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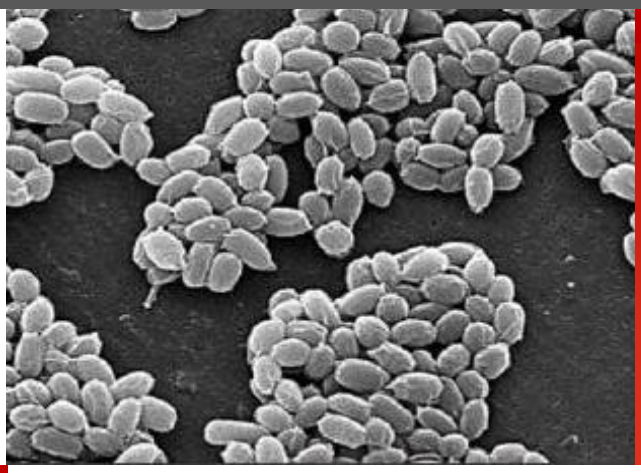

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RGI

The Regulatory Governance Initiative (RGI) at Carleton University builds on the proven track record of Carleton's *School of Public Policy and Administration* to develop regulatory capacity and competence through research, education, and dialogue. Its scope is regulatory policy, governance, and management. Its approach is holistic and problem-driven. The RGI assembles expertise from the humanities, social and natural sciences as needed.

Bioterrorism and Occupant Management: Knowledge Gaps and Policy Challenges

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A Discussion Paper

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"Bioterrorism is the use, or threat of use, of biological agents to negatively affect the health of a population; the objective is to instil fear and disrupt the normal functioning of a society or culture.[1] Terrorists may use biological agents because they can be extremely difficult to detect and do not cause illness for several hours to several days."[2]

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I. Introduction

In September and October 2001, at least five envelopes containing ***Anthrax*** spores were mailed to two American Senators and to members of the media in New York City and Boca Raton, Florida.

As summarized in the report of the Trust for America's Health and the Robert Wood Johnson Foundation (2011), as a result of this ***bioterrorist attack*** 22 victims contracted *Anthrax*, with 5 people dying from the infection, 31 people tested positive for exposure to anthrax spores, and 10,000 people were deemed at risk from possible exposure. In all, 35 post offices and mailrooms were contaminated along with seven buildings on Capitol Hill in Washington, D.C. The investigation included over 600,000 investigator hours, 10,000 witness interviews, 80 searches and over 6,000 pieces of evidence. In addition, there were 5,750 federal grand jury subpoenas issued and 5,730 environmental samples collected from over 60 sites. The investigation itself cost $100 million however the overall economic cost was over $1 billion.

Over the past 10 years much effort has been spent developing sophisticated plans covering the investigation and management of similar incidents and new laws have been passed. In Canada, various agencies of the Federal Government of Canada have worked closely with their Provincial counterparts and with officials of large municipalities to develop a framework for cooperation during an incident. Yet a recent Chatham House (UK) report, "Preparing for High Impact, Low Probability Events", found that governments and businesses remain unprepared for such events (Lee, Preston, and Green, 2012). The authors noted that risk scenarios should be built into generic response capability, that stakeholders should plan for communicating taking into account both traditional and social media, and that scientific advice is key for the response. However, they argued that uncertainties involved are generally not characterized (or known) and conveyed to decision makers. As a result, how that advice is coordinated, translated into a set of concrete actions, and communicated to the public in a fast-evolving crisis is a key challenge.

> *Anthrax is an acute infectious disease caused by the spore-forming bacterium Bacillus anthracis. Anthrax most commonly occurs in wild and domestic mammalian species (cattle, sheep, goats and other herbivores), but it can also occur in humans when they are exposed to infected animals or their tissue or when anthrax spores are used as a bioterrorist weapon.*[3]

Guidance for evaluation, extent of testing, and remediation of particulate infectious agents in contaminated buildings is needed. It is important to accept that the guidance will be consensus driven taking into account social, economic and environmental information and not based exclusively on a scientific foundation. Government officials, construction workers and occupants need to be given training to allow them to respond to available information about real and perceived risks of disease before, during, and after the cleanup. We know that not everyone will accept the decisions that are made and a process of social consent is essential to minimize initial and lingering concerns.

In order to address some of the policy challenges and the knowledge gaps related to the design and implementation of these guidelines, the Regulatory Governance Initiative (RGI) at Carleton University decided to hold a Critical Conversation™ on the issue of Occupant Management and Re-occupancy of buildings after a bioterrorist attack. More specifically, the event has been organized to answer what is the top policy priority/action required to address each of the three following challenges:

Critical Conversations™ bring together people with different perspectives, experiences and responsibilities – people who are leaders and bold thinkers in their respective fields, but who are not often in the same room together and even more rarely talk to each other in a safe haven. They aim to contribute to more informed debate and better, evidence-based policy and regulation. Chatham House rules apply.

1. ***Ensuring that we have the scientific and technical capacity to deal with each of the critical aspects of a bio-terrorist event;***
2. ***Ensuring that roles and responsibilities are known, understood, and practical;***
3. ***Ensuring the achievement of social consent throughout the entire process, concluding with the re-occupancy of the decontaminated building***

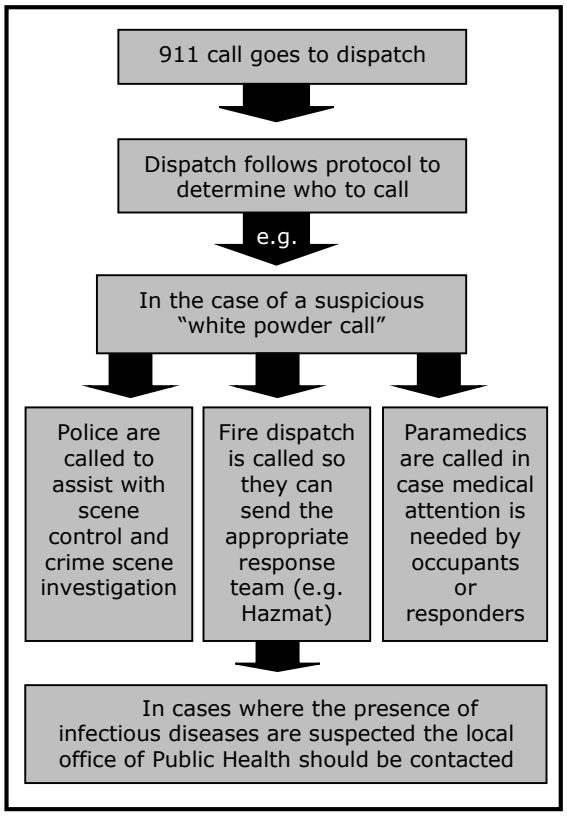
The objective of this position paper is to get all the participants on the same page and to focus the discussion on the issues that are of greatest interest to practitioners. The threat scenario under consideration in this paper is that an envelope has been opened in a public building in Canada containing a powder of unknown origin. From the moment of realization by the individual opening the envelope that this could be a potential bioterrorism attack, there are a great number of critical, interweaving and complex factors that must be taken into consideration to reduce the possibility of a negative public health outcome to the extent possible.[4]

This paper proceeds in two parts outlining two aspects of emergency management in Canada, and identifying the key challenges that should be further studied and addressed. Section II outlines some of the operational issues related to the response to a bioterrorist emergency from the notification via a 911 call through the re-occupation of the affected building. Section III focuses on the governance aspect of emergency management by looking at who in the government has the mandate to be involved and what are they roles and responsibilities.

II. Emergency Response in Canada: Operational Issues

a. Dispatch/Notification

For suspicious powders, or situations with occupant symptoms, it usually starts with a 911 call.

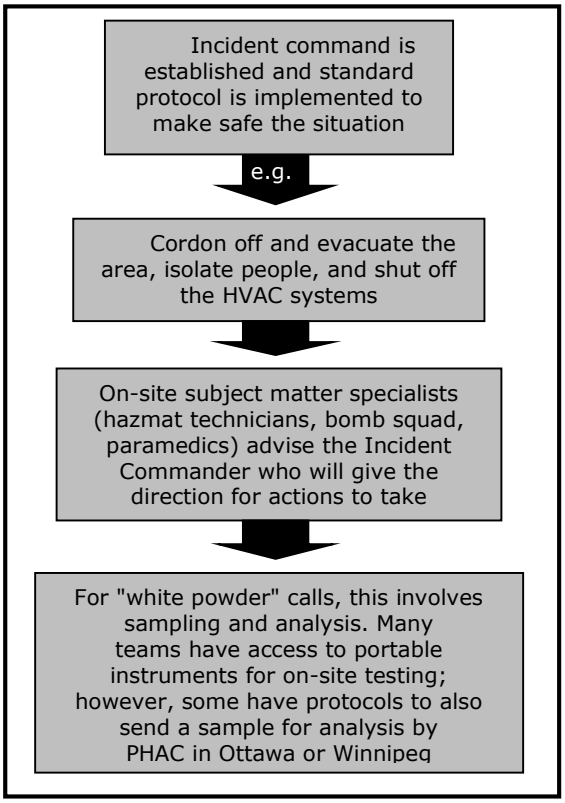


The goal of the dispatchers is to get the appropriately trained and equipped individuals on site. There may be variations in who gets sent out depending on where it happens in Canada, the

locally-available resources, the jurisdiction of the police force, etc. There is always the concern that the correct people, groups, or agencies will be notified considering the constant challenge of employee turnover.

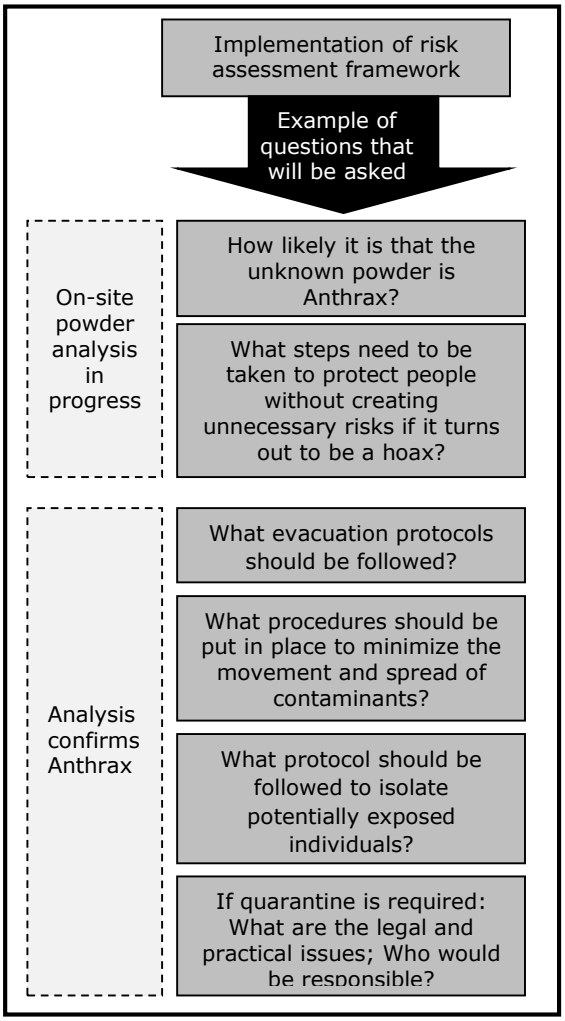
b. *Inmediate On-Scene Response*

First responders will establish incident command, to determine what actions to take. In the case of suspected bioterrorism this first intervention and its timing are crucial and can determine the outcome for the occupants, the first responders, and the wider community.[5]



c. *The Risk Assessment*[6]

One of the critical requirements for decision making during an emergency is the existence of a *Risk Assessment and Emergency Management Framework*. This framework has to be in place before it is needed and should be well understood and supported by all of the parties. In order to validate the potential effectiveness and efficiency of the framework simulation exercises should be conducted.[7]



According to PSC (2011), risk assessment as part of an emergency response involves:

- ongoing hazard analysis (threat and vulnerability analysis) and probability assessment;
- determination/analysis of mitigating or aggravating factors;
- impact analysis on critical infrastructure sectors;
- risk analysis; and

- recommendations to decision makers.

If the presence of a biological agent, such as Anthrax, was confirmed, the event would be classified as threat to national security and it would fall under federal jurisdiction. In this case the Royal Canadian Mounted Police (RCMP) national CBRNE Team could take command of the incident and transition from the local first responders who were at the scene.[8]

***CHALLENGE**: Accounting, mitigating, and taking advantage of the impact of Social Media*

- Considering that constraining the use of social media during an emergency is both impractical and, potentially, illegal (Kreimer, 2011) how do we mitigate its potential negative impact?
- How should social media be used to communicate with stakeholders, monitor public opinion, and establish social consent?

Framework? Does it matter?

- How can we further our understanding of how the process evolves in real life from the 911 notification of a threat to the implementation of the Federal emergency management plan?
- Does the existing framework establish the required linkages from the incident command to the city, provincial, and/or federal operations' centres?
- Are all the involved agencies and departments aware of their various roles and responsibilities? Do these roles and responsibilities need to be defined and agreed upon?

A relatively unexplored variable, which should be taken into consideration in the risk assessment and through the implementation of the emergency management plan, is the influence of social media and its impact on emergency situations. With the advances of technology, social media has risen in importance as a mitigating factor that can have both positive and negative impacts during, and long after, and emergency.

On the positive side, for example, "there is a lot of potential for social media to really explain risks in ways that people can understand, to try and explain the science and factual information in a medium or form and style that the public are able to understand and relate to" (Adrian Moss, as quoted in Gray, 2011). In addition, social media provides a valuable source of information for crisis managers who can follow the feedback of how stakeholders are picking up the message, and how it is being relayed in the community.

Social media and the London Tube bombing

A review of the impact of social media during this emergency found that "stranded victims turned to their camera phones and recorded the horrific scene […] and in moments the images arrived at photo-sharing websites, personal e-mail addresses, and eventually, the front page of the BBC News website and The New York Times" (Borenstein, 2009). This process brought "alternative information, perspectives and ideological critique in a time of national crisis" (Allan, 2007).

On the negative side, as made evident during the London Tube bombing, in "crisis situations, officials often need time to put together accurate information causing delays in communications. In that delay all sorts of

rumours and misinformation can be passed around [through social media] making it very difficult for stakeholders to find the right source of information" (Adrian Moss, as quoted in Gray, 2011).

d. The Evacuation and Occupant Management

Once first responders are on the scene, knowing what to do with occupants is not always clear, especially when they wish to leave. While, in theory, the implementation of the risk assessment and management framework should help with occupant management there are still many difficult practical questions that should be further study and answered.

When the situation has been evaluated First Responders need to make a decision regarding whether a complete or partial evacuation is warranted. This decision will be based on the specific situation and the potential threat to occupant safety.

One mitigating factor that must be considered is that as safety is threatened, fear contributes to, and can ultimately control many aspects of human behaviour. For example, fear and its impact on crowd behaviour could result in rescue authorities being confronted with "crowd stampedes."[9] People rushing or stampeding to exit a building to escape a bioterrorism agent could result in serious injuries or even death.

Unless the evacuation strategy is well thought out, the people who may have become contaminated directly or during the evacuation could potentially spread the infectious agent into the community, including public transport. A recent analyses of this problem identified risk perception, life circumstance, and the opinions of influential friends and credible public spokespersons as influential in determining compliance with an evacuation order (Manuell & Cukor, 2011).

If a quarantine order is required there are a number of ethical challenges that must be addressed. In these situations "decision makers are required to balance individual freedoms against the common good, fear for personal safety against the duty to treat the sick, and economic losses against the need to contain the spread of a deadly disease" (PHAC, 2003).

e. Remediation

Once the situation is rendered safe and first responders have done all they can, they leave the site. If they are able to determine it is safe for re-occupancy, they do so; otherwise they building would be locked down until the RCMP's investigative work related to the crime scene was completed. After completion, the building would presumably be turned over to the appropriate authority for remediation.

***CHALLENGE**: Successfully dealing with the occupants*

- How to ensure that occupants are familiar with the emergency evacuation procedures and routes?
- What are the knowledge gaps in the understanding of barriers to compliance with orderly evacuations?
- How can first responders know if someone who already left has been exposed?
- How can first responders prevent potentially contaminated individuals from spreading the infectious agent?
- How do you keep potentially contaminated individuals from overwhelming the medical

If it is deemed that the building merits remediating, decontamination following an act of bioterrorism becomes imperative to regain not only the use of the facility, but also the occupant's confidence. The complexity of this type of clean-up operation is such that it demands extremely specialized procedures, meticulously carried out with a high degree of oversight, presumably by the designated competent authority.[10]

***CHALLENGE**: Successfully remediating the contaminated building*

- Who is financially responsible for the clean-up?
- How will the ownership of the building, i.e. public vs. private ownership, impact the process? Should it impact the decision-making and remediation process?
- Who is responsible for ensuring that the cleanup takes place?
- What method for cleaning should be used?
- How can the effectives of the cleanup be determined?
- Who is responsible for establishing that the build-back and re-occupancy

well-trained people saves lives and that local public health agencies can play a critical role (Toner and Nuzzo, 2011).

There are 3 steps involved in the remediation of a site contaminated with a biological agent of terrorism:

- ***Characterization:*** during this phase samples are collected to determine the presence of the biological agent and to characterize the extent and levels of contamination.
- ***Decontamination:*** this phase involves the removal or inactivation of the biological agent from all contaminated environments or surfaces. Depending on the scale of contamination, the decontamination of a building may take weeks, months or years to complete, and it is an expensive process.
- ***Clearance:*** this is the final phase before the facility or area can be re-inhabited. Criteria would be necessary so that measurements could determine if the decontamination process was successful.

Experience with other building contaminants (e.g. Legionella) have demonstrated that clear communication about the nature of the contamination and the process of decontamination to all stakeholders (affected and non-affected) is a critical factor for achieving social consent. Messaging this information properly will determine how people will respond to the invitation to use the facilities again. As it was previously explained, social media should be an important consideration.

The answers to these questions and the responsibilities inherent in them need to be clearly articulated in any legislation, regulations, and/or guidance documents related to the remediation of premises following this type of attack.

f. Reoccupation

Reoccupation of a once contaminated premise, although one might expect it to be a seemingly simple process as compared to characterization and decontamination, is fraught with potential complications. For example, based on the biorestoration activities from the US anthrax attacks in 2001, we know that it could easily take up to 2 years to have a building declared safe for reoccupation. At the same time we should recognize that if the facility was critical infrastructure, such as an airport terminal, there will be extreme pressure to act immediately.

Part of the problem, as explained in the report of the American National Research Council (2005) on the issue of reopening public facilities after a biological attack, is that the question of when a facility is safe for reoccupation cannot be answered with physical data alone. As the report argues:

> "Science provides highly sophisticated tools that help diminish uncertainties and, despite those uncertainties, help policy makers map out possible courses of action. However, the issue of safety goes beyond numerical calculations. The perception of what is safe ultimately depends on whether people believe what the technical experts and policy makers say about safety. The question, 'How clean is safe?' is the same as, 'What level of risk is acceptable?' Thus, if we are to build sensible policy recommendations, the physical and life sciences must work hand in hand with the social sciences" (National Research Council, 2005, pg.56).

As a result, "an official declaration that a building is safe for reoccupation is meaningless if the occupants and other stakeholders do not perceive it as safe. […] Conversely, the expert appraisal of a building as not yet safe for occupation may be out of step with the ideas of building owners and users who are eager to reoccupy a structure. The decision that it is safe to reoccupy a facility hinges on the balance between detection limits and acceptable risk" (National Research Council, 2005, pg.157).[11]

***A successful decontamination project that will lead to a successful reoccupation will require the following*:**

- Removal of the threatening agent to the greatest extent feasible and certification that the property is as safe as it was before contamination occurred.
- Effective leadership based on openness, honesty, and transparency even when bad news must be conveyed.
- The implementation of a consultation process that involves key stakeholders to develop trust and achieve acceptability.
- Stakeholder acceptance of the credibility of those who have certified the safety of the property.

II. Emergency Response in Canada: Governance Issues

a. The Mandate- which government does what

In Canada, at the provincial and municipal governance level, emergency management to ensure public safety is under the jurisdiction of the police, fire and paramedic services known collectively as First Responders. These three services are tasked with seeing that communities are prepared and equipped to respond in a timely and effective manner to any possible emergency. The members of these groups provide their

services primarily at the local level for any threat or hazard.

Depending on the scope of the emergency and potential capacity limitations, First Responders may request assistance from higher levels of government. Each level of government, according to the constitution, has authority to deal with certain specific aspects of emergency management. Nevertheless, with few a exceptions, municipalities will be primary responsible for the emergency response including the provision of the first responders and the public health response team, i.e. medical officers of health and public health nurses.

All provinces and territories have their unique Emergency Management legislation which differs from province to province but essentially covers the *four pillars of Emergency Management: Prevention, Preparedness, Response and Recovery*. They also have an *Office of Emergency Management* (EMO) which plays a critical coordinating role not only within the province or territory but also between the province and the Federal Government, if the province has requested Federal assistance because of the emergency.[12]

***CHALLENGE**: Establishing Social Consent*

- How do we define acceptable risks?
- What strategy should be implemented to ensure that stakeholders accept the official declaration that a building is safe?
- How do we mitigate the eagerness of occupants and/or builder owners to reoccupy while the decontamination has not been completed?

In 1833, the Legislature of Upper Canada passed an Act allowing local municipalities "to establish Boards of Health to guard against the introduction of malignant, contagious and infectious disease in this province." In most parts of Canada, this delegation of public health responsibility to the local level established has persisted to the present day.

At the Federal level, the response to a bioterrorism event is laid out in the Federal Emergency Response Plan (FERP), the Government of Canada's "all-hazards" response plan.[13] This plan outlines the processes and mechanisms to facilitate an integrated response to an emergency and to eliminate the need for federal government institutions to coordinate a wider Government of Canada response. According to the plan, the role that each federal government institution will play will vary according to the scope of the emergency, and they could be classified as Primary, Supporting, or Coordinating departments. The questions of who knows about this amongst the practitioners and whether it would work in real time remain open. With the frequent change in personnel in key positions continuous attention to training, certification and practical understanding is essential.

The FERP also outlines the Emergency Support Functions (ESFs) which provide the mechanisms for grouping functions most frequently used in providing federal support in response to a request for assistance during an emergency. These functions are allocated to federal government institutions in a manner consistent with their respective mandated areas of responsibility, including policies and legislation, planning assumptions and a concept of operations. One or more Emergency Support Functions may need to be implemented, depending on the nature or scope of the emergency. In the case of a bioterrorism event, which could impact the health of the population, the main

support function that would be implemented would be #5, i.e. Public Health & Essential Human Services, under which the primary departments are the Public Health Agency of Canada (PHAC)[14] and Health Canada (HC).[15]

The Federal department responsible for promoting and coordinating emergency management plans, and for coordinating the Government of Canada's response, as previously mentioned, is *Public Safety Canada* (PSC). Because of this, the Minister of Public Safety is responsible for the two Acts that could be invoked in order to respond to a threat of Bioterrorism. Those Federal Acts are:

- ***The Emergency Management Act*** which, among other things, specifies that all federal Ministers are responsible for developing, testing, and maintaining mandate-specific emergency management plans and identifying risks that are within or related to their area of responsibility.[16]
- ***The Emergencies Act*** which defines the four types of national emergencies and the conditions for the federal government to declare a 'state of national emergency.' The four types are: public order, public welfare, international and war.[17]

Role of Federal Government Institutions

- *A primary department (PD)* is an institution with a mandate related to a key element of an emergency. Several federal government institutions may be designated as primary departments, depending on the nature of the emergency.
- *A supporting department* is institution that provides general or specialized assistance to a primary department in response to an emergency.
- The role of *coordinating department* is always assigned to PSC.

[1] Miller-Keane, & O'Toole, M. T. (2005)

[2] CDC (2007)

[3] CDC (2008)

[4] It is recognized that in some cases there may be no noticeable indication of a bioterrorist threat. In this situation no indication will be provided until the onset of symptoms or notification to authorities of the threat.

[5] For example, as Agranovski et al. (2005, pg. 1050) explained, laboratory tests show that it takes less than 6 seconds for the anthrax spores to reach the inhalation zone. This means that the initial movements and activities of the letter recipient can have a major impact on exposure to the individual(s) in the immediate vicinity, the spread throughout the building, and on secondary contamination through the movement of contaminated individuals and/or items. Besides the initial movement of the letter recipient, other factors that will affect the level of contamination include "the geometry of the human, distance to the opening zone, reaction time, recoil velocity, and the amount of microbial material in the envelope" (Agranovski et al. 2005, p. 1054).

[6] These risk assessments would likely be supported by an existing 'All-Hazards Risk Assessment.' As explained by PSC (2010), these assessments are produce thought a systematic approach that concurrently identifies, analyzes and estimates all natural, accidental and malicious threats and hazards. Moreover, they: (a) promote the development of a management structure, processes and procedures throughout the four phases of emergency management that are applicable to every significant identified hazard; (b) help to balance and prioritize risk investments and actions; (c) help to identify interdependencies; (d) promote integration of lessons learned and adoption of a forward-looking approach; (e) support a consistent approach; and (f) enables cooperation.

[7] It should be noted that from time to time high security simulation exercises are carried out in Canada where typically elements of a scenario, such as the response of the first responders to an unknown liquid or solid, are tested; however, it has been very rare in the world to exercise

decontamination of hundreds of contaminated people, or to move beyond the response phase to area decontamination and/or recovery. This is why simulation of low probability high impact events is needed

[8] The RCMP is part of Public Safety Canada (PSC), and has its own National Operations Center.

[9] Krause, J., & Ruxton, G. D. (2011).

[10] Carefully written procedures based on the best available science were developed in the United States following the 2001 anthrax attacks. A useful source of information is, for example, a report produce in 2005 by the Committee on Standards and Policies for Decontaminating Public Facilities Affected by Exposure to Harmful Biological Agents: How Clean is Safe?, National Research Council. The report, entitled "Reopening Public Facilities After a Biological Attack: A Decision-Making Framework," reviews the key factors that influence decision making and lays the foundation for establishing standards and policies for relevant aspects of biological decontamination.

The report finds, for example, that efficiently sampling and characterizing a pathogen is critical for choosing the best remediation strategy. However, it warns against universal standards for deciding when a building is safe to re-enter because varying pathogen amounts and characteristics could require different strategies. The report offers a flowchart for decision-makers that includes questions about the characteristics of the pathogen; how far it has spread; whether it is transmissible between humans; and how long it will survive to pose a threat. The report also recommends that a risk-assessment approach be adopted as part of a strategy for achieving a "socially acceptable" standard for cleanup.

[11] For example, if we look at mold we can see how a total mistrust of building remediation procedures can result in undesirable outcomes. In the late nineties, driven by an activist in California, a mold war exploded. Mold as a contaminant is for the most part an order of magnitude less problematic than Anthrax, yet even with mold, there was public hysteria, refusal of individuals to go back to work in buildings affected by mold, and numerous settlements for personal-injury claims and property damage caused by mold. By 2002, insurers had reported $3 billion in annual losses nationwide (Heimpel, 2008).

[12] Nevertheless, it should be noted that coordinating challenges often arise between governmental operations centers and the on-site incident command where the first responders are operating from. Security concerns and the inherent disconnect between these bodies can slow the flow of time-critical health information.

[13] For the full text of the plan see: PSC (2011)

[14] PHAC through its Centre for Emergency Preparedness and Response is the health authority in the Government of Canada on bioterrorism, emergency health services and emergency response (PHAC, 2005).

[15] Other functions that could be implemented are:

- ESF #1 – Transportation (PD: Transport Canada) in the event that there was a need to: (a) restrict movement of regulated transportation conveyances, goods and people or seek voluntary compliance; or (b) make recommendations regarding the usage/availability of civil transportation and/or Transport Canada assets.
- ESF #8 – Law Enforcement (PD: RCMP) for the coordinated provision of the full range of law enforcement services by the RCMP, and the police services of other jurisdictions, during all-hazard emergency operations.
- ESF #11 – Logistics and Operations Management (PD: PS) to assessing problems and scoping potential solutions to coordinate the mobilization and deployment of resources from their points of origin to the intended staging areas.
- ESF #12 – Communications (PD: PS) to guarantee the dissemination of clear, factual, and consistent information about events of national significance and assisting, when possible, to minimize the threat to Canadians most likely affected by the event. At the same time, this function provides a framework that Government of Canada institutions can follow to share relevant communications information and to work collaboratively to achieve integrated and effective emergency communications.

[16] For the full text of the Act see: Department of Justice (2007)

[17] For the full text of the Act see: Department of Justice (2003)

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