression regulations for forest users;
- limiting forest access during high danger periods.

Retrofitting a facility or taking other structural measures solely for risk reduction purposes may be expensive though there will be situations when this is appropriate. It is far better, however, to consider mitigation as part of initial capital planning. The proceeding steps of ongoing hazard assessment and risk management will provide the information necessary to determine when mitigation is needed and help to determine what measures will be most effective

Mitigation requires an investment up front but it is important to remember what that investment is buying. Properly planned mitigation measures will protect people, saving lives and reducing health care costs. Mitigation will also preserve property and services, thus limiting (or even eliminating) the direct cost of their repair or restoration as well as reducing

the potential for lost revenues due to business interruptions. Together these will restrict any exposure to liability that may result in third party costs and the associated court expenses.

The techniques discussed so far are equally applicable to either risk elimination or reduction strategies. Risk transfer is the other option coming out of risk management that is usually linked more with mitigation than with preparedness. The most common risk transfer practice is engaging some form of insurance. Unfortunately insurance is only able to address the quantifiable financial costs of an impact. Insurance can not mend the intangible losses to an individual, organization or community. The loss of lives, the loss of a sense of safety, or the loss of opportunity that a community suffers in a disaster can not be covered by insurance.

Insurance premiums can, however, be a powerful motivator for other mitigation strategies. The process of applying for insurance should involve hazard assessment and making decisions about which risks should be insured against. This process can contribute to the overall disaster management program within the health sector. Furthermore, insurance companies are reluctant (that is to say the premiums are expensive) to underwrite hazards that could be avoided.

Mitigation needs to be an established component of a strategic disaster management program. It will not be totally effective if it is only considered as an afterthought to normal management and planning. By integrating mitigation activities into other developments or projects it is possible to control costs and reduce hazards.

Preparedness

Preparedness

- Planning
 - Emergency Response
 - Business Continuity
 - Recovery
- Training / Education
- Resource Management
- Exercising

Implement a disaster preparedness approach, based on its risk management decision making process, that will include planning, training, resource management and exercising.

Participate in the disaster preparedness activities of other sectors, sectors, organizations and agencies.

Emergency preparedness consists of the activities that take place before an incident that increase an organization's or a community's readiness to respond. The degree of readiness reflects the acknowledgement that something can happen, the assignment of a responsibility to respond and a commitment to put the plans, resources and infrastructure in place to ensure the response capability. Preparedness will focus on two aspects of emergency response. The most common, the Emergency Response Plan, deals with meeting the special demands created by an impact on the community. Business continuity planning aims to ensure services are maintained when the organization is impacted, even if the effects are limited to internal disruptions. Preparedness also extends to pre-planning activities aimed at post-event recovery.

Preparedness is an unlimited attribute: everyone can become more prepared without lessening the preparedness of others. This is important because resources are limited during an emergency response to the point of not meeting all the demands. This is the basic concept of disasters being events that have a greater impact than the community can cope with. By preparing for an impact an individual, organization or community raises their ability to cope and frees limited resources to be applied as needed. Therefore an effective preparedness program must include the whole community.

Preparedness increases the community's ability to respond effectively to hazard impacts and to recover quickly from the long-term effects. It involves planning, training and education, resource management, and exercising. It builds better coordination and cooperation between agencies within the community.

As with mitigation, each component of the health sector has a role in local community preparedness. The health sector's resources will be amongst the most important and most demanded during a response. By helping the community become better prepared the health sector will increase its effectiveness. Furthermore, many of the health sector's existing clients, such as home care patients or residents in long term care facilities, will be more vulnerable to the effects of a disaster. The health sector has a responsibility to prepare to meet these needs. A comprehensive preparedness program can fulfil this responsibility.

Business continuity planning and emergency response planning are linked. Emergency response planning deals with how an organization will help its clients cope with the extraordinary demands a disaster creates. In contrast, business continuity planning deals with how an organization copes itself with the impact of the disaster on its own systems and resources.

Business continuity planning aims to prepare an organization to adapt quickly and appropriately to sudden changes in its human resources and/or its physical environment. It includes issues such as: succession and delegation processes; alternative work locations, practices or technologies; intentional redirection of resources to address specific needs, possibly resulting in a loss or degradation of other services and; infrastructure or systems maintenance. The related field of “disaster recovery²” considers how to return an organization to normal, especially after a significant physical impact on a facility. In modern businesses these two fields are strongly associated with information technology and management systems.

Both emergency response planning and business continuity planning involve the same basic process. There are four parts in a preparedness program: planning; training and education; resource management and; exercising. The first of these, planning, is the most fundamental as the others are intended to support the implementation of the plan. Unfortunately planning is often misdirected toward producing a document, the “Emergency Plan”, without giving appropriate consideration to the process.

Effective planning identifies and develops the organizational structure that will direct and manage an emergency response. The planning process also identifies who has the authority and responsibility relating to different aspects of the response. The planning process will develop the procedures and guidelines that will ensure effective and coordinated action. A written plan is created as a means of documenting the decisions that are made during this process. The most important results of the planning process are the coordination and shared understanding that is generated.

Good planning is dependent on good risk management, which in turn is dependent on quality hazard information. The hazard and resource analysis will have identified, in detail, the dynamics and impact potential of the threats. The risk management process will have determined which risks can be mitigated and which need to be addressed through preparedness. This also identifies the response actions and resources required, providing the answer to what plans are needed and which resources must be arranged. Resource plans can then be developed to utilize “on hand” resources and to obtain resources to meet any shortfall.

Plans are only as good as the knowledge and capability of the people who are required to implement them and the clients they serve. The development of staff training and education

² The business continuity field has appropriated the term “disaster recovery” with specific reference to the recovery of information and business systems. There are broader health considerations around community based disaster recovery that include mental health, rehabilitation, epidemiology, and other social and economic factors affecting the determinants of health.

programs to provide the knowledge and skill necessary to implement the plans is crucial. Public education on responsibilities, possible mitigation actions and what the public can expect from responding agencies is also essential.

Training and education is a key to minimizing the impact of disasters and to ensure a robust and resilient response system and population. It does not stop with the individual, it includes the need to train groups who will work together during disasters, both within the organization and external systems. Plans must be examined to identify these needs.

The efficient and effective management of resources is essential in times of disasters. By their definition, disasters are situations when resources are overwhelmed. The availability and conditions of physical resources is as essential to the response as the plan and staff. The threat and resource analysis provides for the essential information needed to identify resource requirement, resource availability and shortfalls. Resource management ensures that existing resources are operational. The plan includes the need to maintain the components, systematically purchase and upgrade equipment as needed. Furthermore, the resource management plan needs to address the obtaining of additional resources needed to respond during an event.

Exercising is the fourth and culminating component of response preparedness. Exercising brings the skills, knowledge, functions and systems together and applies them against event scenarios. This provides the closest thing to an event to evaluate the state of response preparedness. The type and conduct of the exercises is dictated by the purpose of the exercise and participant needs.

Building an emergency response preparedness program consists of all four components conducted in an integrated program. The program is a systematic approach to doing all the activities required by the individual components and where possible, combining activities where cost, efficiency and greater effectiveness can be achieved.

Due to the ever-present threats to our communities, emergency response preparedness is a continuous undertaking. There is a constant need to maintain skills and knowledge. Each time there is a change in the threat, staff and/or resources there is a need to revisit plans, training, and resources management. Each time any of these change, there is a corresponding need to exercise to validate the changes in the response capability.

Exercises are generally classified as:

- Tabletop: discussions and problem solving in an open forum.
- Paper: event and response actions simulated using paper as the form to communicate and take action.
- Communications (electronic): event and response actions are simulated and all information flow is conducted using the communications systems which would normally be used to facilitate information flow.
- Practical or field exercise: events are physically simulated. Responses are carried out using the resources that would be employed during a "real" emergency or disaster.

Quality Improvement

Monitoring & Evaluation

- Community
- Systems
- Environment

Utilize a quality improvement approach to disaster management.

Hazards and disasters are products of the interaction between the environment, the community's vulnerable population and the community's coping resources.

These three factors are dynamic and their fluctuations significantly alter the risks facing the community. Monitoring these factors provides a means of determining if the community needs to adjust its level of preparedness.

It is also important to monitor the components of an organization's preparedness program, including its plans, staff skills and resources. These activities provide an indicator of the state of preparedness within the organization that can be compared with level of preparedness best suited to meet the risks.

Disaster management is the dynamic application of solutions to an uncertain and changing set of challenges. An ongoing process of evaluating the progress of programs and monitoring the physical, social and economic environments is crucial to maintaining a disaster management system that is adapted to the current local conditions.

The information that is included in the hazard assessment process and used in risk management decision making needs to be monitored. Information generated by mitigation and preparedness activities, such as staff resource lists, also needs to be watched for changes. It is important to identify who is responsible for monitoring information generated by these sources. This is especially true in a situation where information needs to be monitored by someone other than the original source.

Monitoring can be a means of triggering a reassessment of hazard information or a review of a risk management decision. Some sources that can provide these indicators include RHA business plans, capital expenditure proposals, Provincial and national statistics reports, or Community Health Needs Assessments, to name a few.

One way of monitoring information is to check its currency each time it is used in decision making and to create a link from the decision back to the information. This way when the information is updated it is possible to see which issues or decisions may need to be reviewed.

For example, the number of buses needed to evacuate a facility will depend on the average number of people in the facility at any given time. Once this average is determined it will be possible to contact a local transit provider and make arrangements to obtain buses during an emergency. If, however, the facility's occupancy level increases significantly it may be

necessary to review how many buses are needed and whether the existing supplier can meet this need. From a practical perspective this may mean that the evacuation plan notes the date of the occupancy information so it can be easily seen to be current and the vulnerability assessment should cross-reference the occupancy statistics to any planning decisions that are based on this information.

A community can utilize a range of mitigation and preparedness actions to decrease the risks it faces. It is not reasonable, however, to wait for an emergency to escalate to discover if these measures will prove sufficient. When the constantly changing nature of the risks is also considered it becomes clear that an ongoing process of evaluating established mitigation and preparedness measures is necessary.

The most common tool for evaluating disaster preparedness activities is an exercise. While exercises are valuable as a training tool, used to practice skills and build confidence, it is important that exercises also help identify shortcomings. Mitigation measures can also be evaluated through exercises that test structural systems.

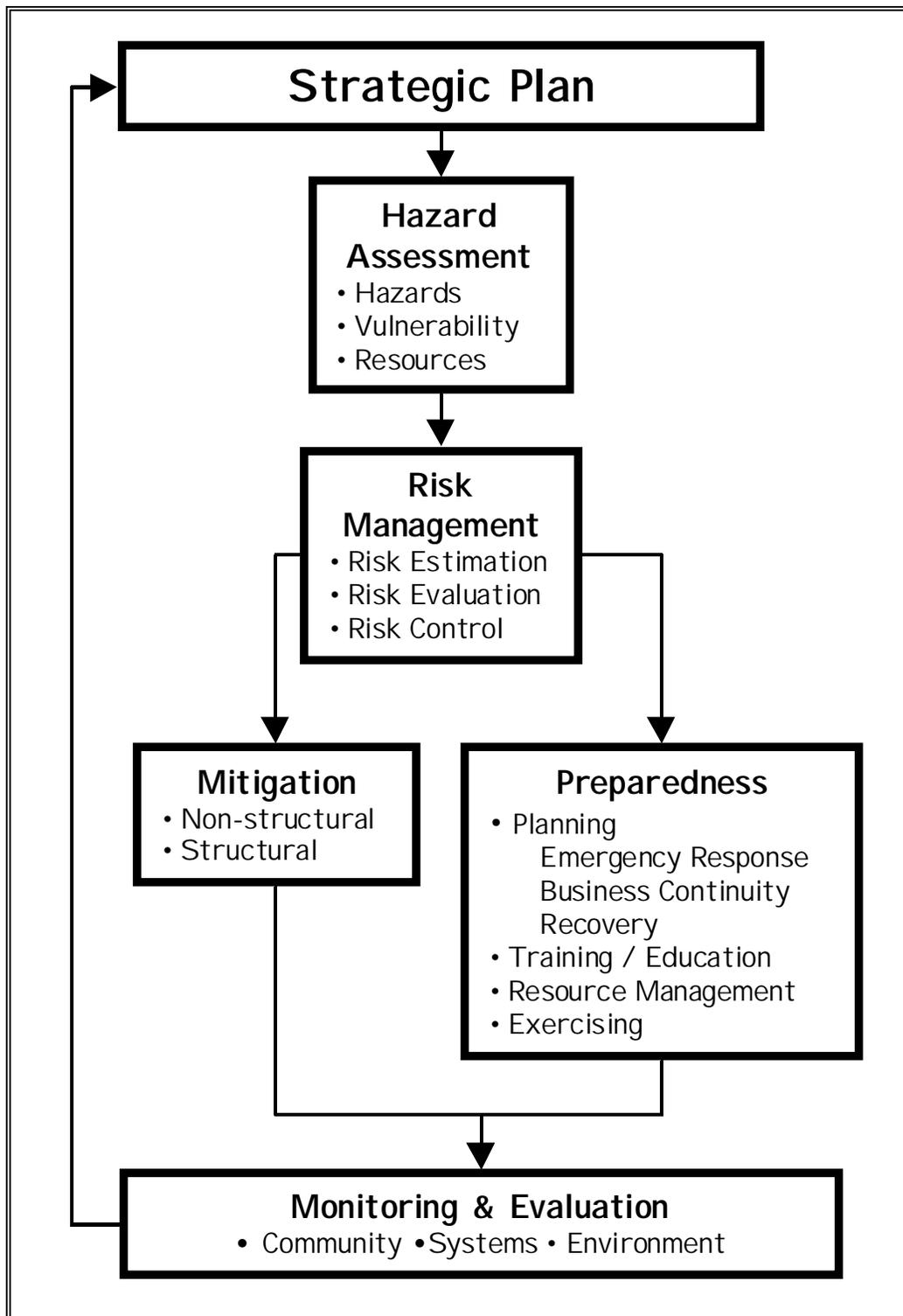
Another technique that can be used to evaluate mitigation and preparedness activities is peer reviews of programs and plans. Such reviews can take the form of comparing solutions to common problems, revisiting decisions making to ensure no unintentional bias affected the results, or even simply including different presenters in the training process to inject a fresh perspective. These methods do not need to be as formal or stringent as audits or accreditation reviews that also form part of the evaluation toolbox.

Unfortunately severe incidents do occur that also test the success of mitigation efforts and the viability of preparedness actions. It is therefore necessary to evaluate the response and recovery activities following a hazard impact. Emergencies are always an opportunity to assess performance, even when the negative consequences are limited by the preventative and reactive actions. Isolated or minor events often present the only chance to test systems under actual conditions because even the most carefully planned exercise cannot duplicate the range of circumstances nor the level of uncertainty and intensity that are experienced during a real emergency.

These evaluation techniques can be extended to hazard assessment and risk management activities as well. Individual and departmental performance appraisals may be one means of documenting how well information is being collected and used.

An integrated quality improvement and monitoring system will ensure that the disaster management strategy, as a whole and through each of its components, continues to meet the needs of the health sector and the community. It will also provide a means of demonstrating the disaster management program is being implemented as set out in the strategic plan.

Integrated Disaster Management Model



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