

BC Coroners Service Mass Fatality Response Plan

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Emergency
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Show me the manner in which a nation cares for its dead, and I will measure with mathematical exactness, the tender mercies of its people, their loyalty to high ideals, and their regard for the laws of the land. —William Ewart Gladstone, British Prime Minister, mid–late 1800s

I. Purpose

The purpose of the British Columbia Coroners Service (BCCS) *Mass Fatality Response Plan* is to address how the BCCS will prepare for and respond to mass fatality incidents (MFIs) within the province. The plan outlines the major components of a mass fatality response, whether natural or human-caused, and provides for the proper coordination of MFI response activities.

The plan establishes the means by which human remains should be respectfully and ethically handled in disaster situations having significant numbers of unexpected fatalities. In a disaster, it is the ultimate goal of the BCCS to identify deceased victims, human remains, and body parts, and repatriate the remains back to the legal next-of-kin and/or the country of origin.

It is important to note that in Canada, there is currently no existing national body to coordinate fatality management assets. Likewise, there is no national fatality management response plan. Each province or territory is responsible for creating and exercising its own plan.

Specific and detailed procedures are covered in depth in the separate BCCS *Mass Fatality Response Operational Guidelines*.

II. Definitions

Antemortem (AM): Prior to death; AM records include information and details about a person prior to death (e.g., dental or medical records, height, weight, tattoos).

British Columbia Emergency Response Management System (BCERMS): The BCERMS is a comprehensive management scheme that ensures a coordinated and organized provincial response and recovery to any and all emergency incidents in BC. The broad spectrum of components of the BCERMS includes operations and control management, qualifications, technology, training, and publications (Provincial Emergency Program, Emergency Management BC, Ministry of Public Safety and Solicitor General, Province of British Columbia, Emergency Management Division, & Justice Institute of British Columbia, 2008).

BCERMS Response Goals: In order of priority, the BCERMS Response Goals are the following:

- Provide for the safety and health of all responders.
- Save lives.
- Reduce suffering.
- Protect public health.
- Protect government infrastructure.

- Protect property.
- Protect the environment.
- Reduce economic and social losses.

CBRNE: Common acronym that refers to Chemical, Biological, Radiological, Nuclear or Explosive (e.g., bomb blast) incidents.

Coroner: Per the BC Coroners Act (2007), *coroner* means the chief coroner and the deputy chief coroner, and a coroner appointed under section 54 of the Act.

Disaster: A disaster is a predominantly social phenomenon that occurs when a hazard intersects with a vulnerable community in a way that exceeds or overwhelms the community's ability to cope and may cause serious harm to people's safety, health, or welfare; to property; or to the environment. It may be triggered by a naturally occurring phenomenon with origins in the geophysical or biological environment, or by human action or error, whether malicious or unintentional, including technological failures, accidents, and terrorist acts (Public Safety and Emergency Preparedness Canada, Emergency Management Policy Directorate, 2007).

Disaster Victim Identification (DVI): DVI is the term used internationally to represent the overall process for the identification of disaster victims. DVI is a significant part of fatality management and encompasses the search, recovery, antemortem data collection, postmortem data collection, reconciliation, identification, and repatriation aspects. The term originates from the International Criminal Police Organization, INTERPOL. The most important requirement for victim identification work is the application of international standards, which are the common basis for the work in multinational DVI operations. DVI teams work in an interdisciplinary manner and engage the services of experts in various fields, as needed (INTERPOL, 2009). The BCCS has established a DVI task force (see Appendix B).

Fatality: *Human remains*, *dead*, and *decedent* all refer to a human fatality. Fatality should *not* be interchanged with the term "casualty," as a casualty could mean dead or *injured* as a result of various circumstances (State of California, Governor's Office of Emergency Services, 2007).

Fatality Management: This term refers to the functions performed by the BCCS when large numbers of fatalities need to be managed and processed with a command and control structure in place. Generally, these functions, which fall under the authority of the Coroners Act (2007), are search and recovery of human remains, PM data collection process, AM data collection process, reconciliation and identification, repatriation, and personal effects management. The BCCS cannot perform these functions alone and will rely heavily upon police identification services and other relevant provincial and federal agencies and stakeholders to provide operational and logistical assistance during a MFI response.

Incident Command System (ICS): A standardized on-scene emergency management concept specifically designed to allow its user(s) to adopt an integrated organizational structure equal to the complexity and demands of single or multiple incidents, without being hindered by jurisdictional boundaries (Provincial Emergency Program, Emergency Management British Columbia, Ministry of Public Safety and Solicitor General, Province of British Columbia, Emergency Management Division, & Justice Institute of British Columbia, 2008).

Mass Fatality Incident (MFI): An incident where more deaths occur than can be handled by local coroner and fatality management resources. This may be due to a single incident or multiple incidents. Incidents may be the result of, but are not limited to, natural and human-caused events such as fire, flood, earthquake, structural collapse, transportation disasters, or CBRNE incidents. This definition does not exclude multiple deaths that could be handled within existing local resources but which have circumstances that demand a DVI approach for the integrity of the identification process.

Personal Effects Management: Personal effects management is an important component of fatality management. The term *personal effects* refers to the items (e.g., suitcases, jewellery, clothing, wallets) that had been carried by, or transported with, an individual who has died in an incident.

Postmortem (PM): After death has occurred; PM records include information and details that are collected from a decedent after his or her death (e.g., physical descriptors, dental data, fingerprints).

Reconciliation: Reconciliation is the process of matching human remains to a known individual(s). This process, in order, involves the collection of AM and PM findings, classification (using variables such as age or gender to classify), preparation of a list of key AM and PM markers, first matching, individual comparison, and finally positive identification or rejection (INTERPOL, 2009, p. 42).

Reduce Suffering: The third BCERMS goal, which relates to fatality management. This is based on the premise that expedient identification of the dead will reduce societal suffering.

Repatriation: The term used for returning the deceased to their country of birth, nationality, or permanent residence (State of California, Governor's Office of Emergency Services, 2007).

Unified Command: As related to ICS, unified command is when different jurisdictions and agencies are responsible for some aspect of the response to the incident at the site. The intent of unified command is to build a consolidated action plan for the response that recognizes the need for each agency to play its part and successfully fulfill its mandate. This increases the effectiveness of the response to a multijurisdictional or multiagency incident (State of California, Governor's Office of Emergency Services, 2007).

III. Authority

In the Province of British Columbia (BC), the identification of the dead in a disaster is the responsibility of the BCCS. The Coroners Act (2007) is the guiding legislation that gives coroners the authority to conduct death investigations that are listed in Section 2 of the Act.

The responsibilities and functions of the BCCS include

- ascertaining and clarifying the facts of all sudden and unexpected deaths in BC to determine the identity of the deceased and how, when, where, and by what means the

- death occurred. Deaths are classified as one of the following: natural, accidental, suicide, homicide, or undetermined;
- reviewing all deaths of children under the age of 19 in the province;
 - ensuring that no death is overlooked, concealed, or ignored;
 - producing a judicial document, either a coroner's report or a verdict at coroner's inquest, that reports on the findings of the coroner's investigation;
 - making recommendations, where appropriate and feasible, to both public and private agencies so that a similar death is less likely to occur in the future;
 - conducting inquests (quasi-judicial court proceedings) when mandated by the Coroners Act (2007), when there is a strong public interest in the circumstances of the death and it is deemed appropriate by the chief coroner, or if there is potential for the prevention of death in similar future circumstances; and
 - collecting death information and conducting statistical analyses.

Prevention of death forms a critical part of the overall mandate of the BCCS. Following a disaster, the responsibilities and functions of the BCCS expand to include a number of fatality management objectives. The BCCS must establish an effective command and control framework for the management and direction of

- the complete search and recovery of deceased victims (including transportation and storage);
- PM data collection;
- AM data collection;
- reconciliation and identification of victims (legal certification of death, repatriation, and disposition); and
- personal effects management.

These duties may be in concert with law enforcement, particularly if the incident is criminal in nature. The BCCS investigation runs parallel to the police criminal investigation. The BCCS will not compromise a criminal investigation; however, all handling and examination of human remains are facilitated by, and under the legal authority of, the BCCS; this includes the management of the five aforementioned fatality management objectives.

IV. Scope

BCCS mass fatality management response is based on a capabilities-based planning approach whereby established practices and procedures are used to build competency and a measurable level of preparedness. Although the BCCS comprehends the risk-based, all-hazards approach to disaster response, it is important to note that mass fatality response involves a complex victim identification process that is reliant upon established capabilities and processes. The need for specialized capabilities supersedes *specific hazard* planning.

The framework for this plan was constructed after two years of dedicated research by the BCCS Disaster Response Coordinator, Identification and Disaster Response Unit (IDRU) at the Office of the Chief Coroner. Academic literature, documents on incident-specific lessons learned, and

white papers from recent MFIs from around the world were reviewed and contemplated. In addition to the literature, numerous mass fatality plans from the United States (US) and the United Kingdom (UK) were critically assessed and evaluated according to the acceptable fatality management plan objectives as listed by the World Health Organization (WHO) and the Pan American Health Organization (PAHO) in 2006.

PAHO and WHO produced the *Mass Fatality Plan Checklist* (PAHO & WHO, 2010) based on the London Resilience *London Mass Fatality Plan* (2006) and *Management of Dead Bodies after Disasters: A Field Manual for First Responders* (PAHO, WHO, International Committee of the Red Cross, & International Federation of Red Cross and Red Crescent Societies, 2006). The essential elements on this checklist were used as a general guideline for this plan.

Throughout the research and writing phases of this plan, a consultation-based process was relied upon. The Disaster Victim Identification (DVI) BC task force provided feedback and commentary over a two-year period and assisted in refining the overall content. After the first draft was completed, the plan was disseminated internally to parties at BCCS and externally to private, local, provincial, and federal stakeholders for comment. During the last phase of consultation, the plan was sent out to two international subject matter experts in the UK for assessment. All feedback was considered, and all necessary changes were made. More specifically, the consultation with international experts solidified the overall plan and ensured that all relevant issues were addressed and articulated per international best practices.

The tenets of the *BCCS Mass Fatality Response Plan* (as well as the separate *BCCS Mass Fatality Response Operational Guidelines*) are based on international best practices, INTERPOL's *Disaster Victim Identification Guide* (2009), and the Incident Command System (ICS). The culmination of the above-noted processes has resulted in a provincial plan that is thorough, comprehensive, and ethical.

Whereas it is understood that in other countries and provinces, law enforcement agencies may take the lead when a MFI occurs, it is the Coroners Service in BC that is the lead agency with the legal authority, per the Coroners Act (2007), to lead the mass fatality management response to the incident as it pertains to the search, recovery, identification, and repatriation of victims' remains. Collaboration with law enforcement agencies and other major stakeholders is necessary, and an interdisciplinary approach to disaster victim identification will always be required.

Pandemics, epidemics, and mass illness outbreaks are recognized as events that could produce additional response issues for the BCCS. The Ministry of Health would be the jurisdictional lead in such circumstances, and the role of the BCCS in these situations is limited, as outlined in Appendix A.

It is fortunate that BC has not yet experienced a catastrophic MFI. With over 50 identified natural hazards and countless human-caused disaster possibilities existing in the province, it is reasonable to project that a significant event will occur at some point in time. Recent international MFIs such as the ferry sinking in Cebu, the Philippines; the 2004 Indian Ocean earthquake and tsunami in Southeast Asia; the 9/11 attacks on New York City, US; and the 7/7 bombings in London, UK, have proven the importance of fatality management and related preparation and planning aspects. Seldom have Canadian federal, provincial, and territorial

governments had occasion to consider the complexities and consequences of an event that has resulted in an overwhelming loss of life. For this reason, it is prudent for traditional emergency managers to include fatality management within the grander sphere of emergency management.

When a MFI does occur within the province of BC, the BCCS will be challenged with a myriad of complex fatality management issues including, but not limited to, planning the BCCS response, efficient search and recovery of human remains, acquisition of temporary short-term and long-term storage facilities for human remains and personal effects, acquisition of temporary morgue facilities and related equipment for purposes of PM data collection, acquisition of facilities suitable for purposes of AM data collection at a family assistance centre (FAC), and expedition of legal certification of death and subsequent repatriation.

Even though the legal responsibilities for the aforementioned duties fall to the BCCS, local authorities and provincial and federal agencies should expect to be asked for logistical and/or operational support to assist the BCCS in the coordination of fatality management activities; requests would come through the appropriate communicative avenues. It is thus important to list some baseline planning assumptions that can assist local, provincial, and federal entities to better understand the critical issues that emerge and the factors that will affect the overall coordination of fatality management assets after a MFI occurs.

A. Planning Assumptions

1. The BCCS, through the Coroners Act (2007), is the authority responsible for managing MFIs. Even though other agencies and resources will arrive to assist, the coroner's authority and control of fatality management resources will not be assumed by other local, provincial, or federal agencies.

Key assumption: Support from a diverse group of public and private resources will be available to assist with BCCS MFI operations; this includes police forensic identification services.

2. It is assumed that when the BCCS has reached its operational capacity with respect to handling and responding to a MFI, provincial government assistance (in the form of resources and coordination efforts) will be acquired by the BCCS through the proper channels; requests for assistance from federal or other private resources may also be made, which may include any airport entities and authorities.
3. A MFI response requires a joint agency approach whereby an initial strategic assessment for establishing the initial (holistic) response strategy is conducted. A more mature strategic assessment will need to be conducted after the first 24 hours of the initial assessment and response to ensure that objectives are being met. It is assumed that this process will occur in concert with BCCS and under unified command. This process sits above and precedes the BCCS formal site assessment.
4. The Transportation Safety Board will investigate all rail, air, and marine incidents. The BCCS will coordinate with the Transportation Safety Board under these circumstances.

5. MFIs that are the result of CBRNE incidents complicate the response efforts of the BCCS due to the fact that fatalities are contaminated; this implicates the search, recovery, identification, repatriation, and disposition processes. Appropriate training and personal protective and safety equipment are essential.
6. A MFI that was the result of a known terrorist or criminal act would involve a criminal investigation by the Royal Canadian Mounted Police (RCMP) or other municipal police agency with jurisdiction.

These agencies, whether federal or provincial, with due regard for the criminal investigation, will need to coordinate and collaborate with the BCCS and assist the BCCS to meet its legislative requirements in recovering, identifying, and repatriating all human remains from the incident.

7. Terrorist activity will cause added implications for the BCCS response due to the possibility that suspect remains may be among the victim remains. If this is the case, the way in which all recovered remains are treated will be different than if no suspects were present in the decedent population. The entire identification process and the decisions being made regarding modality will be affected.
8. It should be recognized that a MFI with catastrophic effects may severely affect critical infrastructure, the supply of essential services to the site, and/or BCCS response.
9. A pandemic outbreak is predominantly a health authority issue and does not generally fall under the jurisdiction of the coroner. Pandemic flu is a natural disease occurring under natural circumstances. Human remains in these instances become the responsibility of the Ministry of Health and not the BCCS. The BCCS can assist with resources where and when requested, however (see Appendix A).
10. A MFI affecting local hospitals, postsecondary institutions, or correctional institutions will have additional fatality management requirements.
11. The BCCS has developed separate internal *Mass Fatality Response Operational Guidelines* to complement the *Mass Fatality Response Plan*. The operational guidelines detail the roles, actions, and responsibilities of those involved in the BCCS response. These operational guidelines are available internally to all BCCS personnel.
12. The ultimate goal of the BCCS after a MFI is to search for and recover all disaster victims and to identify the remains expeditiously and ethically without compromising any available evidence relating to causation or the potential identification of criminal activity.

The response will have consideration for cultural practice and religion and aim to reduce societal suffering. It is incumbent upon all agencies and levels of government to support fatality management efforts and ensure that grieving families obtain closure.

B. Planning Assumptions: Critical Limits

1. Canadian Disaster Database

The Canadian Disaster Database (Government of Canada, 2010) lists the natural and human-caused disasters that have occurred in BC from 1900 to the present. For purposes of establishing critical limits to the planning assumptions within this plan, only the disasters with fatalities within BC have been included. The preidentified hazards or risks that resulted in fatalities in the last 110 years are

- a. Natural disaster
 - Flood
 - Snow avalanche
 - Windstorm
 - Snowstorm
 - Landslide
 - Cold wave
 - Typhoon
 - Storm
 - Blizzard
 - Epidemic
 - Heat wave
 - Drought
 - Fire
- b. Human-caused disaster
 - Auto accident
 - Air crash
 - Fuel spill/sinking of ferry
 - Mine explosion
 - Terrorism
 - Bridge collapse
 - Train collision
 - Arson
 - Bomb
 - Mine collapse (Government of Canada, 2010)

2. Perceived Risk

BCCS planning assumptions must establish the maximum limit of fatalities that are intended to be covered in the plan. The *BCCS Mass Fatality Response Plan* is based on the perceived risk of the aforementioned disasters and hazards as detailed in the Canadian Disaster Database (Government of Canada, 2010). It should be noted that contextual

factors such as population, geography, and circumstance must also be considered when contemplating risk.

A mass fatality response plan must contemplate and declare the maximum number of fatalities that the plan is intended for. Having an agreed planning assumption based against perceived risk allows the BCCS to plan within defined limits and to articulate the maximum number of deaths that is being planned for.

Because no available academic or evidence-based research has been conducted worldwide in this particular area (i.e., planning for MFIs within defined limits), it thus becomes prudent to refer to and consider other countries' practices to establish a baseline number suitable for BC. It is important to note that there is no set methodology or equation for determining an appropriate maximum number of fatalities for any given mass fatality response plan.

As an example, it is reasonable to assert that BC is not as densely populated as the UK, but is similar in the sense that both human-caused and natural disasters would be just as likely to occur in either area; a significant air crash could, on any given day, occur in BC or the UK. The current UK planning assumptions have established that planning, resources, and training must be prepared to handle 2,400 fatalities at one time; this also carries the caveat that they must be prepared for up to seven incidents occurring at once with up to 1,000 of the 2,400 fatalities being compromised and/or fragmented (D. Forest, personal communication, October 11, 2010). What these numbers stipulate is that the maximum number of deaths that the UK mass fatality plan is geared for is 2,400. It would then be reasonable to state that the original UK planning assumptions do not intend to cope with a catastrophic incident involving 10,000 deaths, for example; this large number is out of scope with respect to a general DVI response.

3. Methodology

The BCCS *Mass Fatality Response Plan* must meet an agreed planning assumption based against perceived risk. Once the maximum number of fatalities is agreed upon, the BCCS can shape its resources, personnel, and training needs; this is directly correlated to funding.

- *Scenario:* Currently, the BC Ferries Spirit Class ferries (“super ferries”) carry 2,100 passengers and crew. The Coastal Class ferries carry 1,650 passengers and crew. The Cowichan Class ferries carry 1,200 passengers and crew. If an incident occurred whereby a ferry sank, there is the immediate potential for 2,100 fatalities.
- *Scenario:* Depending on the airline, a Boeing 747 aircraft can carry between approximately 400 and 500 passengers; an average Boeing 737 aircraft carries approximately 180 passengers in a two-class configuration. If a 747 and a 737 collided, there could be nearly 700 fatalities (not including fatalities from on the ground).

- *Scenario:* Ridership on the West Coast Express (train) is approximately 10,600 persons per weekday (American Public Transit Association, 2010). Trains can carry several hundred passengers at a time. If a train were to derail and crash, the number of fatalities could be in the hundreds.

For one single transportation incident in BC, there is thus the potential for an immediate 2,100 fatalities. If any of the above transportation scenarios were to coincide with a natural disaster or another transportation incident elsewhere in the province, the number of fatalities could easily exceed 2,100.

Taking the above-noted details into consideration, it would be prudent to set the BCCS planning assumption for an established maximum number of fatalities at 2,500 decedents. This would thus stipulate that the plan is intended to deal with up to and including 2,500 fatalities but not an incident with more than 2,500 fatalities.

The agreed-upon planning assumption regarding critical levels and the maximum number of fatalities intended to be covered in this plan is therefore 2,500 fatalities.

C. Provincial Level, Critical Issues

In any planning process, it is important to state assumptions. It is also necessary to identify any significant critical issues that could affect the implementation of the plan. For purposes here, critical issues are considered to be those fatality management issues that will require either support or action. The following critical issues emerged during the research and writing process and are worthy of consideration and attention.

1. Critical Issues: General

The care and management of society's dead in a MFI is complex, and the roles and responsibilities of government branches outside of the BCCS need to be outlined and clarified. The creation of an overarching provincial Comprehensive Emergency Management Plan should be contemplated to assist the province in dealing holistically with MFIs. This greater plan should serve to complement the BCCS *Mass Fatality Response Plan*, but not to usurp it. It should be an organized presentation of the ways in which the provincial government can best clarify its role in assisting the BCCS to meet the unique and stressful demands of MFIs. A provincial Comprehensive Emergency Management Plan should be aligned with existing legislation such as the Provincial Emergency Program Act (1996) and Federal Emergency Response Plan (2009).

Upon BCCS being notified of a MFI, it will be necessary to establish a joint information centre (or another similar crisis communications cell) to relay critical and consistent information within government and to the media and public. A formal crisis communication plan specific to MFI response in the province of BC is required.

Communication between BCCS staff, as well as between the BCCS and different agencies assisting at the MFI response, will be necessary. Communications will prove to be a significant challenge for BCCS staff because the BCCS does not operate on a radio

communication system. Communication will become more complex if there is more than one site involved or if telecommunications are compromised. Communication will always be a major factor and is usually the first thing that goes wrong in a response.

A MFI may present many unforeseen complexities with different entities or agencies (e.g., the military, native/aboriginal land, foreign consulates, federal and private landowners). There may be political or perceived jurisdictional issues. Federal and international issues may in particular need to be mitigated at a higher administrative level prior to a MFI. Apparent or recognized faith and cultural issues can be included here as well. There are currently no formal coroner/medical examiner mutual aid agreements between the BCCS and other death investigation agencies and jurisdictions outside of BC; this includes the US. Because of the general lack of fatality management assets across Canada, the BCCS would receive very limited assistance in the form of resources and personnel, if requested, from other provinces and territories.

2. Critical Issues: Planning and Organizational Aspects of the Response

- a. The BCCS response must be supported by the province. This includes the planning and management aspects as well as the search, recovery, identification, repatriation, and disposition of the human remains in an ethical and timely fashion, as set out in the Coroners Act (2007). The province must do all it can to support fatality management efforts, because any unreasonable delay or hindrance to this process would weaken public trust in the government's ability to reduce societal suffering by processing the dead and giving grieving families closure.
- b. The BCCS needs to be supported by the province in its efforts to deploy a task force to perform DVI duties, including the search and recovery of human remains, the operation of a FAC, the management and operation of a temporary morgue, the identification of decedents, the issuance of Coroner's Medical Certificates of Death, and the authorization for human remains disposition (see Appendix B).
- c. Letters of understanding should be written, prior to a MFI, with professionals and/or their organizations (e.g., pathologists, forensic anthropologists, forensic odontologists) to secure their services on a BCCS DVI task force during a MFI. Insurance concerns surrounding third-party liability coverage should ideally be covered by the province.
- d. Mobile teams (e.g., DVI teams) will be required at a BCCS MFI response. BCCS efforts to secure portable morgues and associated equipment and body storage units should be supported by the province, because these personnel and resources are required to carry out a proper response.
- e. Securing essential equipment (and associated services) such as refrigerated (reefer) trucks for transportation and storage of human remains are crucial resources for a MFI response; shelving, maintenance, security, and fuel would need to be included. The province may be asked to assist in securing these critical resources for the BCCS.

Note: Refrigerated trucks commonly used for food and grocery transport should not be contemplated for use in fatality management. If these were acquired and used for body transportation and storage, they would likely have to be purchased by the province because they would not be suitable to return to their previous industry service.

- f. When law enforcement agencies are investigating a suspected criminal or terrorism MFI, it will be incumbent on all agencies involved to work together during all phases of the fatality management response, particularly where and when evidence collection is critical. Close coordination and cooperation must be sustained between these agencies in such circumstances. This facilitation role can sometimes be best performed by high-level administrators within government.
- g. It is crucial that dynamic and mature risk assessments are continuous and ongoing throughout the response. It is important that the BCCS and the province award just attention to any risk or potential harm that may negatively affect operative, community, or organizational reputations.
- h. A CBRNE incident may hinder the BCCS's ability to respond to the scene and process the human remains forensically. The province would be asked to assist in helping the BCCS to evaluate the hazards and find a suitable solution to ensure responder safety and subsequent handling of the remains (following through to disposition).

3. Critical Issues: Recovery of Human Remains

- a. During a MFI response, it is vital that the human remains are tracked properly using an efficient numbering or tracking system. The tracking system must be implemented at the start of the incident when the first human remains are recovered. BCCS does not currently have a human remains tracking system. Although it is acceptable to do all of the traditional work by hand, the efficiency of the rate of recovery and eventual, subsequent identifications will be affected. The margin for human error increases without the use of an established tracking system. BCCS's efforts to secure a suitable exhibit tracking system should be supported by the province, as it will allow fatality managers to process the dead without compromising process or time.
- b. The management of personal effects after a MFI (e.g., commercial airliner crash) is a huge undertaking that most often falls upon the agency conducting the medico-legal death investigations if the incident is accidental in nature. If the incident is considered criminal or has an element of criminality, the police will take charge of exhibit management and personal effects management for continuity purposes. Human remains and associated exhibits will remain in the custody of the BCCS.

In an incident determined to be accidental in nature, it is hoped that the airline or carrier involved would have the capacity to manage, in concert with BCCS, the

personal effects. Without the assistance of the police, the designated airline company, or a contracted service (e.g., Kenyon International), the task would be near impossible for the BCCS to manage on its own. The province would be requested to provide assistance to the BCCS in the form of logistical support (e.g., locating or providing a facility) and/or personnel (e.g., for managing the effects). Retrieving, decontaminating and cleaning, tracking, storing, and eventually returning the effects to the next-of-kin or family is a daunting task and could take weeks, months, or even years to complete.

It is worthy of note that air crashes are treated as criminal events by law enforcement until proven otherwise. Even so, the BCCS must be prepared to handle personal effects and exhibits until this position is made clear by all investigating agencies.

- c. In a CBRNE incident whereby the fatalities are contaminated, there may be the logistical need to decontaminate the remains on-site before they can safely be transported and subsequently examined at the morgue. The BCCS will require assistance from outside agencies trained in hazardous materials and/or CBRNE incident response (e.g., military, police, and fire services). Adequate personnel and resources will be required to perform the decontamination of affected fatalities.

Also of relevance here is the concern of appropriate hazardous waste disposal. The province would be requested to assist with disposal and compliance with any regulations or requirements regarding toxic or hazardous waste.

The BCCS needs to integrate with other agencies to create plans and operating guidelines that address the response to CBRNE fatality incidents.

- d. If a significant disaster occurs and critical infrastructure is affected, it is reasonable to assume that efforts to perform mass-fatality management tasks, such as body recovery, could be significantly delayed. If this is the case, the BCCS may require assistance from the province to acquire generators, utilities, water, and/or other logistics such as heavy equipment.

4. Critical Issues: Transportation, Storage, and Morgue Operations

- a. The unique needs of a MFI response will put extraordinary operational pressure on the BCCS. Requests may be made by the BCCS to have the province assist in coordinating and locating resources for a suitable morgue facility (e.g., a warehouse or portable structure), temporary holding morgue facility (for interim placement of bodies until they are transported to the operational morgue), and/or refrigerated trucks for temporary, short-term, or long-term human remains storage. In anticipation of these requests, suitable vendors and suppliers should be identified ahead of time, and letters of understanding should be written to secure the services and assets. The province may be able to facilitate or allow temporary use of currently existing buildings or assets for BCCS MFI operations.

- b. Daily BCCS operations utilize public hospital morgues for autopsies and body storage. It is unlikely that these facilities will be suitable for MFI operations due to capacity restrictions and business continuity requirements.

Note: Use of sports centres, ice rinks, and iconic sites within a community for morgue use and/or body storage is strongly discouraged for ethical as well as psycho-social reasons.

- c. Eliciting assistance from out-of-province experts (e.g., forensic pathologists) may be required during MFI morgue operations. Recognition of external credentials may need to be considered and facilitated by the province in the event of a large-scale MFI.

5. Critical Issues: Repatriation and Disposition of Human Remains

- a. In BC, the death care industry (e.g., funeral homes) deals with the final disposition of the bodies. When this industry is overwhelmed, it may need the support of the province to perform efficiently. Legal timeframes and regulations, for example, may need to be adjusted to deal with a great number of decedents.
- b. If the death care industry does not have the capacity to deal with the number of decedents at hand, the province may need to consider implementing a standard method of disposition to ease the burden on the overall system.

The cultural and religious needs of the families of the decedents need to be considered throughout the fatality management process. Different groups have different needs when it comes to mourning, cremating, and burying. It is important to respect these differences and attempt to address them specifically at the disposition stage, particularly if there are issues surrounding common tissue (human remains that cannot be identified), mass burial (due to a health issue or biological event), fragmented remains (in terms of completeness of the body), and/or site commemoration.

- c. The notion of a mass burial for final disposition is something that should not be contemplated in BC unless it is mandated as a necessary measure to protect public health. Generally, dead bodies do not pose a health risk to the public unless there is a significant biological cause present at the time of death. There may be instances where the province may have to legally authorize a mass burial because cremation is not possible due to a biological contaminant or because the handling and processing of the bodies would pose a significant risk to fatality management and/or death care industry workers.

This poses a significant ethical issue for the BCCS and the province if such a declaration is made. Efforts to educate the families and the public will need to be undertaken to help explain the reality of the situation and the rationale for the decision. Creation of a memorial site or other tribute to the victims (e.g.,

memorial service) will need to be contemplated to appease the public and the families and assist them in their grieving process. The media must also be included in this process.

Regardless of the number of decedents, WHO and PAHO both support the ethical practice of formally identifying all decedents prior to final disposition. If the aforementioned measures for mass burial are deemed necessary, then unidentified victims should be buried separately with proper continuity and documentation processes in place. All relevant data and evidence from the body should, if possible, be collected prior to burial (e.g., DNA profiles, photos).

- d. The Ministry of Health Services, in concert with the BCCS, should establish procedures for certifying and registering large numbers of fatalities in the province of BC. If there are mass fatalities, the burden on the BCCS, the Ministry of Health (Vital Statistics Agency), and the death care industry will be extraordinary. Measures should be in place to deal with a mass influx of deaths so that Coroner's Medical Certifications of Death and provincial Registration of Death documents can be processed en masse.
- e. The BCCS, per Section 10 of the Coroners Act (2007), should contemplate how missing or destroyed bodies from MFIs will be certified, or not, in varying circumstances.

It would also be prudent for relevant judicial authorities to consider having policy and/or procedures in place for the purposes of expediting court petition processes in the event that any missing persons from the disaster cannot be certified as deceased by the BCCS (the Coroners' burden of proof must be satisfied for a death to be certified). Legally, cases such as these would fall under the Survivorship and Presumption of Death Act (1996).

- f. Inevitably, any MFI that occurs in BC will be used for historical reference after the fact. BCCS will thus need to establish policies pertaining to the retention and disposal of papers and exhibits associated with a specific MFI (e.g., for how many years DVI records are kept).

V. Mass Fatality Response Guidelines

The BCCS *Mass Fatality Response Operational Guidelines* outline the tactical roles and responsibilities of individuals deployed to a MFI. The guidelines are intended as an internal document within the BCCS. The guidelines include the roles and responsibilities of coroners, BCCS staff, DVI task force members, and other personnel deployed to the MFI. The guidelines serve to explain how BCCS will respond to a MFI and perform specific duties during the activation, operational, and deactivation phases of the incident.

The BCCS *Mass Fatality Response Operational Guidelines* are separate from the *Mass Fatality Response Plan*.

VI. Concept of Operations

1. BCCS Mission Statement: Providing exceptional public service through independent, factual death investigation to improve community safety and quality of life.
2. The coroner is responsible for the medico-legal investigation of a MFI.
3. Section 2 of the BC Coroners Act (2007) designates which deaths are reportable to the coroner. These include but are not limited to sudden and unexpected deaths such as homicide, suicide, accidental death, or natural death of a person not under the care of a medical physician, and undetermined death where cause of death cannot be determined. Coroners assume jurisdiction over such cases and, in summary, are responsible for establishing identity and medical cause of death. The Coroner is legally responsible for issuing a Coroner's Medical Certification of Death.
4. Coroners conduct a careful examination of the circumstances surrounding a death to determine the identity and understand how, when, where, and by what means an individual died. Forensic pathologists, toxicologists, DNA analysts, anthropologists, odontologists, and other specialized forensic investigators may be consulted to provide assistance in an investigation.
5. During large-scale fatality events, the BCCS utilizes the BCERMS and participates in unified command.
6. Per the established BCERMS goals, fatality management falls under the third goal, which is to "reduce [societal] suffering." The two goals preceding this goal are "responder safety" and to "save lives." These first two BCERMS goals must be satisfied at the site by the incident commander before the BCCS can physically respond to the incident and initiate a tactical fatality management response.
7. BCERMS is based on the ICS. In the ICS, the emergency response is separated into five primary functions: command, operations, planning, logistics, and finance/administration. They provide a foundation from which a response to an incident can be expanded or contracted according to size and severity. If the incident is manageable, the five functions could all be performed at the site. If the incident is large and the site requires support, then most functions could be managed by the set-up of the BCCS emergency operations centre (EOC).
8. When a MFI occurs, the BCCS has its own set of command, operations, planning, logistics, and finance/administration functions. The BCCS operations chief at the incident site would manage the site in concert with the site incident commander and the BCCS EOC operations chief.
9. The BCCS EOC provides support to the site(s). The BCCS EOC is situated off-site at the BCCS Office of the Chief Coroner (or at a regional office if necessary). The BCCS policy group exists parallel to but separate from the staff in the BCCS EOC. The policy group consists of high-level decision-makers within the BCCS (e.g., the chief coroner and

designates) and provides direction to the BCCS EOC director when required. The policy group's location is purposely stationed away from the BCCS EOC.

10. It would benefit the BCCS to have a BCCS liaison in the Provincial Regional Emergency Operations Centre (PREOC), if activated, to assist in facilitating communications between the BCCS and the PREOC.
11. A MFI is any incident that overwhelms local resources. A MFI may involve the deaths of a few persons in a remote region of the province or the deaths of hundreds of people due to an air crash or ferry sinking. If the local resources are unable to manage the incident, regardless of the number of decedents, it is considered a MFI.
12. A MFI may encompass one or more of the following complexities:
 - a. Chemical exposure event with contaminated fatalities.
 - b. Biological agent exposure event with infectious or toxic-agent contaminated fatalities.
 - c. Radiological exposure event with fatalities contaminated by radiation.
 - d. Nuclear exposure event with contaminated fatalities.
 - e. Explosive (e.g., bomb blast) resulting in fragmented, burnt, and often commingled remains.
13. In addition to the CBRNE variables, there are also complexities that emerge as a result of severe weather events (e.g., tsunamis, earthquakes) that result in drowning and/or blunt force injuries.
14. Air, rail, and marine accidents also present complexities where the human remains may be compromised by fire, water, and/or blunt force injury.
15. Pandemics and epidemics present a unique set of variables that may further convolute the death investigation and identification process (if the death is reportable to the coroner). Generally, pandemics and epidemics fall under the jurisdiction of the Ministry of Health Services. There are, however, important crossovers between the BCCS and the Ministry of Health Services, such as body storage, personal effects management, death certification, repatriation, and eventual disposition.
16. If the BCCS requires additional equipment or personnel resources for a MFI response, the requests will be channelled through a PREOC. This would include specialized assets such as decontamination of decedents exposed to chemical, biological, or radiological agents. It may also include equipment to facilitate the temporary morgue process (e.g., portable morgue structure and autopsy and forensic equipment).
17. The BCCS retains control of and responsibility for handling deceased victims. Any assets that are deployed to assist the MFI response operate under the direction of the BCCS. Once any requested fatality management assets arrive on the site(s), the BCCS has the responsibility to coordinate, integrate, and manage them.
18. The BCCS may have to engage with foreign offices and embassies in the event that a significant number of tourists and foreigners have died.

19. If personnel experienced in ICS operations are available from other areas of Emergency Management British Columbia (EMBC) or related business units within the provincial government, these personnel may augment the number of BCCS staff in certain EOC functions (e.g., the logistics section or the liaison officer).

VII. Organization

A. General

1. The BCCS is an agency that resides within EMBC and within the greater Ministry of Public Safety and Solicitor General.
2. The Chief Coroner, whose office is located in Burnaby, oversees the BCCS. There are a total of five regional offices, one in each of five BCCS regions within the province. These regions approximate the BC Health Authority Regions (Fraser Health Authority, Interior Health Authority, Vancouver Island Health Authority, Northern Health Authority, and Vancouver Coastal Health Authority), although there are some differences in the regional delineations. The BCCS regional offices are located in Victoria, Surrey, Burnaby, Kelowna, and Prince George. (For details, see section XII, BC Coroners Service Regions.)
3. The IDRU at the Office of the Chief Coroner is a specialized unit responsible for facilitating the recovery, identification, and repatriation of all human remains in the event of a MFI. In accordance with the agency's authority to determine identity in cases of sudden and unexpected death, the IDRU either directly provides or coordinates the delivery of forensic services, strengthening the overall analytical and investigative functions of the BCCS.
4. The IDRU is responsible for the coordination of disaster and mass fatality response for the BCCS. This includes all aspects of planning, research, as well as training and development. It also includes internal and external communications that are in concert with BCCS stakeholders.
5. Under the direction of the chief coroner and in accordance with the BC Coroners Act (2007), the IDRU has been tasked with developing a professional DVI task force based on established DVI guidelines and ICS principles and practices.
6. The DVI BC Task Force is a group of qualified forensic and investigative professionals who have the potential to be deployed by the BCCS to supplement the needs of the service when a MFI occurs within the province.
7. In the event of a MFI, the BCCS would notify EMBC (formerly the Provincial Emergency Program) and request a task number for purposes of resource acquisition tracking and third-party liability coverage for DVI BC Task Force volunteers and workers who would potentially be performing duties at the disaster site, temporary morgue facility, and/or FAC.

8. Various agencies and authorities (local, provincial, or federal) may be contacted through appropriate communication chains for possible coordination or use of services. Expected actions have not generally been contemplated for purposes of this plan. BCCS contacts could include but are not limited to
 - Airport representatives (various)
 - BC Centre of Disease Control
 - Canadian Forces
 - Canadian Red Cross
 - Fire services (including HAZMAT and decontamination capabilities)
 - Funeral service professionals/death care industry
 - General service volunteers
 - Health Canada
 - Indian and Northern Affairs Canada
 - INTERPOL (DVI)
 - Kenyon International
 - Local authorities (including emergency planners and managers)
 - The media
 - Ministry of Attorney General
 - Public Guardian and Trustee of BC
 - Ministry of Environment
 - Ministry of Health
 - Vital Statistics Agency
 - Ministry of Public Safety and Solicitor General
 - Emergency Management BC
 - Emergency Social Services
 - Search and Rescue
 - Police services, general investigation
 - Police forensic identification services
 - Police victim services
 - Provincial health officer
 - Provincial Health Services Authority
 - Disaster Psycho-Social Services
 - BC Ambulance Service
 - Public Safety Canada
 - Salvation Army
 - Transport Canada
 - Transportation Safety Board
 - Volunteer agencies
 - Worksafe BC

9. Regardless of the source of personnel (in-house, provincial, federal, supplemental, or volunteer), detailed time records must be maintained to document the nature and period of duty for each and every person assisting during the operation.

10. In the event of a multijurisdictional event or an event requiring unified command, then close coordination between the BCCS role (fatality management and processing of human remains) and the law enforcement role (criminal investigation and tracking of missing person cases) will be essential for the duration of the response. Assistance from police services (particularly police forensic identification services) will be a great asset to the BCCS and IDRU.

B. Notifications

1. Disaster notification of a MFI to the BCCS would normally come through a paging service vis-à-vis the coroner on call in the affected region. The police of jurisdiction would most likely initiate the page. However, notification may come through other channels or through news media broadcasts if the event is significant and it is recognized that human remains will require transport and processing. In rare instances, the BCCS may be the first agency to recognize a medical cause of death that indicates that a terrorist or CBRNE-related incident has occurred. In a case such as this, the BCCS would be the agency initiating notification of relevant authorities.
2. As in any reportable death, the notified on-call coroner will contact the regional coroner, who will subsequently notify the BCCS provincial director of operations.
3. The on-call and/or regional coroner should obtain initial details of the event. Upon receiving this information, the regional coroner will update the director of provincial operations, who will then notify the deputy and/or chief coroner.
4. At this point, a decision will be made as to whether a more established BCCS response is required and whether the services of the IDRU are required.
5. If the IDRU is required, the IDRU will activate its internal notification system to establish a ready list of DVI BC Task Force members, trained volunteers, and BCCS staff who are capable of responding within 24 hours to a designated location, if needed.
6. It must also be acknowledged that the normal day-to-day BCCS operations must remain unaffected; business continuity within the impacted region and within the BCCS must be ensured.
7. Once the BCCS is notified of a disaster or MFI and it is recognized that supplemental resources are required, the BCCS will activate this Mass Fatality Response Plan and the BCCS EOC. The BCCS will then proceed to contact the appropriate PREOC to advise of the internal BCCS activation. A task number will be requested by the BCCS EOC director to facilitate resource tracking.
8. During an activation of the BCCS EOC, all primary and support agencies for the BCCS MFI response will be accountable to the assigned operations section chief in the BCCS EOC.

9. In the event that the incident is confirmed to be an act of terrorism, the BCCS will not compromise the criminal investigation, but will work in parallel with law enforcement and other governmental agencies towards the positive identification of all victims and suspects. The BCCS will fulfill its mandate and continue with the medico-legal death investigation and operational components of fatality management.
10. If the BCCS is unable to activate its own EOC, the BCCS should liaise with a PREOC and request to have BCCS physically manage its operations from the appropriate PREOC. At a minimum, the BCCS should send a BCCS liaison to the PREOC to facilitate communications.
11. It may be necessary to initiate arrangements for travel and accommodations for responding support personnel and volunteers.

C. Actions: Organization of a Disaster Response Operation

1. Formal Site Assessment

Upon activation of the BCCS Mass Fatality Response Plan and BCCS EOC, a designated team will attend the scene or incident command post to perform a formal site assessment. Ideally, the assessment team will consist of two coroners (one from IDRU and the regional coroner) and a forensic identification specialist from the DVI BC Task Force or police agency of jurisdiction.

The classification and scope of the disaster will be taken into consideration, and appropriate assets required to process the human remains will be identified. The assigned coroner(s) will document the findings of this initial site assessment and relay the information to the BCCS and the EOC operations chief at the earliest opportunity.

A proper formal site assessment reports the following:

- a. What has happened
- b. Area extent of the scene
- c. Whether the deceased population is open or closed
- d. The condition of the remains
- e. Methodology to remove the human remains
- f. The identification method(s) likely to be utilized
- g. Approximate timeframe for remains recovery process
- h. Preferred location for a staging area(s) for arriving assets
- i. Considerations regarding the transportation of human remains
- j. Location of the Incident Command Post (and field incident commander) and contact information
- k. Contaminants or hazards present at the scene or on remains
- l. Site security concerns (e.g., is the site blocked off from public view)
- m. What information has already been released to the media
- n. Agencies already on site

2. Scope of the Event

The team conducting the formal scene assessment must also assess the scope of the event to anticipate levels of additional resources that might be required. These may include

- a. modifying the workflow in the regular morgue(s) to allow for segregation of daily casework and disaster-related casework.
- b. acquiring a separate morgue facility or unit and required equipment in the event that the incident occurs in a geographically isolated area or the scope exceeds the capacity of a traditional hospital morgue.
- c. acquiring supplemental morgue space and associated equipment for refrigerated human remains storage. This may include refrigerated trucks.
- d. acquiring suitable refrigerated storage for CBRNE-contaminated human remains.
- e. locating a suitable facility to house the BCCS Family Assistance Centre (FAC) for AM data collection.

3. Pre-Operation Meeting

When the formal assessment of the scene has been performed, the results will be reported back to the BCCS EOC operations chief and designates. A pre-operation meeting will then be held to determine immediate logistical needs of the operation including equipment, facilities, types and numbers of support personnel, transportation, and staging.

It is crucial that adequate time is taken at this planning stage to digest and comprehend the details of the site assessment; the pending response must be properly and methodically organized. This process should not be rushed. The objective of this meeting is to prepare the “roadmap” for BCCS MFI response, with consideration for all of the aforementioned points in subsections 1 and 2.

It is also important to take the time to identify any emerging ethical issues. If any are identified at this stage, the group will create a plan and address them as soon as is practicable.

4. Mission

After the pre-operational meeting, the next step will be to write the BCCS Incident Mission Statement. In no more than 50 words, the BCCS EOC operations chief and designates must clearly and succinctly articulate what needs to be achieved during the mission and how it is to be accomplished. This will serve as the basis for all subsequent planning. It also forces the BCCS team to slow down and focus.

After the BCCS Incident Mission Statement has been created, the first and second operational period plans should be written. Immediate objectives, alternate objectives,

variables, and recommendations should be included. This should be done in concert with the planning chief at the EOC.

5. Contact PREOC

If needed, a PREOC may be contacted and asked to assist the BCCS with the following tasks:

- a. Acquisition, transportation, and set-up of supplemental or temporary and portable morgue operations, either in an existing facility or at a remote location.
- b. Acquisition and transportation of supplemental refrigerated storage for remains received from the disaster site and for remains processed and awaiting release for disposition.
- c. Acquisition and set-up of FAC operations at a site removed from both the disaster site and the morgue.
- d. It may be necessary for the BCCS to assist law enforcement in establishing and setting up a call centre to manage incoming data generated about missing persons and those who may be dead. Data on persons reported deceased will be compiled and thereafter forwarded to the FAC for AM file creation.

6. Logistics

For any equipment that is not already part of the BCCS response, a PREOC may be asked to assist the BCCS with acquiring logistics, including initiating contact with appropriate vendors to supply equipment such as refrigerated trucks, X-ray machines, and processors, etc.

7. Federal Assistance

In the event that logistics resource requests for the MFI response exceed the capabilities of the province, the assistance of federal entities may be requested through the appropriate avenues (e.g., Provincial Emergency Program Act and Federal Emergency Response Plan).

VIII. Direction and Control

As aligned with proper emergency management EOC structure, all management decisions regarding MFI response are made at the BCCS EOC by the director and in consultation with the BCCS Policy Group; this includes the chief coroner.

If other agencies are tasked by the BCCS to perform missions related to the MFI on behalf of the BCCS, that agency will retain administrative control over its own resources and personnel but will be under the operational control of the BCCS.

Management of fatality-related operations under the direction of the chief coroner or designate is coordinated with the assigned site incident commander (who may be from another agency such as police or fire). BCCS assets assigned to the response remain under the chief coroner's direction and may be used in any way to supplement BCCS operations including liaison with the site incident commander.

Under the direction of the chief coroner or designate, and after the pre-operation meeting has occurred, the IDRUs and designates will organize the BCCS response to the MFI and be responsible for and oversee the search and recovery of human remains, the PM process, the AM process, reconciliation and identification, and management of personal effects, if required. Once the identification phase of the investigation is complete, the other investigative aspects of the incident, pursuant to the authority within the Coroners Act (2007), will be carried out by the regional coroner with jurisdiction.

The regional coroner with jurisdiction will be the coroner of record for the MFI for documentation purposes.

Volunteer groups and professional individuals may have the opportunity to assist the BCCS.

IX. Responsibilities

There are several key high-level operations involved in the BCCS' response to a MFI. Multiple functional areas have to be coordinated. These generally include

- A. Ethical considerations
- B. Search and recovery
- C. Exhibit tracking system
- D. Holding morgue operations
- E. Pre-processing transportation and storage
- F. PM data collection—morgue operations
- G. AM data collection—Family Assistance Centre
- H. Post-processing transportation and storage
- I. Reconciliation and identification
- J. Body release and disposition
- K. Personal effects management
- L. Data and records management (victim)
- M. Data and records management (finance and administration)
- N. Public information and incident progress report (media)

An overview description of each functional area is provided in this section.

A. Ethical Considerations

Coroners are faced with a myriad of ethical considerations during a response to a MFI; many emergent issues will affect operational decision-making. Although ethical considerations will often become apparent during the formal site assessment stage when the condition of the

remains is first contemplated, issues will continue to materialize throughout the MFI response. An ethics officer should be assigned in the BCCS EOC for all MFIs.

Each ethical concern should be individually addressed and mitigated at the earliest opportunity. Examples of some common ethical considerations during a MFI response are listed below:

1. Communicating with next-of-kin and families about the physical state or condition of the human remains (e.g., are they partial, fragmented, decomposed, etc.).
2. The modalities of identification that are to be utilized (e.g., autopsy versus no autopsy, dental versus DNA, or both dental and DNA).
3. A determination regarding the minimum size of tissue to be analyzed for DNA: This, in large part, is dependent on whether it is an open or closed population.
4. The eventual disposition of common tissue (tissue that will not be analyzed): The next-of-kin and family members should be engaged in this discussion.
5. Contamination issues: Are the human remains compromised? Can they be safely repatriated to funeral homes for families to view?
6. Sensitive discussions with the next-of-kin will transpire if the MFI is a result of terrorist activity and the suspects' remains are commingled with the victims' remains.
7. Internal ethical considerations or conflicts involving staff (e.g., worker care) should also be monitored and addressed.

B. Search and Recovery

The first major component to any MFI response is the search for and recovery of the human remains. The complexity of this task varies according to the circumstances and geography of the incident (e.g., a search area equivalent to five football fields or one confined area such as a train station platform). Search and recovery entails physically locating all of the remains and exhibits (e.g., personal effects at the site[s]) whether they are partial or complete, and recovering or removing them from the site to a holding or staging area for transportation to a designated morgue facility.

Task forces are created specifically for search, per the ICS. Each search task force is assigned a specific area, grid, or quadrant to search and should ideally be assigned at least one coroner, one forensic anthropologist, one forensic identification specialist (photography), a number of trained searchers (evidence-search trained), and a scribe. Search task forces systematically search for and flag evidence; they do not recover the remains or exhibits.

Task forces created specifically for recovery (and transportation to staging) will also be formed. Each recovery task force is assigned to follow a specific search task force in a particular area, grid, or quadrant and recover the remains and exhibits flagged by the search task force. Each recovery task force should ideally have at least one coroner, one forensic

identification specialist (photography), a number of trained exhibit recovery personnel (to systematically bag and tag remains and exhibits), and a scribe. Recovery task forces are also responsible for transporting the recovered remains and exhibits to the staging area.

The documentation process during the search and recovery is critical. All incidents are treated as criminal in nature until proven otherwise. For this reason, continuity of evidence and proper exhibit control procedures are crucial.

Tools and resources to assist in this process may include the use of Global Positioning System (GPS) units, Geographical Information System (GIS) units and total stations for mapping capabilities, general photography (including aerial), exhibit photography (close, mid-range, and overall), videography, cadaver dogs, and remote sensing techniques such as ground penetrating radar or infrared search. Stakes and pin flags will be required to mark the physical location of the remains and exhibits. Use of a radio frequency identification (RFID) or bar-scanning exhibit tracking system is preferred.

Important action items for the search and recovery phase of the response include

- Formally establishing the search parameters
- Clarifying what exactly is being searched for and recovered
- Clarifying what is to be tagged and photographed
- Clarifying what will constitute common tissue
- Establishing objectives and timelines: what will be achieved and by what time.

The success of the overall identification process is largely dependent upon the quality of the search and subsequent recovery of the remains. Search and recovery efforts are led by BCCS but are dependent on a multidisciplinary approach (e.g., use of task forces).

C. Exhibit Tracking System

All exhibits, including human remains, pertinent to the coroners' investigation must be given a unique exhibit number and tracked systematically to ensure accuracy regarding the location of the exhibit, description of the exhibit, date and time located, and by whom it was seized.

It is of the utmost importance that an exhibit tracking or numbering system is accurate, uncomplicated, and dependable. Although a computerized database system would be preferable, BCCS does not presently have access to one.

The following considerations must be in place for an exhibit tracking system to be reliable; this list is not exhaustive.

1. Ability to have a distinct numbering system for AM data collected from families (e.g., missing persons) that can be correlated with the other response components and cross-referenced.
2. Ability to have a distinct numbering system for PM data collected in the morgue (e.g., if a body bag is opened in triage and contains five unrelated human remains exhibits

as opposed to one single exhibit, the numbering system has to have the capacity to add on new exhibit numbers that can still be associated to the original bag or exhibit number).

3. Ability for personal effects to be correlated to unidentified or identified human remains and cross-referenced.
4. Ability for other relevant exhibits to be correlated to other exhibits and cross-referenced.
5. Ability to track fragmented remains.
6. Ability to track exhibits being recovered from different scenes and sites, if applicable.

These are general guidelines for the management of an exhibit tracking system:

1. The exhibit numbering process begins at the scene when the human remains and exhibits are located and recovered (bag-and-tag process).
2. The numbering system to be used (e.g., use of prefaces and series of numbers) must be formally determined and agreed upon prior to search and recovery task forces being deployed to the site or scene.
3. It is important to note that law enforcement agencies and the BCCS should each use the *same* exhibit numbering system at a MFI for human remains and personal effects exhibits. Numbering exhibits twice is not best practice; it creates confusion, is cumbersome, and may compromise the identification process.
4. During the search and recovery phases, it is important to acknowledge that individual human remains receive their own exhibit number. Partial human remains should never be placed in the same bag as other partial remains.
5. It is vital to acknowledge that if human remains are *not* connected by clothing or tissue, they are bagged and tagged separately as different exhibits; this applies to fragmented remains as well.
6. An exhibit numbering system must be consecutive and nonrepeating (e.g., Bag 1, Bag 2, Bag 3, etc).
7. Prefaces may be used to further delineate the exhibit. The following lists some examples; this is based on a fictitious incident:
 - a. RD 2010-1 (Richmond Disaster, 2010 [year], Exhibit #1).
 - b. RD F 2010-1 (Richmond Disaster, Floating remains, 2010 [year], Exhibit #1)
 - c. RD S 2010-1 (Richmond Disaster, Submerged remains, 2010 [year], Exhibit #1)
 - d. RD 2010-Grid A-1 (Richmond Disaster, 2010 [year], Remains recovered from Grid quadrant A, Exhibit #1).

8. Only intact bodies will receive a full BCCS file number (designation “Unidentified Human Remains”) upon arriving at the admitting station of the morgue, at the Morgue Operations Branch.

Until such time that a piece or segment of human remains is scientifically or medically determined to be part of an individual person, the exhibit numbers assigned in the field will suffice. Once partial or fragmented human remains are associated to a larger body part or body, the associated exhibits can then all be given the same BCCS file number, which will be followed by the exhibit number(s) assigned in the field for continuity (e.g., 2010-111-0001-RD2010-Grid A-1).

9. The AM numbering system (e.g., missing persons files) will not utilize any BCCS file numbers. Each file will only be collated by victim name (e.g., Surname, Given name 1, Given name 2). The AM system must be different from the PM system to effectively differentiate between the two sets of data.
10. Continuity is key: It is vital to enforce continuity at every stage of the process from the initial response to the release of the body.
11. The BCCS *Mass Fatality Operational Guidelines* outline this procedure in depth.

D. Holding Morgue Operations

At the discretion of the coroner, a temporary holding morgue may be used at the site. It is called transportation staging because the remains are securely held here for purposes of short-term, private storage. The remains are then transported, when appropriate, to the primary, designated morgue facility for processing. If there are an extreme number of cases, it may be prudent to obtain refrigerated trucks for the temporary storage.

As remains are recovered from the site and placed in the transportation staging area, they must be properly documented for tracking purposes; documentation of exhibits is of the utmost importance to ensure continuity. The length of time that the remains stay within this staging area is largely dependent upon the size, scope, and complexity of the event; this includes the number of fatalities.

In some cases, remains may be contaminated. If contaminated remains reach the transportation staging area, they will need to be decontaminated prior to being transported to the primary morgue facility. While awaiting decontamination services (set-up may take a substantial amount of time), it may be necessary to place the contaminated remains in a refrigerated truck for temporary storage. If this occurs, the reefer truck is referred to as a “dirty reefer.” Only after the remains are decontaminated can they be placed in an uncontaminated, “clean reefer” and transported to the morgue for processing.

Ideally, human remains should be refrigerated at about 4°C.

It may be necessary for the coroner and/or law enforcement to gather evidence and/or remove personal effects from the remains prior to being transported and/or placed in any refrigerated storage.

E. Pre-Processing Transportation and Storage

Pre-processing transportation and storage refers to the BCCS expanding its capacity to provide additional storage, transport, and morgue processing and find alternatives to the traditional methods used on a daily basis. If all normal means of body storage are exhausted (e.g., hospital morgues used for daily operations), additional storage such as refrigerated trucks may be required to house the remains on site or at a designated morgue facility. Remains are stored until identification is established and repatriation is facilitated.

It is important to stress that any remains from the site must be kept separate from any processed remains.

Remains in refrigerated storage should be kept on secure shelving units no higher than waist height (for ease of removal and with regard for staff injury prevention and safety). Hydraulic lifts are required for any bodies stored above waist height.

F. PM Data Collection: Morgue Operations

The PM data collection process is led by the BCCS but relies on a multidisciplinary approach. A brief description of general morgue operations is provided.

1. Location

The criteria for choosing the location of the morgue are based on a number of factors including size, scope, and location of the incident; condition of the remains (fragmented, commingled, burnt, intact); number of dead; and estimated recovery time. Based on these factors, the BCCS will decide if a portable, temporary facility will be required or whether the remains can be processed at the nearest suitable hospital morgue facility per daily operations.

2. Security

Once a location is chosen and the facility is set up, it will be necessary to hire general security for the site(s). Twenty-four hour security teams will be required to perform the following duties:

- Scene or field security to ward off any predators or scavengers (e.g., birds of prey or other land-based carnivores) and prevent the displacement or ingestion of human remains at the site
- Holding morgue security
- Body storage facility or refrigerated truck security
- Morgue operations security

- Family Assistance Centre security
- Data and records security if off site from coroner offices

3. Morgue Stations

In daily casework, a body stays at one station during examination or processing. In a MFI situation, the routine changes and the remains are moved through a series of forensic stations for efficiency.

Generally, the forensic station teams are

- Triaging
- Admitting
- Personal effects (and evidence, if applicable)
- Photography
- Pathology and toxicology
- Radiology
- Fingerprinting
- Odontology
- Anthropology
- DNA sampling

Depending on the circumstances of the incident, some or all of the above forensic stations would be utilized.

4. Autopsy Versus External Examinations

Depending on the circumstances of the incident, it may or may not be necessary to autopsy all remains. The decision whether to perform autopsies on all, some, or no cases will have to be made prior to the start of morgue operations. It may be prudent to perform only external examinations of the human remains.

5. Triaging

Triaging refers to the process whereby human remains are sorted upon entry. In conjunction with the admitting team, triage opens the body bags (or exhibit bags) and assesses whether there is one exhibit within, or more.

If more than one exhibit is housed within the bag (e.g., a bag is opened and there are remains from more than one individual, such as two left legs), each exhibit is given a separate number and bagged separately. This process is documented by the admitting team.

It can be beneficial to have an anthropologist doing triage to sort through the remains and assist with human versus nonhuman determinations and duplication of elements, if applicable.

6. Admitting

Each human remains exhibit must be formally checked in at the morgue. After being formally documented, the body, if intact, will receive a BCCS file number (with the original exhibit number appended at the end of the file number). If the remains are fragmented or partial, they will keep only the assigned exhibit number in the field. Once the human remains exhibit has formally entered the morgue and its entry documented, an escort will be assigned to accompany the exhibit through the morgue stations. The escort will formally sign out the exhibit with the admitting team upon exit of the morgue. The exhibit will thereafter be formally signed back into the designated storage facility. Personal effects are also separated and catalogued at this stage. All personal effects associated with specific human remains exhibits must be documented as such and bagged and tagged individually.

7. Personal Effects and Evidence Collection

Personal effects can assist in establishing a presumptive identification that can later, in conjunction with other evidence, lead to an established positive identification. Because it is possible to use personal effects for purposes of DNA analysis, the DNA specialist should be consulted prior to the exhibit being handled or washed.

If the personal effects are not hazardous or contaminated, it is common for them to be returned to next-of-kin or family for sentimental reasons.

Personal effects, if associated with human remains, are included as data on the PM DVI forms (pink).

Other exhibits recovered from the site may become important or relevant to either the coroner or law enforcement; continuity and documentation (including photography) are of the utmost importance.

8. Radiology (X-Ray)

Radiology, or X-ray, becomes important in the PM data collection process in the following instances:

- a. When commingled remains are being examined.
- b. When objects are embedded in human remains (e.g., jewellery, metal, other pieces of evidence).
- c. When there is evidence of AM injury or surgery, and pins, rods, or other medical devices are present. The PM X-rays can be compared to AM X-rays to assist with identification.

9. Pathology and Toxicology

The internal examination of the body or body part and the taking of toxicological samples can help to establish medical cause of death and/or contributing factors that led to death. Toxicology samples can be taken to analyze body fluids for substances such as drugs and alcohol. Trained pathologists are required for this station. The toxicology samples are drawn at the morgue and are thereafter sent to a toxicology lab for analysis. Either pathology or toxicology may or may not be required for processing remains in a MFI depending on the unique circumstances of the disaster.

10. Fingerprinting

If the circumstances of the MFI allow for PM lifting of fingerprints, palm prints, and/or footprints, police forensic identification specialists are trained to preserve ridge detail, lift prints, and thereafter analyze, compare, evaluate, and validate (ACE-V) the PM prints to any existing AM prints. AM prints may come from police criminal records, personal effects at the victim's residence (e.g., a CD case), or other means such as employer or immigration records. Through the ACE-V process, a positive identification can be established.

11. Dental Processing and Odontology

Specialists are required for this function within the morgue. Forensic odontologists in BC are trained to perform forensic examinations by taking PM X-rays and charting the teeth and/or dental appliances according to the INTERPOL DVI standards. The PM X-rays and charting are compared to available AM dental records and can serve to establish positive identifications. Jaw resection is not encouraged but may be necessary; this is an ethical consideration that should be addressed prior to the activation of morgue operations.

12. Anthropology

Trained anthropologists can examine skeletal remains and provide a proper inventory (e.g., number of individuals or bones present and absent), identify fragmentary remains as bone or human bone, and provide an assessment of side of bone; peri-, AM, or PM trauma; pathological conditions; and age, stature, sex, or racial characteristics of the decedent. Anthropologists may also help identify AM conditions or characteristics that may correlate with AM medical records and assist in eventual identification.

13. DNA Sampling

DNA processing may assist in identifying victims when other modalities are not available or possible. If the remains being examined do not have any other identifying features (e.g., fingerprints or dental), then DNA may be the only way to establish a positive identification, provided that familial or decedent AM samples are available for comparison.

It is important to establish procedures to prevent cross-contamination. DNA specialists should lead and supervise sampling efforts and be consulted to ensure that the proper specimens are being taken. The DNA specialist will know which bone or tissue will yield the best profile results.

DNA specialists can also assist with determining which lab facilities to utilize and how many samples should be tested.

G. AM Data Collection: Family Assistance Centre (FAC)

The FAC should be activated in the early stages of the BCCS MFI response to facilitate the AM data collection process and establish a means of communication with the next-of-kin.

The purpose of the FAC is twofold: the collection of AM data on victims that are dead or presumed dead, and communication with the families of the dead or presumed dead, specifically, providing them with updated information pertaining to the victim identification process.

It is of the utmost importance that the FAC location is not near the incident scene or the morgue. It must be in a neutral place where privacy and confidentiality can be insured. Community centres and conference centres are ideal locations for the FAC.

1. Collection of AM Data

- a. The BCCS will not begin collecting AM data from next-of-kin or families until a valid and reliable list of missing or presumed dead victims is available from law enforcement. Once this list is compiled, it will be verified jointly between the police of jurisdiction and the BCCS. The BCCS will thereafter create formal AM files and file them alphabetically; BCCS file numbers will not be assigned.
- b. INTERPOL (2009) DVI Guidelines state that in recent disasters, the number of reported presumed victims (missing) exceeds the actual number of victims involved (deceased) by a ratio of 10:1. For this reason, it is important that law enforcement, having jurisdiction to investigate missing persons cases, assist in narrowing this pool of missing persons by verifying or disproving the actual total number of missing persons; these efforts will result in a systematic reduction of the presumed number of victims (INTERPOL, 2009, p. 19).
- c. Per the UK Cabinet Office, National Recovery Guidance—Humanitarian Aspects, Mass Fatalities, a casualty bureau is activated when a MFI occurs. This type of process is needed in BC but does not currently exist. It is not within the legislative mandate of the BCCS to investigate missing persons cases; the investigation of missing persons cases traditionally belongs to and lies with local law enforcement agencies.
- d. As stated in the *National Recovery Guidance: Humanitarian Aspects: Mass Fatalities*, “The purpose of Casualty Bureau is to provide a central contact and

information point for all records and data relating to persons who have, or are believed to have, been involved in an incident” (Cabinet Office, 2011, ¶ 27). The BCCS would rely on this type of process to have a reliable list of presumed dead victims compiled. The four main tasks of a Casualty Bureau, which in the UK is facilitated by law enforcement, are to

- Inform the investigation process
 - Trace and identify people involved in the emergency
 - Reconcile missing persons
 - Collate accurate information (Cabinet Office, 2011, ¶ 27).
- e. BCCS would rely upon law enforcement to complete the aforementioned tasks by
- Taking the initial missing persons reports and recording all relevant information,
 - Creating a list of missing persons and collating the data to produce a reliable list of those believed to be, or presumed dead,
 - Assisting in the identification of those involved in the MFI, and
 - Liaising with the BCCS AM data collection and FAC groups (Cabinet Office, 2011, ¶ 28).
- f. Once the reliable list of presumed dead victims is provided to the BCCS FAC, with the accompanying data gathered by law enforcement, AM data will be formally compiled per the 2009 INTERPOL DVI standards.

Note: If applicable, it is vital to quickly identify any suspects from victims.

- g. The FAC will have trained staff present to interview next-of-kin and family members and obtain vital information that may help establish identification of the victim.
- h. The FAC will have trained staff present to facilitate DNA collection, either family reference samples or personal effects belonging to the victim.

2. **Communication: Next-of-Kin**

- a. Family concerns and religious and cultural considerations need to be addressed consistently. The FAC is a place where family members can safely voice their concerns to the BCCS about the identification process. Ethical considerations may arise and should be addressed promptly by BCCS FAC staff.
- b. It is incumbent upon the BCCS to provide the next-of-kin and family members with regular and timely briefings. This may initially be every two hours, then change to once a day, then perhaps once a week, for example. It is critical that families are kept apprised of identification efforts and progress. These FAC briefings are conducted in the absence of media and are ideally provided by the chief coroner or designate.

H. Post-Processing Transportation and Storage

After human remains have been processed in the morgue, they are escorted back to the designated storage facility (e.g., refrigerated truck or hospital morgue storage) and formally signed back in for continuity purposes.

As the remains are identified, the human remains in storage should start to be separated based on whether or not they are formally identified. Unidentified human remains cases will remain in the possession of the BCCS and remain in storage until such time that they are positively identified; this may take weeks, months, or even years.

I. Reconciliation and Identification

The reconciliation team is tasked with comparing the AM and PM findings that are submitted by the teams at the morgue and the FAC. If a computer program or tool is available to perform initial evaluations, the process will be more efficient. If not, all preliminary matches must be done by hand.

Potential matches are made when criteria from the AM and PM files reveal consistencies or similarities; these may be related to primary (e.g., dental, prints, DNA) or secondary (e.g., tattoos, scars) identifying features.

The basic procedural approach for reconciliation, per INTERPOL DVI guidelines, includes the following steps:

- Collection/review of AM and PM findings
- Collective classification (e.g., using useful criteria such as gender and age to classify)
- Preparation of a list of AM key markers and PM key markers
- Recommendation for identification (first matching)
- Individual comparison
- Verification by second member or team
- Identification/rejection with report to Identification Board (INTERPOL, 2009, p. 42)

The reconciliation team most often includes a coroner (IDRU), DNA analyst, forensic dentist, and/or a fingerprint analyst.

J. Body Release and Disposition

1. Identified human remains should be repatriated back to their country of origin and/or to the legal next-of-kin. After identification is established, the body will be formally released by the coroner. Precursor coroner duties to be performed prior to formal release include the following:
 - a. The coroner must complete and sign the Coroner's Medical Certification of Death.

- b. BCCS must conduct the last verification check (file data against physical remains). This quality assurance measure ensures the correct bodies are being released to the funeral homes. There is no room for error.
 - c. The coroner will advise the legal next-of-kin of the formal release of the body. The funeral home selected by the family will liaise with the BCCS and complete the legal Registration of Death (for the BC Vital Statistics Agency). The funeral home will thereafter pick up the remains from the designated storage facility and transport them back to the funeral home for burial, cremation, or embalming (in the event the remains need to be shipped to a different province or country).
 - d. The coroner is responsible for completing a shipping certificate to authorize the body to be transported out of province.
2. Special arrangements may have to be considered if there are human remains that have been identified but not claimed by the next-of-kin. The Public Guardian and Trustee of BC may be contacted to assist in repatriation and disposition efforts.

Likewise, if there exists common tissue (human tissue not analyzed), special provisions for disposition, in consultation with all of the families, should be considered.

3. If the human remains, whether unidentified or identified, are contaminated to the extent that the BC Ministry of Health, Provincial Health Services Authority, and/or the BC Ministry of Environment has deemed it unsafe to repatriate the remains through the traditional means (e.g., if burial and/or cremation are not possible), alternate arrangements may have to be sought. This would be in consultation with the appropriate authorities, BCCS, and next-of-kin representatives. Cultural representatives may also need to be engaged.
4. Providing the BCCS's burden of proof has been satisfied and if no human remains have been recovered but death was imminent for the victims, the chief coroner, per the Coroners Act (2007), may exercise his or her discretion and issue coroner's medical certificates of death based on presumptive death.

K. Personal Effects Management

If the fatalities are due to a transportation incident (land, sea, or air), the personal effects of the victims must be recovered, collected, catalogued, stored, and eventually returned to the legal next-of-kin. This function is historically the responsibility of the lead death investigation agency: the BCCS or, in the event of a criminal incident and evidentiary purposes, the police of jurisdiction.

Major airline companies may have the means to assist with personal effects management. Private companies (e.g., Kenyon International) are also available to contract out services and perform this task. It is reasonable to assume that the BCCS may request provincial assistance (e.g., from a PREOC) to locate a suitable facility for the cleaning, cataloguing, and storage of personal effects from a MFI.

L. Data and Records Management (Victims)

It is important that all records from a MFI are initially kept separate from daily BCCS casework. All AM and PM records per the INTERPOL standards are considered as evidence, and for this reason, a strict documentation process is required to establish and maintain continuity of record. All records must be signed in and out of their respective stations. Once the records are received from the morgue and FAC, they will be housed centrally at the Office of the Chief Coroner.

M. Data and Records Management (Finance/Administration)

It is critical that all expenses incurred by the BCCS are documented fully. Expenses may include but are not limited to staff pay and overtime, equipment, resources, facilities, forensic specialists, travel, and accommodations. Daily work logs and attendance sheets for each site and function should be maintained. There generally should be scrupulous tracking (logistics) of all purchasing. If a task number has been obtained, then all data and records pertaining to finance and administration would be forwarded to the appropriate PREOC. Reimbursement to the BCCS is ideal but not guaranteed.

N. Public Information and Media Management

Prior MFIs have demonstrated that the public and the media demand information from the respective coroner or medical examiner agency. This may include such details as number of fatalities, number of victims identified, projected length of operation, and operational strategy regarding the fatality management response.

It is imperative that there is control of the media strategy by those in charge of the incident. This includes before, during, and after BCCS response. If the MFI involves foreign nationals, the media strategy also needs to include the central dissemination of information to other countries that may have had victims die in the incident. Messaging to these different countries and to the families within these countries must be consistent.

It is preferable that a joint information group or similar integrated group involving the Public Affairs Bureau be established at the outset of the MFI incident. That way, the BCCS is enabled to report information through one consistent channel. The BCCS information officer will be responsible for collating daily (and sometimes more frequent) statistics and relevant information to the designated communications group. It would also be advantageous to have a BCCS liaison inserted in this group to facilitate clear communication lines between the information group and the BCCS information officer.

In the absence of an integrated provincial communications plan or integrated communications group, the BCCS will designate a BCCS representative to speak directly to the media regarding the information and details prepared by the BCCS information officer. In some cases, it may be pertinent to have the chief coroner or designate speak directly to the media to maintain public trust with respect to the identification process. It is important to

remember that dealing with society's dead is a sensitive issue with the public and must be handled carefully and with transparency.

X. Identification and Mass Disposition

A. Identification of Victims Before Disposition

International ethical practice in fatality management advocates that human remains be formally identified prior to disposition. This is consistent with both WHO and PAHO. Neither burial nor cremation should occur prior to the establishment of the identity of the person(s). This is irrespective of the number of fatalities involved in the incident.

B. Mass Disposition of Human Remains

Because of the existence of modern refrigeration resources such as reefer trucks, morgue facilities, and funeral home facilities (and warehouses with refrigeration capability), mass burials are not contemplated unless as an absolute last resort.

If a situation arose where mass burial would be contemplated, then it would be done so systematically with proper documentation and exhibit-control procedures in mind. There would also be a geospatial record indicating the specific physical locations of the bodies contained within the greater burial.

Public community ice rinks are not to be used unless as an absolute last resort. The stigma associated with the use of these local facilities may permanently mar and have severe psycho-social effects on a community.

C. Epidemic Outbreak Myth

PAHO and WHO have produced a report which scientifically refutes the common public misconception that decomposing human remains pose a health risk to the living. The risk of transmission from a dead body to a live person is negligible:

The presence of dead bodies cannot be considered a significant public health threat. The reason dead bodies pose such a limited health threat is that as the corpse desiccates, the body temperature drops quickly. Even the most resistant bacteria and viruses die quickly in an animal that has died recently. This makes it extremely difficult for microorganisms to transfer from dead bodies to . . . human populations. (PAHO & WHO, 2004, p. 74)

Regarding epidemics, PAHO and WHO stated,

The only thing we can definitively say about dead bodies in disease endemic areas is that they can be carriers of the etiologic agent, without their being the cause of epidemics. Scientific research has not been able to link the presence of dead bodies as the cause of an epidemic in any of the recent disasters or in situations with a great number of fatalities. (PAHO & WHO, 2004, p. 73)

It is important to recognize that most victims of disaster die from blunt force traumatic injuries and not from disease.

XI. BC Coroners Service Regions

A. Office of the Chief Coroner

800-4720 Kingsway
Burnaby, BC V5H 4N2
Main: 604-660-7745

B. Vancouver Metro Region

800-4720 Kingsway
Burnaby, BC V5H 4N2
Main: 604-660-7708

C. Fraser Region

401-10470 152nd St
Surrey, BC V3R 0Y3
Main: 604-930-7134

D. Interior Region

103-1420 St. Paul St
Kelowna, BC V1Y 2E6
Main: 250-861-7429

E. Northern Region

440-1011 4th Ave
Prince George BC V2L 3H9
Main: 250-565-6040

F. Island Region

202-780 Tolmie Ave
Victoria, BC V8X 3W4
Main: 250-952-4150

XII. Provincial Emergency Program Offices

Office locations and contact numbers: Go to http://www.pep.gov.bc.ca/about_pep/offices.html

Emergency contact number: Contact the Provincial Emergency Coordination Centre (Victoria, BC) at 1-800-663-3456.

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Survivorship and Presumption of Death Act, R.S.B.C. 1996, Chapter 444.

XIV. Appendices

A. BCCS Pandemic Annex

Pandemic Influenza Outbreak: Caring for the Dead

1. Introduction

The BC Ministry of Economic Development has estimated that there could be between 1,800 and 4,300 deaths in BC during the course of a pandemic influenza outbreak. These deaths will occur throughout the province and will be most frequent during the two to three *waves* of infection that have been seen in previous pandemics (the first wave lasting approximately six to eight weeks and peaking at three to four weeks, the second wave occurring approximately three to nine months after the first wave, and the potential for a third wave extending beyond the one-year mark).

To put this number of deaths into perspective, the BC Vital Statistics Agency reported that there were 31,107 deaths in British Columbia in 2007. Pandemic influenza deaths at the lower end of the predicted clinical attack rate (15%) would represent a slight increase above the normal annual death rate and would place only a slight stress on systems currently in place to care for the dead. The higher end of the clinical attack rate (35%) represents an observable increase in the annual death rate and would have a significant impact upon resources (BC Ministry of Economic Development, 2006).

BC currently has a relatively efficient system in place to look after those who die. Approximately 76% of deaths occur as a result of natural disease processes wherein the individual is well-known to a physician, and that physician is able to sign a death certificate indicating a reasonable cause of death (BC Coroners Service, Ministry of Public Safety and Solicitor General, 2008). If the death is expected and occurs at home, a funeral home can pick up the body directly from the home or from a hospital. If the body

was moved to a hospital morgue for temporary storage, family members can make arrangements with a funeral services company to transfer the body to a funeral home. Likewise, if the death occurs in a hospital, the body will be held, usually in a refrigerated space (although many rural hospitals do not have refrigerated body storage areas) until arrangements can be made by a family member to transfer the body to the respective funeral home.

Section 2 of the BC Coroners Act (2007) details which deaths are reportable to the coroner. Reportable deaths, generally, can be as a result of violence, accident, negligence, misconduct, malpractice, self-inflicted injury, or illness. Reportable deaths can also be sudden and unexpected (e.g., persons who were in apparent good health and not treated by a medical practitioner), as a result of disease, sickness, or unknown cause (for which the person was not treated by a medical practitioner), or during pregnancy (or following pregnancy in circumstances likely attributable to pregnancy).

Only a coroner can sign a death certificate in the aforementioned, prescribed circumstances. There are other unique circumstances within Section 2 that are not mentioned here.

In the event of a natural death that does not need to be reported to the coroner (e.g., if the death is not reportable under Section 2 of the BC Coroners Act, 2007), an autopsy may take place if the decedent's physician obtains permission from the next-of-kin. Conversely, if the physician does not know the underlying cause of death, the death must be reported to the coroner, who is responsible for conducting an investigation and for certifying the cause of death. Once the investigation is complete, the chosen funeral home can pick up the body from the hospital. Throughout BC, the final disposition of the body, whether by burial or cremation, can take place within two to five days of the death in most cases.

During the course of a pandemic influenza outbreak, the same system and resources will be used; however, accommodations will have to be made for the increased number of deaths. Body transportation, body storage, delays in final disposition of bodies, and actual fear of the body as a source of infection can all be anticipated as major stress points to the current system. The majority of deaths that occur as a direct result of pandemic influenza will not require any involvement by the BCCS; however, in this special setting, the BCCS, which has experience in dealing with multiple fatality incidents, will be available as a resource.

2. Body Transportation

Bodies are normally transported from the place of death to the funeral home of the family's choice. In many cases, bodies are temporarily held in refrigerated facilities at a hospital while a family makes arrangements with a funeral home. Body transportation is either done by funeral homes or, in the case of the BCCS, by body transportation companies. Transportation of bodies by ambulance is not considered to be appropriate at normal times, let alone during a pandemic influenza outbreak when their services will be in constant demand by living patients.

The BCCS will remain responsible for the transportation of all bodies when the death occurs under circumstances reportable under Section 2 of the BC Coroners Act (2007). These arrangements are best made with local funeral homes, but short-term contract body transportation services may have to be created if the number of deaths threatens to overwhelm local resources. The BCCS can be contacted for guidance with respect to which requirements should be considered for the creation of this type of service.

Note: In rural or unserved areas, the BCCS utilizes the local funeral home to transport decedents. If these services are unavailable, the BCCS may be contacted to provide guidance and assist in finding alternate means of body removal services.

3. Body Storage (The "Temporary Morgue")

Until the bodies of the deceased are moved to a funeral home for final disposition, they remain the responsibility of either the local health authority or the coroner. The BCCS (through the Identification and Disaster Response Unit) may be asked to assist in the creation of a "temporary morgue," implying that this is a facility for the storage and examination (e.g., by autopsy or external examination) of human remains. In reality, all that is needed is a body storage facility. This facility must be refrigerated to a temperature of 4°C in order to slow the onset of decomposition until the body is taken to a funeral home. It should be assumed that whereas temporary storage of a body is normally only necessary for a period of one to five days, storage for three to six weeks might be the norm in a pandemic influenza setting (see below). Decomposition will start after a period of several days, even at temperatures of 4°C, and it will have to be accepted that this will happen in spite of any plans that are made for body storage.

The combined total capacity of all hospitals throughout BC for refrigerated storage is estimated to be less than 300 bodies; many smaller rural hospitals may not have any refrigerated body storage space. It is clear, therefore, that there will be a shortage of refrigerated body storage sites province-wide; however, the acuity of the shortage will

vary from location to location and in accordance with the stage of evolution of the pandemic.

Apart from hospital morgues, there are three potential sources of additional refrigeration for bodies: commercial refrigerated tractor-trailer units, local industries and government offices with refrigerators, and local ice arenas. The most practical of these alternatives is the temporary rental of refrigerated tractor-trailer units, as these can be placed at a hospital where there are already procedures in place for the admission and release of bodies.

Although difficult to predict, it is unlikely that the majority of the rural health regions would need more than one of these units for the temporary storage of bodies. Without shelves, these units can hold approximately 25–30 bodies each. The construction of temporary wooden shelves, of sufficient strength to hold bodies, will increase the storage capacity; however, the shelves must be constructed in a way that allows for safe movement and removal of bodies (e.g., storage of bodies on shelves above waist height is not recommended for safety reasons). Care must be taken to avoid using a trailer that would create negative implications in the media or community or for the company providing the unit (e.g., a marked unit from a grocery chain).

Admission and release procedures as well as provisions for security of the tractor-trailer units will have to be planned for and enforced. The next best option would be to use a Government of British Columbia local office with cold storage. Local industry refrigerators and local ice arenas are not recommended, primarily because their locations are fixed and the postpandemic implications of the fact that human bodies had been stored in these sites can be very serious. They should be considered only as a last resort, although use of this type of facility may be necessary in the larger population centres of BC.

4. Autopsies and Handling of the Bodies of Those Who Have Died of Influenza

There is no requirement for an autopsy to be performed simply because someone is thought to have died as a result of influenza. For epidemiologic purposes, it will be preferable that a clinical and serological (blood or other bodily fluids) diagnosis of influenza is made; however, an autopsy, per se, will not resolve the question of whether a person had influenza. The diagnosis is made serologically by the collection of 8 to 10 ml of blood in a red-stoppered tube (from a subclavian puncture if collected postmortem), which is submitted to a laboratory designated for disease surveillance in the existing Provincial Pandemic Influenza Plan. Permission would have to be obtained from the next-of-kin to collect this specimen postmortem if serological confirmation of a diagnosis of influenza is deemed appropriate. If a physician would like an autopsy performed,

permission for this will have to be obtained from the next-of-kin as per normal protocols. In cases where the death is reportable to a coroner, the decision as to whether an autopsy is to be performed is solely that of the coroner and is based primarily upon answering legal questions rather than medical questions.

All individuals who handle the bodies of those who have died of influenza should use universal precautions. These precautions are known to and are currently used by all health care and funeral home professionals, and do not require any special adaptations in a pandemic influenza setting. The actual risk of influenza infection spreading from the body of a deceased individual is minimal, with the primary precaution against disease spread being the prevention of exposure to splashes or aerosols of body fluids.

5. Final Disposition of Bodies

In normal circumstances, memorial services and funerals can be held within two to five days of a death. In a pandemic influenza setting, the funeral service industry will suffer from the same increased demand for services and the same staff and supply shortages that other industries will experience. As a result, it should be anticipated that the elapsed time between death and final disposition of the deceased could be greater, particularly during the most acute phases of any of the influenza waves. This will be disturbing to the next-of-kin, particularly those whose religious beliefs place strict timelines on caring for the dead; however, these delays will be virtually unavoidable.

It should be noted that there is currently no intention in BC to resort to mass burials or mass cremations in order to accommodate the increased numbers of deaths arising from a pandemic influenza outbreak. This would be considered only in the most extreme circumstances.

6. Major Points for Consideration

- The majority of deaths caused by influenza will not occur under circumstances that involve the BCCS, and regional health authorities will therefore have to make plans to accommodate the increased number of anticipated deaths during a pandemic influenza outbreak.
- The bodies of those who have died from influenza should be handled using universal precautions currently employed by health care professionals and the funeral home industry. The actual risk of spread of influenza from a deceased individual is minimal.
- Temporary body storage in local industrial refrigerators or local ice arenas (e.g., hockey and curling rinks) is not recommended except under extreme circumstances

(e.g., larger population centres such as Vancouver and Victoria), and careful consideration will have to be given to the postpandemic implications of the storage of human bodies in these sites.

- There will be no requirement under the BC Coroners Act (2007) for autopsies of those persons who have died of influenza. Autopsies will be done, with permission from the next-of-kin, in those cases where a physician requests one, as per nonpandemic protocols. In those deaths investigated by a coroner, per Section 2 of the BC Coroners Act, the decision as to whether an autopsy will be conducted lies solely with the investigating coroner.
- Funeral services might be delayed for a few weeks following death. In spite of this, there is currently no intent to resort to mass burials or mass cremations.
- The BCCS can be contacted for advice and guidance on any issues arising from increased numbers of deaths in health regions during a pandemic influenza outbreak.
- From a medico-legal perspective, persons identified as having been infected by influenza should be made identifiable in an appropriate manner (e.g., a database) to first responders, health care professionals, and secondary responders (such as coroners and body removal services) for health and safety reasons.

Acknowledgment: Alberta Office of the Chief Medical Examiner for providing the framework for this pandemic annex.

B. DVI BC Task Force

British Columbia Coroners Service Disaster Victim Identification (British Columbia) Task Force

1. Background

In the event of an incident involving mass fatalities, the BCCS will respond in the same manner in which it responds to individual deaths. This involves conducting an investigation to determine the identity of the decedent, in addition to where, when, how, and by what means the individual died. The BCCS is also responsible for classifying the death (accidental, homicide, natural, suicide, or undetermined) and making recommendations to prevent future deaths in similar circumstances.

The Identification and Disaster Response Unit (IDRU) is responsible for the coordination of disaster and mass fatality response for the BCCS. This includes all aspects of planning, research, as well as training and development. It also includes internal and external communications that are in concert with BCCS stakeholders.

Under the direction of the chief coroner and in accordance with the BC Coroners Act (2007), the IDRU was tasked with developing a professional DVI BC task force based on established DVI and ICS principles and practices.

2. Disaster Victim Identification (DVI)

INTERPOL's *Disaster Victim Identification Guide* is based on practical experience gained from actual incidents. It emphasizes that DVI is a difficult and demanding exercise, which can be brought to a successful conclusion only if properly planned (INTERPOL, 2009). The identification procedures described in the guide can be adopted by different agencies and used in all circumstances, irrespective of the number of victims involved. This guide will be instrumental in assisting the BCCS to fulfill its mandate, specifically in mass fatality incidents.

The guide reflects lessons learned from many worldwide disasters as well as recent developments in identification technology and techniques.

The guide is intended to contribute to the efficiency and effectiveness of disaster handling in general and of identification procedures in particular. It is also designed to encourage the compatibility of procedures across both national and international boundaries.

3. Incident Command System (ICS)

The ICS was developed in the 1970s following a series of catastrophic fires in California. The effects of the fires were widespread and resulted in property damage, injury, and death. Personnel assigned to investigate and evaluate the response to this particular

disaster (as well as other similar incidents) discovered that response problems could rarely be attributed to lack of resources or failure of tactics. More than any other single reason, issues surrounding response were attributed to inadequate management and command structures.

The ICS is a model for command, control, and coordination of emergency response at an emergency site. It provides a way of coordinating the efforts of agencies and resources as they work together towards safely responding, controlling, and mitigating the emergency incident.

4. Mission

Under the direction of the chief coroner, and in accordance with the BC Coroners Act, develop a professional DVI BC task force and enhance the pre-existing BCCS *Disaster Response Manual* based on established DVI and ICS principles and practices.