Exercise Perseverance:

Capability Assessment Table Top Exercise After Action Report

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Abstract

This report describes the effort provided by Defence Research and Development Canada's (DRDC) Centre for Security Science (CSS) to support Exercise Perseverance held 13 June 2013. Exercise Perseverance was a table top exercise (TTX) used to assist in validating an assessment methodology and identifying capability requirements and gaps. This report outlines preparations which included generation of a pandemic scenario and creation of a capability framework, and describes the conduct of the TTX. It also summarizes findings related both to the approach and to the capability requirements and gaps relating to mitigation and response to a pandemic.

Résumé

Le présent document concerne la participation du Centre des sciences pour la sécurité (CSS) de Recherche et développement pour la Défense Canada (RDDC) au bon déroulement de l'exercice Persévérance qui s'est tenu le 13 juin 2013. L'exercice Persévérance était un exercice sur table (XT) qui visait à faciliter la validation d'une méthode d'évaluation et la définition des besoins et des lacunes en matière de capacités. Le document expose la préparation de l'XT, qui consistait notamment à créer un scénario de pandémie ainsi qu'un cadre de capacités, la conduite de l'exercice ainsi que les résultats qui se rapportent tant à la méthode qu'aux besoins et aux lacunes en matière de capacités en ce qui concerne l'atténuation et l'intervention en cas de pandémie.

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Capability Assessment Table Top Exercise After Action Report

Doug Hales, Peter Avis, Shaye Friesen, DRDC DRDC CSS TR 2013-010; Defence R&D Canada Centre for Security Science August 2013.

Introduction: This document describes the preparations for and the conduct of Exercise Perseverance, a Table Top Exercise (TTX) held in Ottawa on June 13th 2013. The objectives of the TTX were twofold: to trial capability assessment; and to solicit subject matter expertise to identify capability requirements and gaps relating to the Health Portfolio (HP).

Capability assessment is intended to provide a complementary link between risk assessment and investment planning. In preparation for the TTX, a methodological approach was agreed upon and a Users' Guide was drafted and distributed. The approach was based on a Strategy-to-Task, Mission/Function/Task decomposition. A capability framework was based on the Government of Canada (GC) Emergency Management (EM) pillars and a HP task library drawn from the Target Capability List – Canada (TCL-C), existing plans, and recent lesson learned reports. An initial capability inventory was created and existing capability elements catalogued. To facilitate assessment and to seed the discussion, observations from some previous after-action reports were related to HP capabilities and tasks.

Methodology: A full-spectrum scenario was developed to provide context and invoke capability requirements. An event library was created recording events relating to a pandemic. The focus of the TTX determined the scope: from this library events were selected and used.

The Centre for Security Science (CSS) hosted Exercise Perseverance. To form the structure of the TTX, the scenario was parsed into Prevent, Prepare, Respond and Recover segments, corresponding to the four EM pillars. At the end of each TTX segment, facilitated discussion included an examination of setting, identification of triggers, and an illustrative assessment of predetermined tasks conducted collectively. Participants were then invited to individually complete an assessment of HP tasks and asked to record comments explaining their rationale.

Results: Following the TTX, the worksheets were collected, individual assessments collated, and 'scorecards' generated using a Green/Yellow/Red stoplight rating scale. Although neither validated nor definitive, the results were instructive and insightful. While there are some areas of variance; in general, there was a broad consensus among the HP representatives who took part. The preponderance of capabilities was assessed to be adequate (rated Green). However, a number of concerns (rated Yellow) were noted. These included:

• **Prevent**: The ability to balance investment and allocate resources according to priorities is seen to have serious gaps in the people and organization and policies, processes, and procedures capability elements. Next, the ability to develop ontologies and information and intelligence protocols is seen to have serious gaps in policies, processes, and procedures and infrastructure, technologies, and tools capability elements. Also, the

ability to define liabilities and establish regulatory regimes (e.g. accreditation) and publish standards and certifications was judged to have serious gaps across all capability elements. Finally, research & development, and specifically identifying and understanding existing/emergent opportunities, is also considered a task of high importance and one that presents a serious gap (bordering on critical, given several red ratings).

- **Prepare**: Serious gaps were seen in managing relationships and the establishment of mutual aid agreements between organizations and authorities and incident management governance. TTX discussion affirmed that there is a divergence of views as to how well-established Integrated Management System (IMS) structures and processes are. It was suggested that inter-sectorial exposure and practice would be particularly useful to remedy this gap. The third gap relates to managing Human Resources. The results reflect concerns over the identification and determination of training requirements and HR record keeping, and the organization, policy and tools for training, qualifying and positioning of HP personnel. Establishing readiness posture and maintaining immediate/emergency response teams were also identified as concerns. Lastly, assessments diverge as to how frequent and how well plan validation is being is being conducted.
- **Respond**: Concern was raised with respect to consequence management; keeping in mind a distinction was made between incident and consequence management. The ability to access and exploit specialist expertise, especially in the infrastructure, technology, and tools capability element, is found to be wanting. The ability of the HP to augment (surge) information collection, analysis, and EOC staffing in the Respond phase is seen to be a serious gap in the people and organization and policies, processes, and procedures capability elements. Both managing primary health care workers and public health care workers for surge capacity and sustainment during the Respond stage of a pandemic are seen to be uniformly serious gaps across all capability elements. Although directing "front line/tactical operations" is not a predominant concern for many (as reflected by the small response set in the worksheets), it is for those charged with responsibilities for First Nations and Federal populations. Capabilities relating to directing tactical operations, conducting emergency triage and pre-hospitalization, monitoring on-scene response, maintaining public order, and evacuating, sheltering and feeding citizens, were identified as serious gaps. Monitoring effectiveness (and adverse effects) of vaccines is seen to have serious gaps across all capability elements.
- **Recover**: Concerns centered on identifying and tracking long term health effects including post-traumatic stress and provision of long term care, adjusting and implementing plans to restore HP services and capabilities, and managing human resources including demobilization and compensation. Recovery planning was recognized as a government (if not societal) wide challenge.

There was only one 'critical' capability gap identified (rated Red). It was in the Prevent capability group and was a common/enabling capability: Recruiting and developing specialists (as a preventative measure) was seen to be a critical gap. Several other 'unresolved' gaps have potential to be serious or critical; however, they will need a second assessment to resolve variance of ratings.

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From the perspective of capability elements, the analysis led the project team to the following conclusion: Infrastructure, Technology, and Tools is not where the immediate challenge lies. Rather, targeting of investment should sway towards the capability elements of People and Organization and Policies, Processes, and Procedures as a priority.

While perhaps crude indicators, this information may provide useful indicators suggesting where further investigation and targeted investment is warranted. Observations and analysis indicate that Health Canada's focus is markedly narrower than PHAC's for this type of event, and that the mandate and set of capability requirements of FNIHB (and presumably others charged with responsibilities for Federal populations) differ from 'core' PHAC capabilities. This raises the question of whether and when it is worth considering capability subsets.

Of special note, the FNIHB contribution proved that their mandate and world view were markedly different from the rest of the HP community (there may be other agencies with the same experience). From the results of the capability assessment, the FNIHB ratings displayed a perception that all four pillars had many serious gaps in capability which need to be rectified. Clearly, some attention to this governance area seems warranted.

Significance: The TTX provided an opportunity to trial a capability assessment methodology. It led to the major conclusion that future investment should be balanced and targeted across the capability groups in HP. Moreover, the TTX highlighted that the pillars of Respond and Prevent, and the FNIHB area, present the best opportunities for balanced and targeted investment. It is also germane that any investment should be targeted at an area where it can best be absorbed. The TTX drew attention to the advantages of a common planning framework. The capability framework and Mission/Function/Task approach appeared to work well, although it was noted that the HP task library would benefit from further review and alignment. It is not clear how useful the capability inventory was -- or whether it is worth extending and maintaining. Similarly, it was observed that more 'seed assessment' information is available; however, again, it is not clear whether this line of attack is worth pursuing. The capability elements provided appropriate discrimination in attributing shortfalls to guide investment planning. Several minor refinements to the assessment scoring (e.g. a 5-point Likert scale) were suggested and were noted.

A participant's survey was administered at the close of play. With one exception, participants indicated that they found Exercise Perseverance to be worthwhile, wanted to be part of the follow-on, and would be willing to take part in similar exercises in the future.

Future Work: The capability assessment methodology demonstrated sufficient promise to warrant continued refinement and a second trial, focusing perhaps on a malicious threat, different Community of Practice (CoP) and type of exercise (e.g. a live exercise (livex)) vice a TTX. The assessment itself could institutionalize the approach within the HP COP and extend and/or deepen this initial capability analysis.

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Doug Hales, Peter Avis, Shaye Friesen, DRDC CSS TR 2013-010, Centre des sciences pour la sécurité, R & D pour la défense Canada (août 2013)

Introduction : Le présent document expose la préparation et la conduite de l'exercice Persévérance, un exercice sur table (XT) qui s'est déroulé à Ottawa le 13 juin 2013. Les objectifs de l'XT étaient doubles : tester une méthode d'évaluation des capacités et faire appel à des compétences spécialisées sur la question afin de définir les besoins et les lacunes en matière de capacités relatives au portefeuille de la santé (PS).

L'évaluation des capacités est destinée à constituer un lien complémentaire entre l'évaluation des risques et la planification des investissements. En préparation de l'XT, une approche méthodologique a fait l'objet d'un commun accord et une ébauche de guide de l'utilisateur a été rédigée et distribuée. L'approche est fondée sur la méthode d'analyse descendante de la stratégie à la tâche (Strategy-to-Task), une décomposition en missions, fonctions et tâches. Un cadre de capacités a été créé, lequel était inspiré des piliers de la gestion des urgences (GU) du gouvernement du Canada (GC) et d'une bibliothèque de tâches relevant du PS extraites du Guide des capacités ciblées–Canada (GCC-C), de plans existants et de récents rapports faisant état de leçons retenues. Un premier inventaire des capacités a été produit, et les éléments de capacité existants ont été catalogués. Pour faciliter l'évaluation et lancer la discussion, on a établi un lien entre des observations formulées dans certains comptes rendus après action antérieurs et les capacités et tâches relatives au PS.

Résultats : Un scénario d'ensemble a été élaboré pour fournir un contexte et faire apparaître les besoins en matière de capacités. On a créé une bibliothèque des événements pour consigner les événements relatifs à une pandémie. L'angle de l'XT en a déterminé la portée : les événements utilisés ont été sélectionnés dans cette bibliothèque.

Le Centre des sciences pour la sécurité (CSS) a été l'organisateur de l'exercice Persévérance. Pour établir la structure de l'XT, le scénario a été analysé selon les volets « prévenir », « préparer », « intervenir » et « rétablir », lesquels correspondent aux quatre piliers de la gestion des urgences. À la fin de chaque volet de l'XT, au moyen d'une discussion orientée par un animateur, les participants ont été appelés, collectivement, à examiner le cadre, à dégager les éléments déclencheurs et à évaluer, à des fins indicatives, les tâches prédéterminées. Puis, ils ont été invités à évaluer individuellement, par écrit, les tâches du PS et à formuler des commentaires pour expliquer leur raisonnement.

Après l'XT, les feuilles de travail ont été recueillies, les évaluations personnelles ont été colligées et des « cartes de pointage » ont été produites avec une échelle de notation inspirée des feux de circulation (feux vert, jaune et rouge). Bien qu'ils ne soient ni validés ni définitifs, les résultats sont instructifs et éclairants. On a constaté une variance dans le cas de certains éléments, mais il existait, en général, un large consensus parmi les représentants du PS qui ont participé à

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l'exercice. La majorité des capacités a été considérée comme adéquate (notée « feu vert »). Cependant, un certain nombre de préoccupations (« feu jaune ») ont été dégagées, dont les suivantes :

- **Prévenir** : La capacité d'équilibrer les investissements et d'affecter les ressources en fonction des priorités comporte de graves lacunes au niveau des éléments « personnel et organisation » et « politiques, processus et procédures » de la capacité. Ensuite, la capacité d'élaborer des ontologies et des marches à suivre en matière d'information et de renseignement est très déficiente en ce qui concerne les éléments « politiques, processus et procédures » et « infrastructure, technologies et outils ». En outre, des lacunes graves ont été relevées dans tous les éléments de la capacité à définir les responsabilités et à établir des régimes de réglementation (p. ex. accréditation) et de la capacité à publier des normes et des attestations. Finalement, la recherche et développement (plus particulièrement, le volet consistant à reconnaître et à comprendre les possibilités existantes et nouvelles) est également considérée comme une tâche de grande importance qui présente une sérieuse lacune (à la limite du très grave, étant donné que plusieurs « feux rouges » lui ont été attribués dans l'évaluation).
- Préparer : De graves lacunes ont été constatées dans la gestion des relations, l'établissement d'ententes d'assistance mutuelle et la gouvernance en matière de gestion des incidents. La discussion lors de l'XT a permis d'affirmer qu'il existe une divergence d'opinions quant à la mesure dans laquelle les structures et les processus relatifs au système de gestion intégré sont bien établis. On a avancé que l'exposition et la pratique intersectorielles seraient particulièrement utiles pour combler cette lacune. La troisième lacune concerne la gestion des ressources humaines. Les résultats traduisent des préoccupations quant à la définition des besoins en matière de formation et à la tenue des dossiers des ressources humaines, ainsi qu'à l'organisation, aux politiques et aux outils nécessaires à la formation, à l'évaluation des compétences et au placement du personnel du PS. L'atteinte d'un état de préparation et le maintien des équipes d'intervention immédiate/d'urgence ont aussi été considérés comme préoccupants. En dernier lieu, les points de vue diffèrent quant à la fréquence et à la qualité de la validation des plans.
- Intervenir : Des craintes ont été soulevées en ce qui concerne la gestion des conséquences (pour rappel, on a établi une distinction entre la gestion des conséquences et la gestion des incidents). La capacité à faire appel à des spécialistes et à tirer profit de leurs compétences, plus particulièrement dans l'élément « infrastructure, technologies et outils » de la capacité, fait défaut. La capacité du PS à augmenter (intensifier) la collecte de l'information, l'analyse et la dotation en personnel du centre des opérations d'urgence à l'étape de l'intervention est considérée comme très déficiente dans les éléments « personnel et organisation » et « politiques, processus et procédures » de la capacité. La gestion du personnel en santé primaire et la gestion du personnel en santé publique lorsqu'il faut augmenter et maintenir la capacité au cours de la phase d'intervention

d'une pandémie comportent toutes deux de graves lacunes en ce qui concerne tous les éléments de la capacité. Bien que le fait de diriger « des opérations de première ligne et des opérations tactiques » ne soit pas une préoccupation principale pour bon nombre de personnes (comme le révèle le petit ensemble de réponses figurant sur les feuilles de travail), cela l'est pour les personnes assumant des responsabilités à l'égard des Premières Nations et des populations sous responsabilité fédérale. De graves lacunes ont été constatées dans les capacités nécessaires pour diriger les opérations tactiques, effectuer le triage d'urgence et prodiguer les soins préhospitaliers d'urgence, superviser l'intervention sur place, maintenir l'ordre public et évacuer, mettre à l'abri et nourrir les citoyens. En ce qui concerne les vaccins, la surveillance de l'efficacité (et des effets indésirables) comporte de graves lacunes dans tous les éléments de la capacité.

• **Rétablir :** Des préoccupations ont été relevées dans les capacités à déceler et à suivre les effets à long terme sur la santé (notamment l'état de stress post-traumatique) et à prodiguer des soins de longue durée; à adapter et à mettre en œuvre des plans visant à rétablir les services et les capacités du PS; et à gérer les ressources humaines (en matière de démobilisation et de rémunération, notamment). La planification du rétablissement est considérée comme une tâche relevant de l'ensemble de l'administration fédérale (si ce n'est de la société).

Une seule capacité comporte des lacunes qualifiées de « très graves » (notée « feu rouge »). Ces lacunes ont été décelées dans le groupe de capacités « prévenir » et concernaient une capacité commune et habilitante, soit le recrutement et la formation de spécialistes (comme mesure préventive). Plusieurs autres lacunes « non résolues » pourraient se révéler graves ou très graves, mais il faudrait effectuer une autre évaluation pour réduire la variance des résultats.

Si l'on considère les éléments de capacité, l'analyse a permis à l'équipe de projet de conclure que le défi immédiat ne réside pas dans l'élément « infrastructure, technologies et outils ». Il faudrait plutôt investir en priorité dans les éléments « personnel et organisation » et « politiques, processus et procédures ».

Ces renseignements sont peut-être des indicateurs approximatifs, mais ils peuvent être utiles pour déterminer où il serait justifié d'approfondir la recherche et d'effectuer des investissements ciblés. Selon les observations et les analyses, les cibles de Santé Canada sont bien plus étroites que celles de l'Agence de la santé publique du Canada (ASPC) pour ce type d'événement, et le mandat ainsi que l'ensemble des besoins de la Direction générale de la santé des Premières nations et des Inuits (DGSPNI) (et, on le présume, d'autres qui assument des responsabilités à l'égard de populations sous responsabilité fédérale) en matière de capacité diffèrent des capacités de base de l'ASPC. Cela soulève la question de savoir s'il convient de considérer des sous-ensembles de capacités et quand il convient de le faire.

Il est à noter que la contribution de la DGSPNI démontre que son mandat et sa perception du monde sont très différents du reste de la communauté du PS (il existe peut-être d'autres organismes qui partagent la même expérience). D'après les résultats de l'évaluation des capacités, les notes attribuées par la DGSPNI ont révélé une perception selon laquelle les quatre piliers

présentent, en matière de capacité, un grand nombre de lacunes graves qui doivent être corrigées. Il semble clairement justifié de se pencher sur cet élément de gouvernance.

Importance : L'XT était l'occasion d'essayer une méthode d'évaluation des capacités. Il a permis de tirer la principale conclusion que les investissements à venir devraient être équilibrés et ciblés sur tous les groupes de capacité du PS. De plus, l'exercice a mis en évidence le fait que les piliers « intervenir » et « prévenir », et le volet DGSPNI, constituent les meilleurs choix pour des investissements équilibrés et ciblés. Il est également approprié que chaque investissement soit affecté au secteur où il sera le mieux utilisé. L'XT a attiré l'attention sur les avantages d'un cadre de planification commun. Le cadre de capacités et l'approche par mission, fonction et tâches semblent bien fonctionner, quoiqu'un examen approfondi et une harmonisation puissent être utiles pour la bibliothèque de tâches du PS, a-t-on souligné. On ne sait à quel point l'inventaire des capacités a été utile et s'il vaut la peine de le prolonger et de le tenir à jour. De même, on a constaté qu'il existait davantage de renseignements sur « l'évaluation par amorce ». Cependant, il n'est pas clair non plus si cet angle d'attaque est valable. Les éléments de capacité permettaient une bonne discrimination pour l'attribution des lacunes en vue d'orienter la planification des investissements. Plusieurs ajustements mineurs ont été suggérés, et consignés, en ce qui concerne la notation de l'évaluation (p. ex. utiliser l'échelle de Likert de cinq points).

Un sondage a été effectué auprès des participants à la fin de l'exercice Persévérance. À l'exception d'un participant, tous ont indiqué qu'ils avaient trouvé l'exercice utile, qu'ils voulaient participer au suivi et qu'ils accepteraient de prendre part à d'autres exercices similaires.

Travaux à venir : La méthode d'évaluation des capacités s'est révélée suffisamment prometteuse pour mériter une amélioration continue et un deuxième essai, mais il faudrait peut-être mettre l'accent sur une menace malveillante, ainsi que sur une communauté de pratique (CoP) différente et un autre type d'exercice (p. ex. un exercice réel [LIVEX]) qu'un XT. L'évaluation en tant que telle pourrait permettre d'institutionnaliser la démarche au sein de la CoP du PS et de prolonger et/ou approfondir cette première analyse des capacités.

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1.1 Background

1.1.1 Centre for Security Science (CSS)

The Defence Research and Development Canada's (DRDC) Centre for Security Science (CSS) is formed on an agreement between the Department of National Defence (DND) and Public Safety Canada. The CSS works collaboratively with all levels of government, industry, academia and emergency management organizations. As part of its mission, DRDC CSS leads the Canadian Safety and Security Program (CSSP),¹ a Treasury Board approved program for public safety and security science and technology. The CSSP mission is "to strengthen Canada's ability to anticipate, prevent/mitigate, prepare for, respond to, and recover from acts of terrorism, crime, natural disasters, and serious accidents through the convergence of science and technology with policy, operations, and intelligence."²

1.1.2 Exercise Perseverance

In accordance with direction and guidance received from the Assistant Deputy Ministers' Emergency Management Committee (ADM EMC) in December 2012, DRDC CSS (in partnership with Public Health Agency of Canada and Public Safety Canada) is investigating how a capability assessment might be applied, contribute to a shared appreciation of requirements and shortfalls, and inform public safety/security investment decisions. It is envisaged that a capability assessment process would complement the federal All Hazards Risk Assessment (AHRA) approach providing for a more detailed needs and gap analyses. Acting on this direction, CSS sponsored a capability assessment exercise in order to pilot the concepts that have been developed and nurtured over the years.³ This After Action Report (AAR) describes the preparations and conduct of the table top exercise (TTX) -- named *Exercise Perseverance--* and documents the exercise findings.

Exercise Perseverance was a full-day, TTX which took place at the CSS, located at 222 Nepean Street in Ottawa on 13 June, 2013 from 0900 to 1530. The purpose of this pandemic capability assessment TTX was to solicit subject matter experts' assistance in identifying and documenting the capabilities required by and concerns of the HP (HP) and partners to prevent, prepare, respond, and recover to a pandemic event.

¹ <u>http://www.drdc-rddc.gc.ca/en/science-tech/security-science.page</u>?

accessed 22 March 2013.

² Ibid.

³ CSS had previously published a Scenario Management Framework report based on a review of 90+ scenarios and vignettes, and developed a scenario characterizing scheme and prototype toolbox consisting of: Consolidated Risk assessment (CRA) database (DB) tool, Vignette DB, Full-Spectrum Scenario Management System DB (with capability inventory and assessment). Some of this work is being aligned with this initiative as a natural extension of the AHRA framework.

The exercise objectives for Exercise Perseverance were the following:

- To solicit subject-matter expertise to identify capability requirements and gaps before, during, and after a pandemic;
- To improve upon the Target Capability List Canada (TCL-C) and attribute capability gaps across the components of (e.g. people and organizations; policies, processes, and practices; infrastructure, tools and technology);
- To consider how a capability assessment can inform emergency management (EM) planning;
- To conduct a proof of concept, validating, and improving a capability assessment methodology; and,
- To promote linkages between HP members and other Federal Government departments and agencies.

The scope of the exercise is described by the following points:

- The TTX will be derived from and will complement the AHRA approach, and will be conducted from a HP perspective;
- The TTX will cover the EM timeline through the stages of Prevent, Prepare, Respond, and Recover as they relate to a pandemic scenario that affects Canada;⁴
- The capability framework will be derived from the TCL-C and include Governance and Common/Enabling capabilities that map across the continuum of response ;
- As a start point, the capability gaps will be defined in terms of people, policies, processes and practices; tools and technology; and
- Although it will be hosted by CSS, the HP will be the lead department for the full day TTX.

1.1.3 Document Structure

This document consists of the following sections:

- Section One outlines the project background and the objectives and scope of Exercise Perseverance;
- Section Two describes the preparations undertaken in advance of the TTX;
- Section Three discusses conduct of the exercise;

⁴ In accordance with EM policy, prevention in the context of this report also includes mitigation.

- Section Four summarizes the conclusions reached by participants findings relating to capabilities invoked and gaps identified;
- Section Five presents observations of the project team relating to both the exercise and the methodology;
- Section Six offers thoughts and recommendations on the way ahead.

2 **Preparations**

2.1 Methodology Development

While capability assessment is not new to western defence communities, it is relatively new for Canadian government departments and agencies. Thus, the deliberate movement from AHRA to capability assessment is not without its challenges. Some of the immediate challenges for this project lay in developing a methodology that was not overly complex and laying out simple practices and flexible procedures for conducting a capability assessment. Capability assessments carried out previously by the United States (US) and Canadian defence communities tended to be elaborate and difficult to sustain, despite the advantages of doctrine and large planning staff.

2.1.1 Capability Assessment Model

The first step in developing a capability assessment methodology lay in designing an overriding process map and logic model to situate capability assessment and explain to HP Emergency Preparedness Committee (HP EPC), Sub-Committee on Public Health Emergency Risk Assessment (PHERA) members how the key pieces fit together.⁵



Figure 1: Capability Assessment Model

⁵ Part way through the project, the title of the Joint Emergency Preparedness Committee (JEPC) changed to the HP Emergency Preparedness Committee (HP EPC), Sub-Committee on Public Health Emergency Risk Assessment (PHERA).

As depicted in the red box in Figure 1 (above), capability assessment is intended to provide the link between risk assessment and investment planning. The start point is the AHRA process. AHRA has been adopted by the federal government to establish common principles, processes, and criteria for identifying and evaluating risks.⁶ Threats and hazards are ordered and the AHRA provides a common framework that enables federal departments to identify those which warrant a more detailed analysis. Scenarios have become a very popular and useful means for exploring policy interpretations and their implications. Scenarios are employed to typify the problem space, to illustrate threats or hazards, and to derive and capture assumptions. The term "full-spectrum scenario" was introduced to underscore that pre-event emergency management (prevention and preparation) starts before an incident occurs and consequence management (response and recovery) extends beyond the immediate reaction to an incident. The development and employment of a full spectrum scenario is intended to provide a tool which facilitates resource allocation and prioritization in order to achieve balanced investment across the emergency management spectrum of activity.

2.1.2 Capability Framework

A common framework provides a vantage point across Capability Groups which can facilitate "corporate" planning. With capabilities and tasks mapped to a framework, tasks from decisions at the capability group level can be more easily and effectively decentralized for implementation. Reaching agreement on a taxonomy and terminology is an essential precursor to communications and knowledge management, and to mutual understanding and interoperability. It was agreed from the onset that this framework should be founded on capability based planning (CBP).⁷ CBP was introduced and has been adopted widely as a means to cope with the ambiguities and uncertainties in the current public safety and public security environments. It focuses on desired outcomes and employs a functional approach for describing concepts of operation, defining requirements, characterizing resources, and assessing gaps. Focusing on functionality raises the level of abstraction and allows for separation between requirements and solutions; ends are identified but ways and means are not specified. This approach encourages innovation and facilitates integration.

It was decided to base the overarching schema, or capability ordering schema, on the EM pillars and it was reasoned that, collectively, capability groupings of Prevent, Prepare, Respond, Recover and common/enabling sufficed to define the public safety and public security environment. The first four pillars are cited in the *Emergency Management Act* (EMA) and US and Canadian Target Capability Lists distinguish common/enabling functions (e.g. risk assessment, planning, resource management, information and intelligence sharing, and communications) as a separate group.⁸ It was determined that a sixth capability group, governance, should be added to reflect oversight capabilities relating to managing demands across domains, defining roles, responsibilities, and relationships, allocating resources, and coordinating activities and administration. The graphic below (Figure 2) proved useful in illustrating the concept.

⁶ Emergency Management Planning Public Safety Canada, All Hazards Risk Assessment Methodology Guidelines 2012-2013, <u>http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ll-hzrds-ssssmnt/ll-hzrds-</u>

⁷ See bibliography for references and citations on CBP.

⁸ Centre for Security Science. Draft Target Capability List – Canada, Defence R&D Canada, January 2012.



Figure 2: Capability Framework

2.1.3 Mission, Function, Task Analysis

The next challenge involved developing the means to relate the capability framework to activities and assets. The approach adopted was that of a Mission, Function, Task decomposition (also termed a "Strategy to Task analysis"). As depicted (in Figure 3), the approach starts with a review of the mission, described in the full spectrum scenario, and a determination of mission objectives. Next, functional requirements are identified; that is, the capability needs are distinguished. The analysis becomes less abstract and more grounded when these requirements are translated into associated activities and assignments. Moreover, tasks (specified and implicit actions) which are essential to realizing mission objectives can be identified and can be assigned to organizations and people; supported by policies, processes, and practices; and applied using infrastructure, technology, and tools. This approach allowed for systematic analysis. The tasks depicted in Figure 3 are derived from the HP sector for the task analysis of a pandemic event.



Figure 3: Mission, Function, Task Analysis

Two other features are particularly noteworthy. It is a combination of components or elements that generate capabilities – the ability to perform a task (to specified standards under specified conditions). There are a number of decomposition schemes; many are understandably organizationally driven.⁹ The schemes that work for the Health Portfolio may not work for other departments and agencies; and therefore, should be reviewed for change when switching venue. In an attempt to simplify assessment, it was decided to reduce the number of decomposition schemes to three:

- **People and Organization** the human resource component (e.g., manning levels and knowledge, skills, and attribute sets). Includes education, qualifications, experience, competency, training, and organizational structure, roles, and responsibilities;
- **Policies, Processes, and Practices** the policies, processes, and practices component, (e.g. activity criteria (thresholds and triggers) and sequencing, information flows, distribution of authority and decision structures, governance and tasking); and

⁹DND/CF's Personnel, Research & Development, Information & Intelligence, Concepts & Doctrine, Infrastructure and Engineering & Maintenance (PRICIE) and the U.S. DoD's Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF). The TCL-C proposes 6 elements: Planning, Organization & Leadership, Personnel, Equipment and Systems, Training and Exercises, Evaluations and Corrective Actions.

• **Infrastructure, Technology, and Tools** – the tools and material component (e.g. infrastructure (software applications, hardware systems, networks) and knowledge (data, information and intelligence)).

As suggested, the capability assessment methodology was developed to support more than the proof of concept. It is envisaged that it could be extended to other EM communities. There is an inherent tension between generic and personalized capability frameworks and task list processes. The Mission, Function, Task approach that has been adopted for this project reflects an attempt to establish middle ground. The capability groups (based on the EM pillars) and the corresponding capabilities are intentionally general – and will hopefully allow for the results of capability assessments to be integrated -- albeit at a high level. Conversely, it was proposed that the EM communities should assume responsibility for task specification. The TCL-C suffers from trying to be all things to all communities. No distinction is drawn between strategic and tactical tasks and/or communities. As a result, the TCL-C is voluminous, unwieldy, and intimidating, and a challenge to maintain.

2.1.4 Task Library

The next step involved developing a task library. As noted, it was hoped that SMEs could be invited to assist (a sub-team was able to review the methodology). Moreover, the project team studied pandemic plans and reports and referenced the TCL-C. What were perceived to be tasks relating to the HP were collected and ordered using Microsoft EXCELTM software. Although common/enabling and governance functions span the EM pillars (seen in the vertical axis of Figure 4 below), associated tasks could be differentiated. Separate sheets were developed for Prevent, Prepare, Respond, and Recover and an initial task library was generated to seed the discussion. It was realized that advantage should be taken of the TTX to force a review during which a validation of the task library would take place and additional tasks could be added. An extract is shown below at Figure 4.

Capability Groups	Capability	Health Portfolio Tasks
Governance	Manage relationships	Establish accountability framework
	Conduct strategic planning	Develop and publish national Health Portfolio Public Safety/Security strategy
Common	Manage data information and intelligence	Develop ontologies, information and intelligence sharing protocols
	ivianage data, miormation and intelligence	Establish information and intelligence collect priorities
		Identify, understand existing/emergent opportunities
Prevent	Direct Research & Development	Identify, understand social behaviour
		Establish centres of excellence and testbeds
	Audit Prevention	Establish objectives, metrics and auditing process

Figure 4: Task Inventory

2.1.5 Capability Inventory

Both theory and practice suggested that the next move should involve developing a capability inventory. To simplify things at the start, a single sector/federal institution (the Health Portfolio) was selected for the assessment. It is conceded that eventually the capability frameworks will have to cover multiple sectors and federal institutions in partnering arrangements where horizontal support will be common practice. For the start though, it has been decided to work through a single sector in order to create a solid foundation. An initial attempt to catalogue capability elements was made; that is, columns were added to the right of "Health Portfolio Tasks" in Figure 4 (above) and note taken of: organization and people; policies, processes, and practices; infrastructure, technology, and tools associated with each of the tasks. These new columns are seen with capability elements in them in Figure 5 (below). This proved very useful both in developing a common interpretation of tasks and in situating existing, known elements.

The aim was to develop a generic framework which could be used to support capability assessments of other EM portfolios. It is also worth noting in passing the distinction drawn in Respond between incident and consequence management, tasks associated with the former being focused, in this case, on containing and countering a pandemic virus and activities associated with the latter focused on the broader consequences such as absenteeism, and maintenance of critical services (e.g. water, power, transportation) and public order.

					Capability E	lements		
Capability Group	Capability	Health Portfolio Tasks	Organization & People	Assessment	Policies, Processes & Practices	Assessment	Infrastructure, Technology, and Tools	Assessment
	Establish/activate incident management governance structure and decision processes			R/Y/G	Federal Emergency Response Plan (FERP)	R/Y/G		R/Y/G
Governance	Establish/activate consequence management governance structure and decision processes		ADM(EMC), DG ERC	R/Y/G		R/Y/G		R/Y/G
		Manage personal protective equipment		R/Y/G		R/Y/G		R/Y/G
	Manage Materiel and infrastructure	Develop, test and authorize vaccine (medical countermeasures)	Pandemic Influenza Committee	R/Y/G		R/Y/G		R/Y/G
Common	Manage Human Resources	Augment information collection, analysis and EOC staffs		R/Y/G		R/Y/G		R/Y/G
	Manage Communications	Notify internal authorities and partners	Liaison Officers	R/Y/G	Incident/Event Report, F/P/T Notification Process, SITREP Processes, Daily Surveillance Report Process	R/Y/G	Canadian Public Health Laboratory Network (CPHLN)	R/Y/G
		Maintain public order		R/Y/G		R/Y/G		R/Y/G
Perpend	Managa Concosuloncos	Mitigate consequences, implement disease control strategies	DM EMC, Federal Coordinating Officer, ADM, EMC, GOC, Federal Coordination Group	R/Y/G		R/Y/G		R/Y/G
Nesponu	manage consequences	Evacuate, shelter/shelter-in- place and feed citizens		R/Y/G		R/Y/G		R/Y/G
		Manage fatalities		R/Y/G		R/Y/G		R/Y/G

Figure 5: Capability Inventory

2.1.6 Seeding the Assessment

Given the time constraints posed by a one-day TTX, it was determined that it would be worthwhile seeding the capability assessment – acknowledging lessons learned and situating these within the capability framework. In large part, this effort can be viewed as an attempt to systemize the insights that emerged from prior studies and reports. The team would have liked to have been in a position to draw on recent H7N9 and Coronavirus experiences and observations; but the pace of operations precluded access to SME. A 'second-best' solution involved review of some recent seminal reports and relating findings to HP tasks. Again additional EXCEL columns were introduced (to the right of columns in Figure 6) and arranged chronologically from severe acute respiratory syndrome (SARS) on the extreme right hand side through to more recent pandemics to assist in framing the discussion and orienting the assessment. It was anticipated that this would also assist in highlighting the advantages of a common framework in characterizing lessons learned and tracking remediation and progression.

		Health Portfolio	Overall A	ssessment		CSA Stds Roundtable H1N1 June	
Capability Group	Capability	Tasks	Capability	Criticality	Notes	2010	Learning from SARS 2003
Governance	Establish/activate consequence management governance structure and decision processes		R/Y/G	H/M/L			Lack of coordinated business processes across institutions and jurisdictions for outbreak management and emergency response. Inadequacies in institutional outbreak management protocols, infection control, and infectious disease surveillance. Weak links between public health and the personal health services system, including primary care, institutions, and home care.
		Notify internal authorities and partners	R/Y/G	H/M/L			
Common	Manage Communications	Public Communications and Alerting	R/Y/G	H/M/L		Information on personal protective equipment was not concise/specific enough. An integrated F/P/T communications body comprised of medical officers and disaster management experts should be created to enable jurisdictions to interpret what is	
Respond	Detect incidents	Investigate and characterize events/incidents (epidemiological investigation, deployable capability, lab testing, rapid assessment)	R/Y/G	H/M/L			Diagnosis rested on clinical syndrome. Available laboratory tests were not consistently helpful. Difficulties with timely access to laboratory testing and results. Inadequate capacity for epidemiological investigation of the outbreak.
		Confirm/Verify incident/attack	R/Y/G	H/M/L			
	Manage On-Site response. (Incident Command)	Direct tactical operations e.g. First Responders, Case and Contact Management	R/Y/G	H/M/L			Lack of surge capacity in clinical and public health systems

Figure 6: Situating & Seeding Assessment

2.2 Scenario Development

Several factors fed into the scenario selection and development. First the Health Portfolio JPEC was willing to participate in a proof-of-concept, and the capability assessment proposal fit into their program priorities and timing. The associated risk descriptor, an output of the AHRA

process, provided an outline. Finally a pandemic related scenario was appropriate given that "an influenza pandemic is the public health event most likely to have a major national impact".¹⁰

Although there was general agreement to focus on a pandemic crisis scenario, there remained considerable leeway in scope and setting. To commence the development of the full spectrum scenario, a literature search was conducted and a number of reports, plans, and scenarios were identified. From this collection of data on pandemics, challenges could be identified, discrete events selected and causal relationships determined. An EXCEL spreadsheet was used to structure the data. A chronological timeline served as a horizontal/X axis, against which events and pandemic phases could be mapped. 'Swim lanes' of related organizational activity were distinguishable and provided a means for characterizing events. Thus, the spreadsheet evolved into an event catalogue.

Obviously time precluded 'playing' all events so at this point, TTX participation provided a filter, informing which issues should be explored as part of the TTX. Subsequently a Master Events List (MEL) was generated from the earlier spreadsheet timeline and was used to establish sequential logic and suggest triggers. This MEL provided the chronological framework for the TTX, relating incidents to consequences, actions and reactions. Swim lanes were refined and used to distinguish threat and response narratives and to track the reaction of key organizational players.

Causal relationships exist in many cases and inform the eventual ordering; however, there is no predetermined 'correct' chronology. Many injects, some of which were introduced more to establish context than to trigger a reaction, can precede or trail others, and the sequence may be significant. As emphasized during the presentation of the scenario at the TTX, the MEL was intended to be illustrative and to provide a contextual backdrop to stimulate discussion and invoke capability requirements. The injects were selected and ordered to situate and promote discussion. They were intended to be predictive, definitive, or deterministic.

Next, the MEL and timeline were transcribed into a narrative. Relating events and telling a story gave life to concepts, and provided the means to acknowledge assumptions.

The intent of a full spectrum scenario is to expand upon the risk identification by taking an event that spans all four EM pillars/phases (Prevent, Prepare, Respond and Recover) and to promote an inclusive consideration of requirements and standing. In practice the risk descriptors, which serve as the capability assessment stimulae, are grounded in the present and usually start with, at best, a brief description of the 'path to crisis' and, more often, a description of the incident and immediate consequences. 'Back casting' (as opposed to forecasting) is an established methodology for exploring preventative and preparedness measures (i.e. identifying policies and programs which would have precluded the incident or mitigated the consequences long before the incident occurred).

¹⁰ Public Health Agency of Canada, Canadian Influenza Pandemic Plan, <u>http://www.phac-aspc.gc.ca/cpip-pclcpi/</u>, Introduction, pg. 8

2.3 Pre TTX Checks (SME Feedback)

Preparations for the TTX included a series of interactions with SMEs. Project objectives were briefed to a full meeting of the PHERA. Members interested in contributing further to scenario and methodology development were formed and briefed separately.

The straw man MEL and scenario narrative generated were passed to interested PHERA members, feedback and inconsistencies addressed and the narrative refined. This review by SMEs helped to ensure credibility and consistency, and to ensure known issues and concerns were addressed.

Two weeks later the proposed methodological approach was briefed to interested PHERA members. This provided a welcome opportunity to clarify, explain and listen. One week before the TTX a 'dry run' was conducted. This included a review of the Participant's Handbook, including agenda, deck and data collection plan, and a walk-through of the proceedings.

These pre-TTX checks provided an important opportunity for the project team to validate and refine the scenario and capability assessment methodology. In effect, this ensured key stakeholders within the HP community had an opportunity to provide their inputs, share perspectives, and to be actively engaged in the scenario development and capability assessment process.

3 Conduct of the TTX

The objectives of the TTX were twofold: to trial "capability assessment"; and to solicit subject matter expertise and assistance to identify capability and task requirements and gaps relating to concerns of the Health Portfolio (HP) to prevent, prepare, respond, and recover from a pandemic event.

3.1 Exercise Objectives and Scope

The objectives and scope for Exercise Perseverance have been laid out in Section 1.1.2 above.

3.2 Location, Site, Duration, Format/Agenda, Facilitation

Exercise (TTX) Perseverance took place in the CSS 11th floor large boardroom. The exercise took place both as a meeting and as a WebEx (with teleconference connectivity). There were approximately 25 participants and 2 facilitators. There were three breaks: morning and afternoon health breaks (at which coffee will be provided); and a 45- minute break for lunch. A detailed agenda which displays the intended exercise flow and the HP Participant List can be found in Annex A.

3.3 Scenario

The scenario for Exercise Perseverance was designed to be illustrative and provide a contextual backdrop to stimulate discussion. Injects were placed in the narrative in order to situate and promote discussion, provide/ensure a shared narrative and invoke ideas about capability needs and gaps.

The general setting for the scenario was set in the near term, January 2014. The scenario indicated that there have been periodic outbreaks of avian influenza detected amongst chickens and reported in South East Asia which are discovered to be caused by a new virus strain. An outbreak of unusually severe respiratory illness in humans follows which is attributable to transmission from chickens to humans. The international community declares a first level Pandemic based on the proven and prevalent inter-species transmission of avian flu. In early June, the WHO reports that the newly named HxNy virus is showing significant and rapid human-to-human transmission. The pandemic flu spreads around the globe and eventually arrives in Canada. A discussion of preparation, response and recovery measures preceded a back-casting exercise in which participants were asked to consider what prevention measures might have been taken 3 to 5 years earlier to mitigate the pandemic.

This full-spectrum scenario (displayed in the table below) was intended to be a tool. It had been designed to elicit expert opinion, and bring forward and focus attention capability needs and gaps in capability across the Whole-of-Government (WoG) during the various stages of a pandemic situation. The remainder of the full spectrum planning scenario is described below in more detail.

CAPABILITY ASSESSM	IENT PROJECT – Modularizet	d FS Scenario (with vign	iettes) 13 June 2013									
							GOVERNANCE					
	DDD/CMT			DDEDADE		00	AMON and ENABLIN	10				perovep
No. timeline	PREVENI	ń		-2	4		•		2	2 2		RECOVER 4
	Pre-Jan 14	Jan-14 Feb-14	Mar-14 Apr - 14	May-14	Jun-14	Jul-14	29 July, 14	Aug-14	Sep-14	Oct-14 Nov-14	Dec-14	Jan-15 Year 2015
	TTX#4	_		TTX#1				Ĕ	(#2			TTX#3
International		It is identified as the cause of many outbreaks of flu a mongst chickens.	Research on the virus commences and a WHO field team is dispatched to the affected area.	Two health care workers (caring for sporadic influenza cases) are reported to have developed influenza-like symptoms.	Local hos pitals and clinics in the region report (via national surveillance system) a large increase in febrile respiratory illness.	The virus appears to affect young adults the most.	<u>~~~</u> 7	teports of outbreaks in Canada prompt some US activists to ternand border closure.	Asia and Europe have mobilized to combat the pandemic.	Several embargoes have been reported.		
Events	Governments at all levels improve governance, law, organization, and policy in order to be prepared for any future pandemic.	As of yet, no evidence of human-to-human transmission has been observed.	Medical authorities identify that all human cases had a history of exposure to chickens.	By end-May, 120 human cases are reported; 33 cases were hospitalized; 12 died within a week.	The CDC completes an initial study, determines that genetics are avian in origin, confirms that virus reflects mutation from previous instantiation.	Mortality rate is estimated to be 18%.	UN UN	Some US customs officers are potted wearing surgical masks.	Mortality rates have risen in some areas to over 12 percent.			
Government of Canada Events	Governments at all levels review governance, law, organization, and policy in order to be prepared for any future pandemic.	Questions arise in House of Commons regarding whether chickens from the affected area are exported to Canada	WHO Member States are informed via the I-HR that all human contracts of the cases are being monitored for illness.	Information on human-to - human transmission is relayed via the I-HR communication channels.		By mid-July, the U.S. notifies Canada of several cases of American nationals that have travelet through Canadian airports while incubating or displaying early signs of liness.	Pandemic enters	By 10 August, local outbreaks are eported in several regions in Canada. Canada doubles efforts to manufacture a vaccine.	Pre-positioning of anti-virals from the MAS/NES stockpiles continues across Canada.	Widespread activity across Canada – clusters of deaths in several provinces.	By 07 December, officials advise that the first shipments of vaccine are underway.	Governments are directed to monitor long term effects by thorough documentation and the establishment of tracking systems of aftermath impacts.
								Canada authorizes wearing of masks by CBSA border personnel. GFIA investigates pet food and possible transfer of sickness to pets.			The Health Products and Food Branch and PHAC promugates regulations concerning devel- opment, regulationy approval, sequence, and admin of vaccines.	
						PHAC and P/Ts report that the NESS has a significant stockpile of antivir als available. The distribution of anti-virals commences.		By the end of August, there is widespread HkNy virus activity across Canada	Top priority for antivirals is assigned to the most vulnerable population (young adults).	Community services and local hospitals are stretched, fatigued, and frustrated.	On 09 December, a mass immunization is initiated.	In early 2015, immunization centres are scaled back and then closed.
Public Health Events			Virus samples are sent to requesting labora tories including the National Microbiology Laboratory (NML) in Winnipeg.			Manufacturers of anthriral drugs have reported that they are "sold out" in several regions in Canada.	Assume antivirals and medical supplies are approved by regulator	Pre-positioning of anti-virals from the NAS/NESS stock piles takes place across Canada.	The Health Portfolio is nominated as Primary Department.		Coincidentally, the number of influenza cases starts to decline, suggesting that the inter-wave period is approaching.	Lessons identified during the recent H7N9 and Coronaviruss are utilized to shape preparation and resonse for future pandemic activity.
PH Events - Vaccine Production					The development of vaccine strains commences at the NML in Canada.	Vaccine Manufacturer provided with seed strain	Federal Government orders vaccine (x million)			HC authorizes vaccine for sale andLot release proceeds.	04 Dec. Vaccine for HxNy has been produced in Canada. HC/PHAC monitor adverse events with antivirals and vaccines	
Public Reaction				Media interest immedately Increases and briefing pace increases.		Canadians are demanding Information regarding what is being done to stop the spread of the virus and what measures are being used to protect Canadians.	-	Wides pread absenteeism from the workplace is reported.	Rumours persist that humans can contract the flu by handling uncooked the flu by handling uncooked the flu by handling plummet. International trade from Stab als backers to consumer Bave liss access to consumer goods and price increases.	People are clamouring for antivirals from ther doctors designe the known shortage. They are outraged that there is no vaccine.	The media ramps up for cross- country information on vaccination.	Business and commerce resumption plans are implemented and recovery efforts increase to find the post pandemic norm at municipal and provincial levels.
								Debate across most provinces concerning re-opening schools. Decided in most provinces to prestrict scotal gatherings. Deby pening of schools until later in fail. There are concerns about the use of chickens in part lood and the affect it may have on household pets.	There are rumours that antivirals and vacines are available from the US, albeit at a prohibitive cost. There are several break-ins at There are several break-ins at	Absenteeion is becoming a critical problem threaten business controutly in businesse from fureral homes to grocery stores.	Public reaction shows appresement.	

Table 1: Scenario Event List

DRDCCSS TR 2013-010

3.3.1 Setting

In January and February of 2014, there have been periodic outbreaks of avian influenza detected amongst chickens and, thus far, occurring in birds only in the rural areas of South East Asia. The World Health Organization (WHO) monitors; notifications are provided to countries through International Health Regulations (IHR) communications. It is discovered that a new virus sub-type (virus strain) is the cause of many of the outbreaks. Questions arise in Canada regarding whether chickens from the affected area are exported to Canada; also, the role of wild birds (migratory) and the danger they pose is questioned.

3.3.2 Assumptions

- The pandemic will result from a new sub-type of influenza A likely originating outside Canada.
- Once infected it takes 1-3 days to develop symptoms.
- The transmissibility of the virus will likely be high; people with influenza are contagious before they develop symptoms up to 7 days afterwards.
- Asymptomatic or minimally symptomatic individuals may still be transmitters.
- A pandemic is likely to arrive in Canada within 3 months (or possibly a much shorter period) of an appearance elsewhere.
- If the pandemic has entered the United States, it is likely to appear in Canada within days.
- The first 'peak' is likely to occur with 2 to 4 months after the virus arrives in Canada.
- Historically pandemics spread in waves each lasting 6 8 weeks. There are likely to be 2 or 3 waves, again each lasting approximately 8 weeks, following the initial outbreak. The second wave will occur 3 to 9 months after the initial outbreak.

3.3.3 Constraints

- This exercise is a proof-of-concept.
- Once validated and refined, the methodology may be extended to other communities and other levels of government. Hence, the capabilities proposed are fairly generic in nature.
- The federal level of activity and capabilities is the primary focus.
- Assessment should be based on current mandates, capabilities, and plans.
- It is recognized that the first pass will need to be reviewed.

3.4 Part 1 - Prepare

In March, 2014, there is an outbreak of unusually severe respiratory illness in humans in one of the SE Asian countries. Medical authorities identify that all human cases had a history of exposure to chickens. WHO Member States are informed that all human contacts of the cases are being monitored for illness and, as of yet, no evidence of human to human transmission of the virus has been observed. Virus samples are sent to requesting laboratories including the National Microbiology Laboratory (NML) in Winnipeg. Research on the virus commences and a WHO field team is dispatched to the affected area. Early in May, a family cluster is identified and two health care workers who have been caring for the sporadic influenza cases are reported to have developed influenza-like symptoms. Notification is sent by the country to the WHO from whom

the information is relayed to other countries via the IHR communication channels. Media interest immediately increases and the pace of briefings to officials increases.

By the end of May, 120 human cases of influenza are reported to the national authority; 33 of these cases were hospitalized, and 12 died within a week. It is now reported that several human cases have not had any contact with poultry and therefore it is suspected that human-to-human transmission chains are being observed. Thus far, the human-to-human transmission appears to be very limited. Cases continue to occur in rural communities clustered in the same geographic region. Numerous live chicken markets have been closed down in the country; however, it appears that both human-to-human and chicken-to-human transmission are still taking place. The WHO sends epidemiologists and lab teams to investigate. Samples of the virus from recent cases are sent to the WHO collaborating centres for further study. In early June, the WHO reports that the newly named HxNy virus is showing significant and rapid human-to-human transmission.

In June, local hospitals and clinics in the region report through the national surveillance system that a large increase in febrile respiratory illness. The CDC completes an initial study of the virus, determines that genetics are avian in origin, and confirms that the virus reflects mutation from previous instantiation. The development of vaccine strains commences.

By July, cases are reported in neighbouring countries. Hong Kong, South Korea, Singapore, and Vietnam report numerous cases, with many occurring in urban settings. The virus appears to affect young adults the most. Mortality rate is estimated to be 18%. Several governments order the culling of chicken farms that have infected birds.

Many Canadians are demanding information regarding what is being done to stop the spread of the virus and what measures are being used to protect the population. Through the summer the pandemic has been spreading into the European Union and Australia, with introductions occurring through international travel hubs. Border measures in various countries are implemented.

By mid-July, the U.S. has notified Canada of several cases of American nationals that have travelled through Canadian airports while incubating or displaying early signs of illness. Canada activates the EOC now that cases have been reported in North America. The U.S. reports the first cases of the HxNy virus by late July.

Meanwhile, the manufacturers of antiviral drugs have reported that they are "sold out" in several regions in Canada, although PHAC and the P/Ts report that the National Emergency Stockpile System have a significant stockpile of antivirals available. Planning for pre-positioning of antiviral stocks commences. There are single deaths reported in the U.S. and efficient human to human transmission taking place. The Federal, and some provincial, territorial, and municipal governments in Canada activate their pandemic plans. The F/T/P escalate the function of the Portfolio (i.e., Regional/Provincial and Municipal) Emergency Operations Centre and accelerate the purchase of personal protective equipment, personal hygiene products, and anti-flu medications. The following bubble (blue) displays Question Set #1 given to participants.

Given your organizational responsibilities:

- What are the key triggering events?
- What capabilities and tasks do these invoke (Identify crosssectorial dependencies (external enablers))?
- How well are you positioned to satisfy these capability and task requirements?
- What is the nature of any gap (i.e., people, process, technology)?
- How serious is the gap and what is the aggregate risk?

Question Set #1

3.5 Part 2 - Respond

On 29 July, 2014, the first cases of the HxNy virus are detected in Canada. The pandemic virus is traced to several individuals in British Columbia. There are concerns about the use of chickens in pet food and the affect it may have on household pets. There is a CFIA investigation of poultry in BC to verify that pet food is not affected. By 10 August, local outbreaks of human cases of the virus are reported in several regions in Canada. Chilliwack, BC reports that 32 people have been hospitalized and 3 people died overnight on 13 August. The government distribution of anti-virals commences.¹¹ Canada doubles efforts to manufacture an effective vaccine as quickly as possible.

By the end of August, there is widespread HxNy virus activity across Canada and widespread absenteeism from the workplace. The government of Canada considers declaring a national health emergency. A heated debate across most provinces takes place concerning the re-opening of schools after the summer holidays. It is decided in most provinces to restrict social gatherings and delay the opening of schools and universities until later in the fall. International trade from SE Asia has decreased dramatically with cargo ships staying clear of Vancouver harbour. Canadians discover that they have less access to consumer goods, equipment and food that they are accustomed to, and the price of goods has increased significantly.

Reports of outbreaks in Canada prompt some US activists to demand border closure. Some US customs officers are spotted wearing surgical masks. In response, Canada authorizes the wearing of masks by CBSA border personnel and authorities commence wearing of masks in late August. Local pharmacies have run out of antivirals and are unable to keep up with demand for disinfectants, surgical masks, and flu remedies. Pre-positioning of anti-virals from the NAS/NESS stockpiles takes place across Canada. The public is advised that it could take up to 6

¹¹ Health Canada's Biologics and Genetic Therapies Directorate (BGTD) is the Canadian federal authority that regulates biological drugs (products derived from living sources) and radiopharmaceuticals for human use in Canada, whether manufactured in Canada or elsewhere, *including bacterial and virus vaccines*.

months to produce and distribute a vaccine to counter the HxNy virus. Antivirals from the NAS/NESS stockpiles are transported and distributed to Aboriginals communities, police, prison guards, and prisoners by federal order and priority assigned to the most vulnerable population (young adults).

By September, the pandemic is still spreading globally. Asia and Europe have mobilized to combat the pandemic. Mortality rates have risen in some areas to over 12 percent. The U.S. is now experiencing clusters of deaths across all parts of the country and is reporting progress on a vaccine against the new virus.

The Emergency Measures Act is invoked and a Federal Coordinating Officer is named. The HP is nominated as Primary (Lead) Department. A number of senior GoC officials are stricken with the HxNy virus. There are rumours that antivirals and vaccines are available from the US, albeit at a prohibitive cost. There are several break-ins at pharmacies reported in a number of major cities. Rumours persist that humans can contract the flu by handling uncooked meat – poultry sales plummet. By the end of October, the infection rates are increasing. It is estimated that as much as 20-40% of the population is infected, half of those requiring out-patient care, and 5-6 % requiring hospitalization. Mortality rates in some areas are as high as 15-18 people per 100 infected people. Absenteeism is becoming a critical problem threatening business continuity in businesses from funeral homes to grocery stores. People are clamoring for antivirals from their doctors despite the known shortage. They are outraged that there is no vaccine. Community services and local hospitals are stretched, fatigued, and frustrated.

By 07 December, officials advise that the first shipments of vaccine are underway. The Health Products and Food Branch of PHAC promulgates regulations concerning development, regulatory approval, sequencing, and administration of the vaccine. The media ramps up for cross-country information on vaccination. On 09 December, a mass immunization is initiated. Coincidentally, the number of influenza cases starts to decline, suggesting that the inter-wave period is approaching. The need to address special populations, including Aboriginals for future pandemic activity is a priority. Lessons identified during the recent H7N9 and Coronavirus are utilized to shape preparation and response policies. The following bubble (blue) displays Question Set #2 given to participants.

Given your organizational responsibilities:

- What are the key triggering events?
- What capabilities and tasks do these invoke (Identify crosssectorial dependencies (external enablers))?
- How well are you positioned to satisfy these capability and task requirements?
- What is the nature of any gap (i.e., people, process, technology)?
- How serious is the gap and what is the aggregate risk?

Question Set #2

3.6 Part 3 - Recover

In early 2015, immunization centres are scaled back and then closed. Governments are directed to monitor long term effects by thorough documentation and the establishment of tracking systems of aftermath impacts. Business and commerce resumption plans are implemented and recovery efforts increase to find the post-pandemic norm at municipal and provincial levels. Lessons identified at all levels are analyzed and brought forward into the policy and legislative flow to promote continuous improvement in the management of beyond limits catastrophes. The following bubble (blue) displays Question Set #3 given to participants.

Given your organizational responsibilities:

- What are the key triggering events?
- What capabilities and tasks do these invoke (Identify crosssectorial dependencies (external enablers))?
- How well are you positioned to satisfy these capability and task requirements?
- What is the nature of any gap (i.e., people, process, technology)?
- How serious is the gap and what is the aggregate risk?

Question Set #3

3.7 Part 4 - Prevent

Canadian governments at all levels share responsibility for prevention and mitigation. Typical activities associated with prevention and mitigation include formulating policies, negotiating mutual aid agreements establishing governance structures and regulatory regimes. The intent is, insofar as possible, to avoid events and reduce impact. Back-casting is the reverse of forecasting and offers an established methodology for exploring preventative and preparedness measures. It was logical to conclude with a back-casting exercise. At this stage participants were familiar with existing challenges and were asked to reflect on how these could have prevented or incident consequences mitigated. To play Prevent first would be to risk compromising identifying existing requirements and relating to the other three pillars. The following bubble (blue) displays Question Set #4 given to participants.

- Look back. Think about how things could have been shaped.
- What could have been done (5 years ago) to Prevent or Prepare better for a pandemic?
- How could we have mitigated today's problems?
- What can we do now to reduce impacts of a future pandemic?
- What capabilities and tasks do these invoke (Identify crosssectorial dependencies (external enablers))?
- How well are you positioned to satisfy these capability and task requirements?
- What is the nature of gaps (i.e., people, process, technology)?
- How serious is the gap and what is the aggregate risk?

Question Set #4
4 Findings

Following the TTX, all the participants' audits/assessments were collected and collated. Preparing one sheet for capability assessment as a participant worksheet for each EM pillar proved prudent and facilitated collation and analysis. Changes to the task inventory were discussed at the TTX, and some were agreed to on the spot. Suggested additions to capability elements were noted on the spreadsheets and then entered following the TTX. Inputs from Regions and First Nations and Inuit Health Branch (FNIHB) were received after the TTX and their input was added to the mix. This permitted a comparison between the two inputs. Whereas the regions' input reflected and reinforced the TTX results, the FNIHB assessment differed noticeably. Their assessment revealed less confidence overall in existing capabilities, specifically they gauged many capabilities to have serious shortfalls. In some cases, this perception altered aggregate assessments. While caution must be exercised when extrapolating and drawing conclusions outside of the results from the TTX, it also suggests that this divergence is worth exploring and perhaps should inform investment plans.

Participants were encouraged to complete assessments only for those tasks which they felt competent to evaluate. This extended to capability elements; hence, there are uneven numbers of responses in the various line items. A specific 'rule set' for coding and cataloguing the results had not been fully established prior to the TTX. In conducting the analysis, and as reflected in the presentation, it was agreed that the majority should prevail. For example, if six participants rated a task Green and two rated a task as Yellow, an overall rating of Green was applied. The PHERA chair's (prime sponsor) evaluations were noted (in red after the black scores of participants) and used to 'break ties.' These red notations are repeated numbers; that is, the PHERA chair's score is included in the black scores and then repeated (but not scored) as a red tie-breaker. Participants were invited to explain their evaluation, particularly gaps, by adding comments in the notes columns in the worksheets. These also informed aggregate evaluations. As can be seen, in some instances, it was impossible to assign an overall rating. The range of responses suggests that additional investigation and assessment is warranted; outliers may reflect unique knowledge and/or task interpretation. Therefore, in Delphi fashion, further discussion and a second round of voting would be appropriate. As there was no time allotted for this second review and assessment, the client would have to take the responsibility for this step after the fact. For the most part, the analysis indicated a strong sense of consensus within the HP community, and an increasing comfort level with the methodology as the TTX progressed. It should be noted that the results discussed below originate from the exercise involving the collective opinions of SMEs involved in an exercise.

4.1 Results

4.1.1 Prepare

The initial TTX assessment session focused on the EM pillar 'Prepare.' In reviewing the task inventory, the importance of distinguishing between antivirals and vaccines was noted. It was observed that it is impossible to maintain a stockpile of vaccines prior to a pandemic event; therefore, reference to vaccines was removed from the task descriptions on the Prepare

worksheet. A discussion of several (preselected) tasks and debate about how the scoring criteria should be applied preceded the completion of the assessment worksheets. The participant assessments were conducted individually. Participants were invited to record the rationale behind their aggregate assessments using the worksheet Notes column. An example of the comments received and recorded (on the right hand side of the table) is depicted below (Table 2). The TTX results for "Prepare" are shown at Table 3.

	Capability Elements			Overall Assessment		
Health Portfolio Tasks	Policies, People Policies, Processes & Practices Infrastructure, Technology, Capability Criticality		Criticality	Notes		
Establish mutual aid agreements	6G 3Y	3G 6Y	4G 5Y	4G 5Y	1L 6M 3H	Slow decisions. Well-ensconced committees. Potential delays in decision for deployment etc. Affects Canada's reputation and influence.
Establish incident management governance structure and decision processes	7G 3Y 1R	8G 2Y 1R	5G 5Y	6G 3Y 1R	2M 9H	HP prolonged approval process. Plans exist but people need practice. Established groups experience with respect to other events.
Assess Risk	6G 1Y	6G 1Y	4G 3Y	7G 1Y	2M 6H	Early risk assessment - but non-scientific. Well- ensconced committees. Step in the HPERP. Guides the pace of response.
Develop and maintain pandemic response contingency (interventions) and communication plans. Set immunization guidelines.	6G 3Y	6G 3Y	7G 2Y	7G 2Y	3M 6H	Staff turnover is an issue. Promotes all hazard preparedness and cross-govt and non-govt communities.
Identify Critical business processes and publish SOPs	5G 5Y	5G 5Y	5G 4Y 1R	5G 5Y	2L 4M 4H	SOPs less important than"identifying critical businesses processes. Well performed. Low during this phase.
Preplan responses and develop templates	6G 4Y	6G 4Y	6G 3Y 1R	6G 4Y	3L 3M 4H	Preplanning highly important templates ideal but not critical.
Develop information and intelligence vertical and horizontal sharing protocols (i.e. within GC, with P/T/M, with private partners and with global community)	10G 3Y	9G 4Y	10G 3Y	9G 4Y	5M 8H	We have tools problem is the policy or people not cooperating. Good position across all elements. Need better F/P integration plus FN identifier. Have mostly paper-based systems. Senior protocols established and understood. Clarify protocols for sharing of information. Need better integration with fed/prov and First Nation identifier. Mostly paper- based system. You get the information you may need because we have good relationship with the regions, but no great surveillance in place. Not interoperable and no First Nation identifier reporting.
Determine information requirements/reporting thresholds (Indicators & Warning levels)	8G 2Y	7G 2Y	6G 3Y	7G 2Y	3M 7H	Been done in H1N1, MRS, H2N9 etc. This is communication of critical triggers for action. Need to set requirements and get agreement in this space. Data sharing and First Nation denominator. Still on paper-based system.

Table 2: Prepare Results: Sample Comments Received

	C	apability Elemen	Overall Assessment		
Health Portfolio Tasks	Organization & People	Policies, Processes & Practices	Infrastructure, Technology, and Tools	Capability	Criticality
Establish mutual aid agreements	6G 3Y	3G 6Y	4G 5Y	4G 5Y	1L 6M 3H
Establish incident management governance structure and decision processes	7G 3Y 1R	8G 2Y 1R	5G 5Y	6G 3Y 1R	2M 9H
Assess Risk	6G 1Y	6G 1Y	4G 3Y	7G 1Y	2M 6H
Develop and maintain pandemic response contingency (interventions) and communication plans. Set immunization guidelines.	6G 3Y	6G 3Y	7G 2Y	7G 2Y	3M 6H
Identify Critical business processes and publish SOPs	5G 5Y	5G 5Y	5G 4Y 1R	5G 5Y	2L 4M 4H
Preplan responses and develop templates	6G 4Y	6G 4Y	6G 3Y 1R	6G 4Y	3L 3M 4H
Develop information and intelligence vertical and horizontal sharing protocols (i.e. within GC, with P/T/M, with private partners and with global community)	10G 3Y	9G 4Y	10G 3Y	9G 4Y	5M 8H
Determine information requirements/reporting thresholds (Indicators & Warning levels)	8G 2Y	7G 2Y	6G 3Y	7G 2Y	3M 7H
Establish SME communities and IT networks	9G 2Y	8G 3Y	7G 4Y	9G 2Y	5M 6H
Determine training requirements	5G 3Y 2R	4G 5Y 1R	4G 4Y 2R	4G 4Y 1R	1L 6M 3H
Train, qualify and position HP personnel	1G 8Y 1R	3G 7Y	2G 6Y 2R	1G 7Y	1L 5M 4H
Identify and protect critical infrastructure, including supply chains. Prepare mass campaign infrastructure.	3G 4Y	2G 5Y	3G 3Y	2G 4Y	1L 1M 4H
Maintain stockpiles of anti-virals	6G 2Y	6G 2Y	4G 4Y	5G 3Y	2M 6H
Develop tailored/targeted public education & awareness program	8G 1Y	6G 3Y	7G 1Y 1R	8G 1Y	2L 3M 4H
Establish readiness posture. Maintain capability inventory.	3G 4Y 1R	4G 4Y	3G 4Y 1R	3G 5Y	5M 3H
Maintain immediate/emergency response teams	2G 5Y 2R	4G 5Y	4G 5Y	2G 7Y	2L 4M 2H
Develop and conduct training/exercise/rehearsal programs. Cross-train workers.	7G 2Y 1R	6G 4Y	5G 4Y	7G 3Y	7M 3H
Validate operational, contingency and business contingency plans	3G 5Y 2R	3G 5Y 2R	4G 3Y 2R	2G 6Y 2R	1L 3M 6H
Provide Early Warning - epidemiology surveillance, investigation, alerting and pre-position	7G 2Y	6G 3Y	4G 5Y	7G 2Y	9Н
Identify/address preparedness shortfalls	7G 3Y	7G 3Y	8G 2Y	7G 3Y	6M 3H
Federal regulation in place for approval of drugs and vaccines during a pandemic (EUNDS)	1G	1G	1G	1G	1H

Table 3: Prepare Findings

Notably, the HP community rated most tasks as being highly important and the rest of medium importance. Secondly, no critical shortfalls (overall Red) were identified in the Prepare worksheet. The preponderance of Green (13 out of 21 tasks) attests to confidence in existing capabilities for the Prepare stage in the Health Portfolio (e.g., establishing information exchange

protocols and maintaining stockpiles of antivirals). However, several potentially serious gaps (6 Yellow) were identified. The first two relate to managing relationships and the establishment of mutual aid agreements and incident management governance. TTX discussion affirmed that there is a divergence of views as to how well-established Integrated Management System (IMS) structures and processes are. It was suggested that inter-sectorial exposure and practice would be particularly useful to remedy this gap. The third gap relates to managing Human Resources. The results reflect concerns over the identification and determination of training requirements and HR record keeping, and the organization, policy and tools for training, qualifying and positioning of HP personnel. Establishing readiness posture and maintaining immediate/emergency response teams were also identified as concerns. Lastly, assessments diverge as to how frequent and how well plan validation is being is being conducted. In this case it is suspected that the range of opinion reflects organizational diversity and priorities (e.g. it was suggested that the range of continuity Plan (BCP) requires renewal).

Variances in the Prepare pillar were apparent. Most variances related to governance and common/enabling capabilities, and the need to maintain an incident response capability -although the variances were not overly significant. There were also variances related to the tasks required to establish an incident management governance structure and decision process when compared to other scores obtained. Table 3 shows some variability around determining training requirements along with the need to validate operational, contingency, and business continuity plans, with several scores scattered among Green, Yellow, and Red. Most of these tasks were rated as highly critical, except for determining training requirements, which was assessed as Moderate for criticality. Tasks that fell into the 'Grey zone' in terms of criticality included the identification of critical business processes and publishing SOPs, and pre-planning responses and Participants from Health Products and Food Branch (HPFB) drew developing templates. attention to the amendments to the Food and Drugs Regulations (FDR) that include a specific regulatory pathway for the authorization of new drugs under extraordinary circumstances (Extraordinary Use of New Drugs – EUNDs). The goal of the regulations is to provide Canadians with access to extraordinary use new drugs which have undergone a pre-market review for quality, safety, an efficacy despite limited clinical safety and effectiveness in the post-market phase.

4.1.2 Respond

The second assessment session focused on "Respond." To start off the session, attention was drawn to the task inventory. The distinction between antivirals and vaccines was reiterated. In the case of the Task "Produce/procure antivirals and vaccines", vaccines were removed from this particular box on the worksheet to leave antivirals on their own. A new box with "Produce/procure vaccines" was added at the bottom of the respond spreadsheet (Table 4). There are a number of "managing materiel" tasks relating to production/procurement, staging/storing and allocating/administering medical countermeasures which will require review to ensure appropriate separation. During the TTX, participants were invited to enter manually (using one of the spare rows at the bottom of the worksheet) a separate task relating to monitoring the vaccine production/procurement. Additionally, two tasks relating to monitoring the effectiveness (and adverse drug reactions) of antivirals and vaccines respectively were agreed upon and added at the bottom of the worksheet. The results of the Respond capability assessment are shown below (Table 4).

	Capability Elements			Overall Assessment	
Health Portfolio Tasks	Organization & People	Policies, Processes & Practices	Infrastructure, Technology, and Tools	Capability	Criticality
Establish/activate incident management governance structure and decision processes	4G 2Y 1R	5G 2Y	4G 3Y	5G 3Y	8H
Establish/activate consequence management governance structure and decision processes	4G 2Y	4G 2Y	2G 4Y	3G 4Y	1M 5H
Conduct rapid assessment - identify, characterize and	7G 2Y	7G 2Y	8G 1Y	7G 1Y	9Н
evaluate (specific) risks Recommend cases and control management measures. Set immunization priorities. Consult, develop, and coordinate	4G 4Y	5G 2Y 1R	6G 2Y	4G 3Y	1L 7H
Implementation of Incident Action Plans.	5G 2Y	5G 2Y	3G 4Y	3G 5Y	8H
Share information with poors and partners, Manage data	5G 1Y	5G 2Y	4G 2Y	4G 2Y	6Н
	4G 1Y	3G 2Y	4G 1Y	3G 2Y	1M 4H
Develop, test and authorize vaccine (medical	4G 2V	4G 2V	46.28	46.28	214 41
countermeasures)	40.21	4021	40.21	4021	2101 411
Produce/procure antivirals	7G 1Y	7G 1Y	6G 2Y	4G 2Y	6H
Receive, stage and store antivirals and vaccines	5G 2Y	5G 2Y	5G 2Y	4G 3Y	7H
Allocate and administer antiviral and vaccine distribution	4G 2Y	4G 2Y	4G 2Y	3G 3Y	1M 5H
Augment information collection, analysis and EOC staffs	2G 4Y 1R	3G 3Y	4G 2Y	3G 3Y	1M 4H
Manage Primary Health Care Workers (Surge & Sustainment)	3Y 1R	1G 3Y	3Y	3Y	3H
Manage Public Health Care Workers (Surge and Sustainment)	4Y 1R	1G 3Y	1G 3Y	5Y	5H
Notify internal authorities and partners	6G 1Y	6G 1Y	6G 1Y	6G 1Y	8H
Public Communications and Alerting	6G 3Y	7G 2Y	7G 2Y	6G 3Y	1M 8H
Maintain epidemiological surveillance. Monitor threat alerts & advisories (Warning & Indicators)	5G 1Y	5G 1Y	4G 2Y	4G 1Y	4H
Detect trends and anomalies	5G 1Y	5G 1Y	4G 2Y	5G 1Y	6H
Investigate and characterize events/incidents (epidemiological investigation, deployable capability, lab testing, rapid assessment)	4G 1Y	4G 1Y	4G 1Y	4G 1Y	1M 4H
Confirm/Verify incident/attack	2G 2Y	3G 1Y	2G 2Y	2G 2Y	1M 4H
Direct tactical operations e.g. First Responders, Case and Contact Management	1G 2Y	1G 1Y	2G 1Y	1G 2Y	1M 2H
Conduct emergency triage and pre-hospitalization	2Y	1G 1Y	1G 1Y	2Y	2H
Secure the site. Contain and control the incident/attack (Isolation, Quarantine)	1G 1Y	1G 1Y	1G 1Y	1G 1Y	2Н
Dispose of hazardous material (devices)	2G 1Y	2G 1Y	2G 1Y	2G 1Y	3H
Preserve (e.g. provide guidance) responder health and safety	3G 1Y	3G 1Y	3G 1Y	3G 1Y	4H
Monitor on scene response	2G 1Y	1G 2Y	2G 1Y	1G 2Y	3Н
Liaise with peers and partners. Focus and direct multi-agency collaboration.	3G 2Y	3G 2Y	4G 1Y	4G 1Y	1M 4H
Maintain public order	1G 2Y	2G 1Y	2G 1Y	1G 2Y	ЗН
Mitigate consequences, implement disease control strategies	3G 1Y	3G 1Y	3G 1Y	4G 1Y	5H
Evacuate, shelter/shelter-in-place and feed citizens	2Y 1R	2Y 1R	2Y 1R	2Y 1R	1L 2H
Manage fatalities	3G 1Y	3G 1Y	3G 1Y	3G	1L 1M 2H
Produce/procure vaccines	3G 1Y	4G	3G 1Y	2G 1Y	1M 3H
Monitor effectiveness (and adverse effects) of vaccines	1G 2Y	1G 2Y	1G 2Y	1G 2Y	3H
Monitor effectives of (adverse drug reactions) antivirals	2G 1R	2G 1R	2G 1Y	2G 1R	3H
Monitor effectiveness of programs	1Y	1Y	1Y	1Y	1H
Monitor market for counterfeit antivirals and communicate to the public.	1Y	1Y	1Y	1Y	1H

Table 4: Respond Findings

The preponderance of Green (21 out of 36 tasks) is reassuring. It seems reasonable to conclude that after several important brushes with potential pandemic situations (e.g., H1N1, Coronavirus, and H7N9), both Prepare and Respond pillars of EM have been worked through and improved in the last couple of years; thus, there is more confidence with the system that has been set in place in Canada, and there is a broad understanding of capabilities, roles and responsibilities, and structures associated with responding to emerging pandemics. Notably, the HP community rated most tasks as being highly important; all but two tasks where there is divergent opinion. The small number of unresolved areas (Grey boxes) demonstrates the high degree of agreement of participants. Hence, the assessment reflects a solid collective opinion. Predictably, no critical shortfalls (overall Red) have been identified in the Respond worksheet.

There are, however, numerous potentially serious gaps that have been identified (13 Yellow). Concern was raised with respect to consequence management; keeping in mind a distinction was made between incident and consequence management. The ability to access and exploit specialist expertise, especially in the infrastructure, technology, and tools capability element, is found to be wanting. The ability of the HP to augment (surge) information collection, analysis, and EOC staffing in the Respond phase is seen to be a serious gap in the people and organization and policies, processes, and procedures capability elements. Both managing primary health care workers and public health care workers for surge capacity and sustainment during the Respond stage of a pandemic are seen to be uniformly serious gaps across all capability elements. Although directing "front line/tactical operations" is not a predominant concern for many (as reflected by the small response set in the worksheets), it is for those charged with responsibilities for First Nations and Federal populations. Capabilities relating to directing tactical operations, conducting emergency triage and pre-hospitalization, monitoring on-scene response, maintaining public order, and evacuating, sheltering and feeding citizens, were identified as serious gaps. Monitoring effectiveness (and adverse effects) of vaccines is seen to have serious gaps across all capability elements. Finally, the participants from Health Canada were alone in the assessment (because this is not a PHAC mandated item, but a FNIHB item) that both "monitor effectiveness of programs" and "monitor markets for counterfeit anti-virals and communicate to the public" had serious gaps across all capability elements. CBSA, who would likely have a role in monitoring counterfeit products, was not consulted for this exercise.

4.1.3 Recover

During the Exercise Perseverance hot-wash-up, there was some discussion about whether it was worthwhile dedicating a separate focus session on Recover activities. The argument posited was that it was sometimes difficult to delineate between Respond and Recover. During an event and in hindsight, it was unreservedly a good idea to draw a distinction between the two capability groups. Participants noted that little staff effort has heretofore been focused on the Recover pillar of EM within the HP.

The one significant change to the task inventory was to note that the HP would not be so much involved in developing recovery plans, but more in adjusting and implementing recovery plans. There was little to add to the capability inventory reflecting that there are few, if any, standing organizations, processes and/or tools devoted to Recover. It was clear that there was a dearth of "lessons learned" documentation pertaining to Recover from past experience in HP. Although there may have been few prior examinations on which to base assessments, the TTX participants

did not have significant difficulty completing the worksheets for the Recover stage. The results were collated and are shown below (Table 5).

		Capability Elements	Overall Assessment		
Health Portfolio Tasks	Organization & Policies, Process People Practices		Infrastructure, Technology, and Tools	Capability	Criticality
Establish recovery management governance structure and decision processes	4G 3Y	4G 2Y 1R	5G 2Y	4G 2Y	1L 2M 3H
Identify and track long term health effects	2G 4Y	1G 6Y	1G 5Y	5Y	1L 1M 3H
Restore community trust	2G 2Y	2G 1Y 1R	2G 1Y 1R	2G 1Y 1R	1M 3H
Adjust and implement plans to restore HP services and capabilities and contribute to economic and community recovery	2G 6Y	1G 6Y	4G 4Y	1G 7Y	1L 5M 2H
Manage data, information, intelligence and knowledge	4G 1Y	4G 1R	4G 1R	4G 1Y 1R	1L 1M 3H
Demobilize surge/sustain resources (including deactivation of volunteers as required)	2G 6Y	2G 6Y	4G 5Y	2G 6Y	2L 5M 2H
Address and administer compensation	3G 4Y	3G 3Y 1R	3G 2Y 2R	3G 3Y 1R	4M 2H
Dispose of used/contaminated materiel	5G	5G	5G	5G	1L 2M 2H
Recover unused materiel	4G, 2Y	4G 1Y 1R	4G 2Y	4G 2Y	2L 3M 1H
Refurbish/replace equipment. Restock NESS.	7G	7G	7G	6G 1Y	1L 1M 4H
Re-establish community trust	3G 1Y	3G 1Y	3G 1R	3G 1Y 1R	1M 3H
Restore HP services and capability	2G 5Y	3G 2Y 1R	3G 2Y 2R	3G 2Y	1L 2M 3H
Provide long teerm care and assistance	1G 4Y	1G 3Y	1G 3Y	1G 3Y	1L 1M 3H
Conduct post-incident/event analysis.	10G	10G	9G 1Y	9G	1L 4M 3H
Identify and share Prevent/Prepare mitigation measures	8G	6G 2Y	8G	6G 1Y	1L 2M 3H

Table 5: Recover Findings

As illustrated in Table 5, there is a general consensus within the HP community. Of note, the community ratings are more diverse in the criticality column, most tasks being rated either unresolved, medium, or highly important. Again, no critical shortfalls (overall Red) have been identified on the Recover worksheet. Nine out of 15 Recover-related tasks were rated satisfactory (Green); and one task (restoring community trust) was unresolved. In general, the HP community has concerns centering on identifying and tracking long term health effects including post-traumatic stress and provision of long term care, adjusting and implementing plans to restore HP services and capabilities, and managing human resources including demobilization and compensation. Recovery planning was recognized as a government (if not societal) wide challenge.

As indicated, there were variances recorded mainly in the governance and enabling/common capability groups. For the HP community, the variances were apparent in the policies, processes,

and practices, as well as infrastructure, technology, and tools capability elements. On the other hand, the overall criticality of the Recover pillar was assessed as moderate. In addition, six out of 15 tasks were assessed as 'unresolved' in terms of their criticality, with a wide variance of ratings for each capability grouping. Restoring community trust was assessed as critically important, yet there is some variance within the HP community with respect to how serious this poses a capability deficiency.

4.1.4 Prevent

Participants understood, but were less comfortable with, the notion of 'back casting.' The scenario may not have provided sufficient detail to identify specific issues. Nonetheless, there was some very useful discussion about the Prevent pillar -- and the use of research & development as an illustrative capability generated a high level of interest. Table 6 displays the results below.

	Capability Elements			Overall Assessment	
Health Portfolio Tasks	Organization & People	Policies, Processes & Practices	Infrastructure, Technology, and Tools	Capability	Criticality
Establish accountability framework	4G 2Y	2G 3Y	3G 2Y	4G 1Y	1L 2M 2H
Establish policy formulation governance structure and decision processes	5G 2Y	5G 2Y	5G 2Y	5G 2Y	2M 4H
Define/clarify HP organizational mandate and structure, roles & responsibilities	6G 2Y	6G 2Y	7G 1Y	6G 2Y	2M 6H
Inform international governance structure and legal regime	6G 2Y	6G 2Y	6G 2Y	6G 2Y	1L 4M 3H
Arrange appropriate public/private partnering	3G 1Y 1R	3G 1Y 1R	4G 1Y	3G 1Y 1R	1L 2M 2H
Establish/oversee employment of risk framework	4G 1Y 1R	4G 1Y 1R	4G 2Y	4G 1Y 1R	4M 3H
Balance Investment and allocate resources according to priorities (across EM stages and capabilities)	2G 4Y	2G 4Y	3G 3Y	2G 3Y	2M 3H
Develop and publish national Health Portfolio Public Safety/Security strategy	5G 1Y	5G 1Y	5G 1Y	4G 1Y	2M 3H
Develop ontologies, information and intelligence sharing protocols	4G 2Y	3G 3Y	3G 3Y	3G 3Y	1M 5H
Establish information and intelligence collect priorities	2G 3Y	2G 3Y	2G 3Y	2G 3Y	4M 1H
Determine HP human resource requirements	1G 2Y 1R	3G 1Y 1R	2G 3Y	2G 2Y 1R	2M 3H
Recruit/develop specialists	1G 2Y 2R	1G 2Y 2R	1G 3Y 1R	1G 2Y 2R	1M 4H
Establish HP infrastructure and laboratories	5G 2Y	6G 1Y	6G 1Y	6G 1Y	1M 6H
Develop and maintain public outreach program i.e. public education & awareness	3G 2Y	3G 2Y	3G 2Y	3G 2Y	2M 3H
Define liabilities and regulatory regimes (e.g accreditation)	ЗҮ	ЗҮ	ЗҮ	ЗҮ	1M 1H
Enact enabling legislation	1G 2Y	1G 2Y	1G 2Y	1G 2Y	2M
Publish standards and certifications	1G 2Y	1G 2Y	1G 2Y	1G 2Y	2M 1H
Establish stockpile and production criteria	5G 1Y	4G 2Y	5G 1Y	5G 1Y	1M 5H
Identify, understand existing/emergent	2G 3Y	4Y 1R	3Y 2R	3Y 2R	1M 5H
Identify, understand social behaviour	1G 2Y	1G 2Y	1G 2Y	1G 2Y	1M 2H
Establish centres of excellence and testbeds	1G 2Y	1G 2Y	1G 2Y	1G 2Y	2M 1H
Establish objectives, metrics and auditing process	1G 2Y	1G 2Y	1G 2Y	1G 2Y	1L 1M 1H

Table 6: Prevent Findings

Once again, there is general consensus within the HP community; and there were few unresolved assessments. Most tasks being rated either medium or highly important with the criticality of four tasks being unresolved. The results indicate that there are numerous tasks of high importance which are being done well, an example being establishing stockpile and production criteria. Conversely recruiting/developing specialists is acknowledged to be a task of high importance, but this task is the sole activity in the TTX that was deemed to present a critical gap (Overall Red – meaning Red in the first two capability elements, Yellow in infrastructure, technologies, and tools). There were 10 tasks where Yellow or serious shortfalls identified. The ability to balance investment and allocate resources according to priorities is seen to have serious gaps in the people and organization and policies, processes, and procedures capability elements. Next, the ability to develop ontologies and information and intelligence protocols is seen to have serious gaps in policies, processes, and procedures and infrastructure, technologies, and tools capability elements. Also, the ability to define liabilities and establish regulatory regimes (e.g. accreditation) and publish standards and certifications was judged to have serious gaps across all capability elements. Finally, research & development, and specifically identifying and understanding existing/emergent opportunities, is also considered a task of high importance and one that presents a serious gap (bordering on critical, given several red ratings).

Although for most tasks consensus was quite evident, there was some variability surrounding tasks related to the ability to arrange appropriate public/private partnering and to establish/oversee employment of risk framework. In addition, the ability to determine HP human resource requirements was an area that was viewed by participants as unresolved.

4.2 Capability Groupings

A cross-capability grouping was conducted as part of the analysis and is shown below (Figure 7). There is a small and relatively constant level of unresolved task assessments across capability groups. As noted earlier, most capabilities in each capability group are assessed to be adequate (i.e. Green). There are assessed to be a number of serious gaps in each capability group, suggesting a targeted, holistic, and balanced investment approach is warranted. Many of the concerns relate to HR and Figure 8 shows that Prevent needs more attention – it has relatively more serious gaps and the one critical gap (i.e. Red) that the participants identified. Many of the serious gaps identified relating to Respond focus on the provision of front-line services (First Nations and Federal populations).



Figure 7: Overall Capability Assessment Findings Across EM Pillars

4.3 Common/Enabling and Governance

Although task specifics vary, the governance and common/enabling capabilities span Prevent /Prepare/Respond and Recover groupings. Figure 8 illustrates the distribution of governance and common tasks across the other capability groups. As can be seen, more governance-related tasks have been identified related to Prevent and Prepare compared to Respond and Recover. This seems logical that governance is about laying the foundation for decision-making. By means of comparison, the distribution of common/enabling tasks is both more comprehensive and more evenly spread. A few more tasks have been identified relating to Prepare and Respond – probably a reflection of these capability groups being better defined. It is noteworthy that the number of common/enabling tasks alone exceeds the number of all the other capability group tasks (Figure 9).



Figure 8: Task Distribution



Figure 9: Number of Tasks

Figure 10 provides a different perspective by separating out governance and common/enabling capabilities prompting several observations. Firstly, there are no unresolved capability assessments relating to Prevent, Prepare, and Recover, Common is not only the largest capability group but is also well-positioned with a preponderance of Green task assessments (as is the case with governance); but common/enabling is also the only capability group with a critical shortfall (i.e. Red). The majority of Prevent tasks are judged to have serious shortfalls. Whereas, Prepare and Respond have a roughly equal number of adequate capabilities and serious shortfalls. Secondly, the Public Health Community may be accepting a degree of risk in structuring its capability elements primarily to deal with a response an evolving pandemic event. The challenge in preventing/mitigating and recovering from the consequences of a pandemic event with global ramifications may limit the opportunities and options available to identify key capability areas of direct concern to Canada (and others in the international community. One issue is that the Public Health Community may be forced to rely on the capacity of other countries and international organizations to provide capabilities in the Prevent and Recover, which will place a premium on collaboration, communication, partnerships and engagement strategies. Thirdly, there is the issue of federal-provincial relations. Health care is a provincial responsibility, and the need for the federal government to provide a cross-government, multi-agency and holistic response to a pandemic crisis because could place an added burden on hospitals and stress relationships. Again, this augurs for a balanced and targeted investment strategy across EM pillars. It also highlights the importance investing in those capabilities that will likely have the greatest cumulative impact in terms of their ability to help the HP community respond to events across the Prepare, Prevent, Respond, and Recover pillars.



Figure 10: Aggregated Findings Across Governance and Common/Enabling

4.4 Capability Elements (PPT)

The following figures display the analysis of capability elements (PPT: People and Organization; Policy, Processes and Procedures; Infrastructure, Technologies, and Tools) across the individual EM pillars (Capability Groups: Prevent; Prepare; Respond; Recover).



Figure 11: Capability Elements: Prevent



Figure 12: Capability Elements: Prepare



Figure 13: Capability Elements: Respond



Figure 14: Capability Elements: Recover

While not particularly conclusive, overall these figures would seem to, once again, make an argument for balanced and targeted investment across the four EM pillars. The appearance of the Red (critical) ratings in Prevent in the capability elements of organization and people and policies, processes, and procedures sets a starting point for targeting there. It is to be noted that there are several other unresolved ratings throughout the capability groups that may result in more critical (Red) ratings.

A tabulation of the totals for each capability element across all four pillars (capability groups) results in *Figure 15* (below).



Figure 15: Capability Elements: Totals across the EM Pillars

This final figure with the totals of the rating for each capability element across the four EM pillars hints at an overall investment conclusion: Infrastructure, Technology, and Tools is not where the immediate challenge lies. Rather, targeting should sway towards the capability elements of People and Organization and Policies, Processes, and Procedures.

4.5 Criticality

Figure 16 (below) depicts criticality assessments across the capability groups. Again, there are a small number of unresolved assessments (i.e. Grey). A small number of tasks were gauged to be of medium importance; none were judged to be of low importance. The overwhelming majority of tasks were considered to be of high importance, including all but two of 36 Respond tasks. No consensus was reached on those two tasks. (This may reflect in part the participant set.). Despite some challenges in other areas, Figure 16 provides an indication that the Respond pillar is an essential linchpin of the HP community to address the specific demands of an unfolding public health crisis. If a conclusion is to be drawn from this figure, it might be that in order to reap the full benefits offered by a HP community response to a pandemic emergency, a modest investment in common/enabling capabilities will be required. Such an investment must not come at the expense of the response pillar; rather, it must enhance and augment the ability of the HP community to provide a cross-government, holistic, and comprehensive response to a pandemic.

The bulk of the TTX concentrated on identifying HP community capabilities, shortfalls, and gaps. There are other players and international organizations that have an impact on Canada's ability to respond to a pandemic event which were not entirely addressed through the TTX, including the role of Public Safety Canada, the WHO, surveillance systems, and international scientific networks, which are essential for managing a threat of this magnitude. A robust capability assessment also requires time and resources to effectively capture this input and assess interdependencies with respect to public health officials, first responders and provincial public health care systems (including impacts on first receivers).



Figure 16: Criticality Findings

4.6 Participant's Survey

Workshop participants were invited to complete a brief one-page feedback survey. A copy of the survey can be found at Annex C. The results are shown below (Figure 17).



Figure 17: Participants' Survey

For the most part the participants found the TTX topics relevant to their areas of responsibility. This should not have been a surprise given the PHERA's role in supporting and directing preparations for the TTX. One of the survey respondents who assigned a mid-table ranking suggested greater use made of more recent and relevant references.

The response to whether the methodology was well-explained and whether the scenario provided sufficient context generated a wider set of replies. Methodological challenges and refinements were discussed at the close of the TTX and these observations are reported separately. However, some of the specific survey comments are noteworthy. The first pertains to the diversity within the HP and the fairly narrow focus of the TTX; that is, the recommendation to tailor future exercises to cater to the roles and responsibilities of all of the contributors. The second pertains to the need for a "more comprehensive scenario and consequently more inclusive list of HP tasks." Experience to date suggests that developing a common framework for enterprise/community use is feasible, and it was always the intent that the community should eventually "own" the task inventory.

Most participants felt that the facilitators provided "clear, relevant, and comprehensive guidance," a tribute in no small part to counsel provided following the earlier PHERA presentations and the dry run. As evident from the bar graph (Figure 17), the vast majority of participants found the length and agenda to be very appropriate. The outlier also rated methodology/scenario and facilitation as 2/5 and was the sole exception indicating he/she had no interest in receiving this report and/or participating in similar events.

5 **Observations**

5.1 TTX Administration/Conduct

Although the participant's survey indicated a generally high level of satisfaction with administration arrangements and conduct of the exercise, through a discussion with the HP community during the hot wash-up session after the TTX, a number of areas for improvements were identified:

- It was not clear until the week of the TTX that there might be a few PHERA members participating via teleconference. Although the preparatory material was distributed well in advance, dispersed participants from off-site locations would have found it challenging to follow the presentations and discussion. Furthermore, no formal arrangements were put into place to collect completed questionnaires of dispersed off-site participants on completion -- an obvious oversight. In spite of this, the regions and FNIHB still completed the capability assessment and sent their completed worksheets in electronically after the TTX. In hindsight, video conferencing offers a distinct advantage over teleconferencing; as does moving to a web-based decision support system. The choice was made in this case for teleconferencing.
- Costs precluded reproducing the MEL and Prevent, Prepare, Respond and Recover capability framework tables as wall posters. One wall poster (Recover capability framework worksheet) was procured and displayed. If time and budget had permitted, it would likely have been useful to have prepared a suite of posters to help establish the context and underscore the focus of the effort. However, the organizers of the TTX provided all documentation and material to participants in advance, including the preparation of comprehensive briefing binders for each participant as take-away product.
- In addition, it was suggested that it would have been desirable to have ready references (perhaps cross-references, such as lessons learned documents from the H7N9 experience) to WHO and Canadian pandemic phases available.¹²
- The introduction of an elaborate Excel-based, capability assessment template may have proven somewhat overwhelming to those participants who had not had time to consider the methodology and review the form prior to the TTX. In reviewing the methodology, it was suggested that the process might be broken into two phases: 1) an initial workshop in which all SME participants would team to construct relevant task inventories; and 2) an evaluation TTX conducted similar to Exercise Perseverance. There are two issues to consider: SME availability is a significant factor and will be a continuing constraint. In hindsight, a 'practice run,' conducted separately or in conjunction with the dry run might have been useful -- conducted the week before for those available conceptually, this practice run would use generic/non-HP tasks. The second issue relates to the requirement for an agreed-upon framework and task inventory, which would be authoritative enough to promote convergence and integration, and stable enough to facilitate tracking over

¹² Of note, modified (and simplified) WHO phases were renewed and approved the day before the TTX.

time. The collaborative creation of a framework and task inventory would eliminate the need for a series of workshops.

- Individual Excel worksheets (all on one large sheet of paper) worked well, reinforcing the TTX structure and facilitating data collection. However, participants (and, subsequently, analysts) found that the more complex worksheets (Prepare and Respond) were difficult to use (i.e. small print and fields). These worksheets could easily have been double-sided preserving the distinction of letters and simultaneously reducing eye strain. Again, a longer term solution may involve transition to web-based data capture.
- It was suggested to take full advantage of SMEs. Given the desire to assess all EM pillars/HP tasks, future workshops should consider break-out sessions. It was not clear whether these workshops would be based on EM pillars or HP organizational mandates (e.g. First Nations). As raised during the ensuing discussion, there are pros and cons to this suggestion. While break-out sessions might provide an opportunity for specialists to conduct a more in depth assessment, many participants felt that they benefited from the broader group discussion. A compromise might be to schedule a general session affording break-out groups the opportunity to report back while exposing the broader audience to (and giving them the chance to challenge) the assessment and rationale.
- It was observed that the provision of an example might have proven to be extremely useful. A sample of a completed worksheet/scorecard, and possibly an illustrative report to higher management (e.g., how to present capability gaps; how to prioritize treatment options) would assist participants in appreciating more fully what is being asked of them. Time precluded preparing one for Exercise Perseverance and there is always some danger in prejudicing results. However, this idea has merit and the use of examples from other EM communities might be useful in both framing capability assessment expectations and in promoting an exchange of best practices. In the lead up to the TTX, fictitious examples of capability assessment scorecards were produced and shown to participants as part of demonstrating the capabilities and functionalities of the Full Spectrum Scenario Management System (FSSMS).
- It was suggested and widely supported that the emergency management pillar of 'Prevent should in fact be 'prevention and mitigation' this was due to the fact that a pandemic is deemed to be impossible to prevent; therefore, mitigation is the appropriate title for this type of threat.
- It was observed that the Criticality column should have its title changed perhaps 'Importance to Task.' As well, criticality (or its replacement title) should have a 'language ladder' and legend to describe and define 'High/Medium/Low' ratings. A language ladder for this criterion was discussed internally by the project team and prepared in advance of the TTX, but was not incorporated into the slide package for participants, an obvious oversight. It was also considered to conduct the criticality assessments first, before the capability level assessments to ensure a balanced perspective for each part of the TTX.
- It was suggested that sectorial tasks will have to be introduced more aggressively as this project progresses so external links can be visible where they affect task and capability in PHAC.

- It was observed that more data should be extracted from existing plans. The examples used were good more and more recent would be better. Augmented SME participation in suggesting and obtaining existing plans will assist in future efforts.
- More participants and broader representation would be positive for the TTX experience. Particularly, the inclusion of Communications divisions would be seen to be a necessity for pandemic assessments. Participation from members of the communications divisions would have helped confirm leadership roles during a public health response to an event that has significant implications for emergency management response. Depending on the specific phase or EM pillar (Prepare, Prevent, Respond, etc.) the lead might change over the course of an event and necessitate inter-departmental coordination.

5.2 Methodology

The TTX provided the opportunity to trial the capability assessment methodology. Before adjourning, a short period of time was apportioned to a dedicated discussion of the methodology. Challenges were noted and some refinements suggested. Some of these suggestions warrant consideration.

5.2.1 Capability Assessment Model

There was no challenge to the capability assessment workflow diagram (Figure 1). Participants seemed to place capability assessment and appreciate 'how the pieces fit together.' Nevertheless, the identification of the capability shortfalls and gaps also implies risk.

5.2.2 Capability Framework

Using the EM pillars to group capabilities proved a sound decision, coupling the framework to existing policy and legislation (e.g. the *Emergency Management Act*) and, with the introduction of a common/enabling group providing linkage to the TCL-C. The introduction of a governance group was not commented on, and analysis of the worksheets suggests it did not present any problem in application. One participant proposed that pre-event, during the event; and post-event be substituted. This suggestion did not garner much support and risks both losing the connection to GC policy and introducing another concept. Furthermore, as discussed earlier, it may prove difficult to establish with precision and applicable to all participants 'event' start.

It was observed that it is impossible to prevent many non-malicious threats and recommended that 'prevent' be retitled 'Prevent and Mitigate'. This change is supported -- it would be both more accurate and provide stronger linkage to the EMA and TCL-C.

Although not highlighted, it was interesting to note the EM pillars equate roughly to the new WHO phases: Inter-pandemic, Alert, Pandemic and Transition.

As Figure 2 attempts to depict, the capability groups (based on the EM pillars) may overlap, not only because more than one 'incident' is in play. One observer suggested that, consequently,

Respond and Recover might be covered jointly to streamline the assessment. To do so would be to risk focusing attention on Recover (the poor cousin), and is not recommended.

5.2.3 Mission, Function, Task

The Mission/Function/Task decomposition model was well accepted, if not familiar to many, and prompted little discussion. The people and organization; policies, processes and practices; and infrastructure, technology and tools construct appeared to work well. It allowed for some discrimination in capability assessment and gap attribution.

During the post-Exercise Perseverance discussions, one observer suggested an alternative to the Mission/Function/Task decomposition model. The observation cited a recent RAND study based its capability stocktaking on Defence Lines of Development.¹³ However, the problem is not a lack of models to choose from, but rather the existence of competing capability component decomposition models. The challenge lies in retaining simplicity and ensuring usability. Introducing additional dimensions and asking SME to apply them in evaluate extensive task inventories, amounts to a significant increase in work load. Also, given the diversity in EM stakeholders and remembering that the object of the exercise is to inform investment planning, there is an argument to be made to keep for keeping a straightforward construct which relates to personnel, operations and maintenance, and materiel procurement budgets.

While the scoring of capability elements was found to be simple and reasonable, it was observed that a more robust system of performance measurement would assist in understanding capability levels across the spectrum. At a minimum, the word ladders should be reviewed and refined.

5.2.4 Task Library

The task library was developed using Excel following a review of After Action Reports and the TCL-C, and then was refined prior to the TTX. That is, a number of rows describing tasks which were deemed outside HP's mandate were hidden. This proved a convenient means to maintain an extensive library while allowing for the selection of tasks tailored for a subset of the community or a specific exercise.

As noted, during the exercise, a number of minor amendments to the task library were suggested. The HP Exercise Program Division indicated they also had a task list. It is recommended that these be reconciled, the Exercise Division assume ownership, and, as a next step, performance measures (e.g. capability goals) be developed and published as part of the effort to refresh the TCL-C.

5.2.5 Capability Inventory

Known people and organization; policies, processes and practices, and infrastructure, technology and tool elements were listed on the master Excel spreadsheet. It provided a means to characterize and structure information.

¹³ Neil Robinson, Agnieszka Walczak, Sophie-Charlotte Brun, Alain Esterle and Pablo Rodriguez. Stocktaking study of military cyber defence capabilities in the European Union, 2013.

This 'capability inventory' was included on the TTX worksheets to assist SME in defining and understanding tasks. Participants were invited to complement this initial capability inventory. Only a small number of observations were received. The TTX focus was on assessment and time likely constrained input. In sum, it is not clear how useful this attempt at generating a 'capability inventory' was. Further study is needed to determine whether or not it is worthwhile pursuing. The suggestion of holding a workshop for this activity prior to the TTX has some merit.

5.2.6 Seeding the Assessment

Extracts from publicly available reports on previous pandemic events were reviewed and an attempt made to relate these to HP tasks, using the master Excel spreadsheet. The intent, in part, was to illustrate the potential value of using a common planning framework, ideally based on capabilities, to support the lesson learned process. The reports were arranged in reverse chronological order from left to right in an effort to allow participants to note remedial progress and support a current assessment. Again, it is not clear if reference was made to the comments in conducting assessments and how useful, if at all, the seeding was.

However, in reviewing the methodology at the end of the TTX, there were two proposals, indicating that some found the seeding data useful. First, it was observed that more and more current data was available. It was only time and access that restricted pre-TTX population of the seeding and, if warranted, more data could be added. Secondly, it was suggested that executive summaries of the major reports/references be provided. This recommendation is supported; an executive summary would help situate the comments. It was observed that more data should be extracted from existing plans. The examples used were good – more recent examples would be better.

5.2.7 Assessment

Much of the immediate 'hot wash' discussion focused on the assessment approach, and a number of suggestions were proposed that merit consideration. These included:

- An explicit 'not applicable' option. TTX participants were invited only to assess tasks for which they felt they had SME to contribute. During the hot wash/AAR, it was suggested that, in addition to Green/Yellow/ Red options, a N/A (not applicable) option be listed on the data collection template. This would highlight areas in which the participant set lacked knowledge. However, to introduce another category would further complicate the template and collation. In lieu it is recommended that the rule set be emphasized prior to 'voting.'
- Defining criticality. It was decided to try to capture a sense of task criticality to complement participant's aggregate assessment of capability. This presented somewhat of a challenge as serious and critical were used in the language ladders to describe capability element shortfalls. What was not covered in assessing capability elements was a sense of how often a capability is invoked, how frequently the HP task must be performed. It seems fair to assume that an assessment of capability/task importance and frequency can be extrapolated by SME from an illustrative scenario. In the event, the TTX experience and participants' comments affirmed the feasibility and value of trying to assess cumulative consequence. It is recommended that task importance and frequency

be substituted for criticality to avoid any overlap or confusion with capability element assessments, and that an appropriate word ladder be developed.

• Substituting a Likert scale for the stoplight system. Some participants felt that the green/yellow/red scale was constraining and expressed a preference for ordinal vice categorical values and use of a one to five scale. This could be readily incorporated and would allow for greater discrimination in rating and, subsequently, greater differentiation following analysis. As always, it has to be borne in mind that the assessment is based on a subjective judgement. Further, a stoplight system may be sufficient for decision makers bearing in mind that the objective is to inform investment plans - plural. Would the introduction of additional colours (e.g. orange or turquoise) contribute significantly? Having said that, by using a Likert scale, a matrix could be constructed to 'translate' overall assessment and importance scores to a Green/Yellow/Red grade (Figure 18). Obviously, and not shown, a one-to-five scale could also be used to rate importance.



Figure 18: Gap Analysis Matrix

• Weighing capability element and tasks. During the hot wash, it was also suggested that a system of weighing the capability elements be introduced to assist with determining the relative importance of findings. The mixture (capability level and relative importance of the capability elements) varies per task and the importance of tasks may vary with each scenario. The latter was and will be captured. It is not clear the relative importance of elements would contribute much to a capability assessment and may belong more appropriate to analyses of capability generation (solution) options. Not least, there is an inherent danger in trying to extrapolate too widely from a single scenario.

• As noted, in collating responses, there were some tasks in which an overall assessment could not be determined given the divergence of opinion. They were left unresolved. It is unclear whether it was interpretation of the task or unique knowledge sets which contributed. It underscores the shortfalls of a one pass system and the merits of a Delphi approach which feeds back the results (non-attributable) for further discussion. It was agreed that draft assessment would be prepared and distributed to participants for review and comment as a prelude to a presentation to ADM-EMC in the fall. This may afford an opportunity to reconcile assessments.

5.3 Scenario

The scenario was not discussed at length during the TTX; as planned, it provided the backdrop for invoking and assessing capabilities. During the hot wash, it was suggested that consideration should be given to an instance in which it proved impossible to create and produce a vaccine. Although not discussed further during the hot wash, this warrants discussion. Yet, the value in examining worst case/catastrophic scenarios may be limited. It is often unclear how plausible doomsday scenarios are and they tend to devalue the merits advance planning and rehearsed reaction offer. In general, it is preferable to concentrate on 'probable' threats/hazards and craft scenarios which are both credible and challenging. The AHRA process has employed the concept of a 'nominal scenario' that is considered a median point from which elevated consequence or likelihood scenarios may be developed to test EM planning, capabilities and capacity to respond. This raises the issue of scenario selection.

A pandemic scenario was chosen for the proof-of-concept TTX for two reasons. After considering probability and impact, the AHRA process identified a pandemic as a high profile risk. Second, the PHERA volunteered to participate in a capability assessment proof-of-concept exercise and had a communal interest in pandemics and the capabilities required to successfully mitigate this form of incident.

Prior research investigated development of a scenario framework for characterizing scenarios to support DRDC's Public Security Technical Program (PSTP).¹⁴ A number of properties were identified which could be used to describe and classify scenarios. These dimensions included stimulus or trigger, timeframe, capability group, and science community, and are depicted below (Figure 19).

¹⁴ Doug Hales, Peter Race. Public Safety Technical Program Planning Scenario: Final Report, DRDC CSS CR 2010-10, December 2010.



Figure 19: PSTP Scenario Framework & Dimensions¹⁵

Each dimension provides unique perspective; however, all may not deserve equal weight when it comes to nominating a scenario for capability assessment. A follow-on project for the DND suggested that there are three distinct tiers of dimensions.¹⁶ As the name indicates, drivers represent core imperatives. Conversely, descriptors are used to enable characterization of important facets and derivatives to capture variations in tertiary factors intended to allow exploration of sensitivity to lesser changes. For example, relating to scenarios to S&T clusters/EM Communities of Practice (CoP) is a useful descriptor but should not be used to determine nomination for full spectrum development. Variations in geographic settings support comparative analysis but serve as derivatives and, likewise, should not determine selection for capability assessment.

It is recommended that the scenario dimensions be reviewed, as a prelude to development of an automated FSSMS. Specifically:

- It should be recognized that there is one prime driver risk. This is a function of stimulus/trigger and impact/consequence and likelihood/frequency of distribution. It is logical that the risk profiles determined through the AHRA should serve as the overriding factor in selecting scenarios for capability assessment.
- S&T Cluster/EM CoP should be the next factor (driver) to consider recognizing that capability needs are unique and capacity (and opportunity) issues must be considered. The S&T Clusters/EM CoPs framework should be refreshed to reflect CSS harmonization and structure. An alternative would be to use the Emergency Support Functions (ESFs) as a driver.

¹⁵ Douglas Hales, Peter Race. *Applying a framework for defining emergency management scenarios*, Journal of Emergency Management, Volume 9. Number 1, January/February 2911, pg 16.

¹⁶ N. Chuka, L. Cochran, S. Friesen, D. Hales, LCdr. Harnett, C. Morrisey, and P. Race. Development of the Force Planning Scenario Framework: Inputs for the Scenario Analysis Tool, DRDC CORA CR-2010-017, 1 February 2010.

• EM pillars/capability groups and focus serve as valuable descriptors. Ideally, an agreed capability framework would serve the former. The -3 to +3 scenario time horizon could be integrated into an EM pillar/capability group dimension.

5.3.1 Triggers

Pandemic related incidents were identified and an event library generated as a prelude to scenario generation. A number of events were descriptive in nature and employed to establish context, and others describe responses to events. An attempt was made during the TTX to distinguish triggering events, events which serve as key indicators and catalytic stimuli prompting reaction. Although isolating triggers - establishing causal relationships and determining which event in a series served as the 'tipping point' - can be difficult, Exercise Perseverance participants identified some clear triggers.

These included during the (run up to the pandemic) Prepare pillar:

- Identification of a new strain/novel virus;
- Interspecies transmission of the virus, i.e. from fowls and/or animals to humans;
- Human to human transmission of the disease;
- Severity of the disease in its initial phases; and
- Geographic spread; in particular, arrival in North America.

Each of these events serves as both a key indicator and stimulus triggering reaction. It was noted that time of year, infectivity, severity, lethality, (e.g. hospitalization and mortality rates) are also important factors.

Isolating triggers events relating to Respond activities was more difficult; events are compressed and the couplings tighter. It was suggested that the first death in Canada would prompt a reaction and could be viewed as a trigger, although it was not clear what additional responses would be prompted. It was opined that severity would likely prove even more of a critical factor. Participants did agree that in some cases decisions could serve as triggers, an example being the decision to declare a national health emergency, a step never yet taken. Conversely the decision to reorient vaccine production to counter the pandemic virus rather than the annual flu bug was seen as significant but not a trigger. Finally it was recognized that public anxiety and specific events could well serve as triggers, the H1N1 related death of an 8-year old boy being an example, and that in many ways urban and rural outbreaks pose distinct problem sets. Although not explicitly raised at the TTX, a pandemic outbreak at a First Nations reserve, Inuit community or Federal prison would likely serve as triggers.

By definition transition from Respond to Recover is more controllable. The lone trigger noted was related to HR refreshment and the need to address burn out and manage de-escalation, demobilization and restoration.

5.4 Health Portfolio (HP)

Specific comments on Prevent, Prepare, Respond and Recover capabilities are included in Section 4: Findings. A few more general remarks may be in order.

The TTX provided an opportunity for the HP community to meet and compare notes. The HP Community is composed of PHAC, and the separate agencies of Health Canada (HPFB, FNIHB, and others) which each have their own mandate. Feedback suggests such meetings are welcome. In this case, advantage was taken to align the dates for the TTX with existing meetings (i.e., benefit from participants who were already visiting and in town for other meetings). During the hot wash, mention was made of the potential to use a decision-support system to be capture and collate data on the spot. This would enable the exploration and facilitation of all tasks and capability elements, and provide for a second pass and opportunity for immediate dialogue and a focus around areas of divergence. Distributed voting was touched upon but not supported for this first iteration – the participants favoured face-to-face discussion. It was suggested that to work individually would be a sub-optimal approach which would lack the education, information-sharing, and team-building aspects of the group approach. However, electronic voting and the use of decision support systems will be investigated as part of the risk analysis tools and capability assessment automation work in CSS.

This type of activity, due to its subjective nature, is very much dependent on the SME participants' full engagement. The lists, tables, and resulting findings are a reflection of the knowledge and experiences of those who participated in the exercise. Broader representation is required to ensure all stakeholder perspectives are considered. The proof-of-concept may have reflected more of a coalition of the willing than an ideal representation of the HP. In particular, the Communications Division was not represented and FNIHB representatives were only able to attend the morning session. The requirement to ensure the findings are valid may have to be balanced with more directed participation.

Of special note, the FNIHB contribution (provided after the TTX) proved that their mandate and world view were markedly different from the rest of the HP community (there may be other agencies with the same experience). From the results of the capability assessment, the FNIHB ratings displayed a perception that all four pillars had many serious gaps in capability which need to be rectified. Clearly, some attention to this governance area seems warranted.

In general, the findings suggest that there is a fairly strong consensual view about current capabilities and where gaps lie. The number of capabilities assessed to be satisfactory (i.e. Green) is both encouraging and noteworthy. It also suggests that that there was no effort to 'game' the assessment. It is interesting to note these include capabilities in Prevent and Recover capability groups, reinforcing the advantages of full spectrum analysis.

Observations and analysis indicate that the Health Canada organizations have mandates that are different from that of PHAC, and that the mandate and set of capability requirements of FNIHB (and presumably others charged with responsibilities for Federal populations) differ from 'core' PHAC capabilities. PHAC focuses on the administration and distribution of vaccines; whereas, FNIHB addresses FNI issues in the context of a pandemic; and the Biologics and Genetic Therapies Directorate of HPFB regulates (reviews and approves) submission of vaccines and other health products/drugs related to a pandemic. This raises the question of whether and when

it is worth considering capability subsets. An effort was made to focus the scenario and discussion on these 'core' functions.' Events related to First Nations and Inuit populations and events invoking requirements to liaise with other government departments (OGDs) (e.g., DFAIT and CBSA) were not played. Capabilities required for the HP to discharge a primary department role were not explored. During the hot wash, it was noted that at some point capabilities (competencies and capacities) associated with partnering need to be examined. It is clear that with more education and testing, that more complex TTXs with capability frameworks that include a prime partner and horizontal supporting partners can be designed. The time required to coordinate such TTXs and the time spent to understand each other's differences between sectors and institutions will increase to achieve a solid final product.

6 Way Ahead

6.1 Methodology

The proof-of-concept capability assessment confirmed the requirement, and appetite, for a formal process to link risk assessment to strategic priorities and investment planning. In the case of national level risks, investment priorities and planning, public and private, authorities are fragmented and programs and decision cycles are rarely fully aligned. A common planning framework offers the opportunity to promote integration and a common process the opportunity to develop best practices.

The capability assessment methodology proposed was based on experience to date. It was generally well accepted by the HP community, notably core concepts such linking capabilities to the EM pillars, adoption of mission/function/task analysis and communal 'ownership' of task inventories. A number of refinements to the scoring schema were suggested and should be trialed.

Sufficient promise was exposed to warrant continued development of the methodology. Specifically this might include:

- Exposure to another EM community and different set of tasks and SMEs;
- Developing a full spectrum scenario based on a malicious threat/hazard; and
- Extending capability assessment to a functional or live exercise.

In order to maintain communal task inventories and ease data collection and collation, automation options are being reviewed and should be pursued. This would permit maintenance and sharing of event, scenario and task libraries.

The use of decision support technology should also be considered. This would permit initial SME assessments to be collated and compared rapidly, and the result to be reviewed and discussed collectively at one workshop. It also facilitates capture of individual comments and documentation of the proceedings.

Alternatively, there may also be some merit in pre-workshop distributed 'voting.' It would allow a broad range of geographically dispersed SME to participate in the assessment process. In Delphi fashion this could serve as prelude to a more detailed examination and refinement of preliminary results, possibly by a smaller group of SME.

6.2 Health Portfolio (HP)

The initial findings provide both a departure point and some insights into existing capabilities. The methodology did force communal consideration of the Prevent and Recover pillars, and to a lesser degree governance activities. It is noteworthy that a number of significant gaps were identified (e.g. Critical (Red) - recruiting specialists; and Serious (Yellow) - directing R&D and managing demobilization and compensation activities after a pandemic).

The results indicate that most of the HP tasks utilized in the TTX worksheets were deemed to be highly critical; this is no surprise as the capabilities and tasks were originally selected from the most critical in the various task lists. The Respond capability group was seen by the HP community to have by far the most critical tasks – clearly, the Respond capabilities figure as the most important across the spectrum for pandemic scenarios. The fact that there are a relatively large number of serious gaps in the Respond capability group would seem to indicate that balanced investment in Respond capabilities is an important way forward. Prevent capabilities, most of which are seen as highly critical as well, has the single critical (Red) rating and a relatively large number of serious gaps. Therefore, the Prevent capability group would also be a priority destination for balanced investment in the HP for pandemic capabilities along with Respond. It is possible that the Prevent capability group has the most potential for effect across all capability groups.

The Prepare capability group is quite balanced and seems to have been positively influenced by the recent pandemic experiences over the last several years. The fact that the Recover capability group has a majority of medium criticality ratings and a large number of unresolved criticality ratings is likely an indicator that more thought and planning must be put forward in this area.

From the perspective of capability elements, the analysis led the project team to the following conclusion: the Infrastructure, Technology, and Tools capability element is not where the immediate challenge lies. Rather, targeting of investment should sway towards the capability elements of People and Organization and Policies, Processes, and Procedures as a priority.

The overall results indicate that a strategy of balanced and targeted investment is best for capability improvement in the HP pandemic area. The investment that has the most effect across all pillars may be the wisest way to invest. Furthermore, decision-makers will likely take into consideration what investments can be absorbed by the communities in questions. The three areas that the TTX highlighted for consideration for balanced and targeted investment are: 1) response; 2) Prevent; and 3) FNIHB.

The way ahead from this initiative includes:

- Review, validation and presentation of the findings. There are a number of assessments areas in which the response range precluded reconciliation. The preliminary assessment should be endorsed by the PHERA. It is understood that there may be an opportunity to brief ADM EMC on the methodology and results in the fall;
- A review and validation of the task inventory. It was mentioned at the TTX that HP's Exercise Division has a task list; it is suggested the two be merged. It also became clear during the TTX that the capabilities invoked by a pandemic relating to First Nations and Federal populations are both different and more akin to those provincial, territorial and municipal authorities face. Consideration should be given to creating a comprehensive task inventory; and
- At the TTX it was noted that there are more recent references which might have been used to seed the assessment. It may be worthwhile reviewing these and characterizing the comments in order to generate a more complete record of after action observations and

lessons and facilitate monitoring progress – using a capability framework and task inventory.

6.3 Final Thoughts

Exercise Perseverance had a fairly narrow focus. For the most part, the capabilities examined were restricted to PHAC's, HPFB's, FNIHB's core mandates. It did not explore in any detail the HP's ability to function as a Primary Department and assist in directing a Whole-of-Government response. Perhaps more importantly, it is recognized that many of the substantive gaps likely lie in the seams, between public and private levels of government and the various sectors. If it is to realize its full potential in supporting the AHRA framework as a next level of analysis, capability assessment must, at some point, venture into the inter-government/interdisciplinary realms. It is recommended that methodological development and 'trials' continue bearing this in mind.

Annex A Exercise Perseverance Agenda and HP Participants List

Time	Activity
0830-0850	Welcome (Mark Williamson)
0850-0900	Introduction to CSS
0900-0910	Introduction to participants – teleconference administration
0910-0930	Introduction to Capability Assessment Methodology
0930- 0940	Introduction to the TTX
0940-0950	Part One: Setting – Initial injects (Prepare)
0950-1030	Interactive – Capability Needs Identification and Assessment
1030-1045	Health Break
1045-1100	Part Two: Update context – 2 nd Set of Injects (Respond)
1100-1145	Interactive – Capability Needs Identification and Assessment
1145-1230	Lunch Break – See Annex C for Map of Downtown Eateries
1230-1240	Part Three: Update context – 3 rd Set of Injects (Recover)
1240-1315	Interactive – Capability Needs Identification and Assessment (3 rd Set)
1315-1330	Introduction to Back Casting (Prevent)
1330-1415	Interactive – Capability Needs Identification and Assessment
1415-1430	Health Break
1430-1450	Review scorecard
1450-1510	Feedback on Methodology (hot wash)
1510-1525	Complete Participant Surveys
1525-1530	Concluding Remarks (round table & next steps)

Participants List:

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CAPABILITY ASSESSMENT USERS' GUIDE

7th June 2013

Introduction

Background

The User's Guide provides users with information and advice on how to adopt a functional (capability based) approach to needs analysis and investment planning. It provides brief descriptions of related processes, tools, and products, but the focus (reflecting ADM EMC direction) is on developing a practical "how-to" guide for applying simple tools and techniques and conducting structured capability assessment.

Overview

Capability assessment provides an essential link between risk assessment and investment planning. To help situate capability assessment, it's supporting processes and tools are illustrated below (Figure 1). Full spectrum scenarios provide a contextual backdrop for facilitating the articulation of required tasks and capabilities. A Capability Framework (based on the Target Capability List – Canada (TCL-C)) provides a common language and taxonomy, serving as a tool for enabling operational planning and analysis and for use in promoting communication and interoperability. It also enables planners to decompose the problem space by breaking down elements into component parts, facilitating integration and knowledge synthesis. The resulting appreciation of priority gaps and functional parameters will enhance investment planning. Each of these constituent building blocks is described below (pages 5, 6) in a little more detail.



Figure 20: Capability Assessment Model

Processes

All Hazards Risk Assessment

An All Hazards Risk Assessment (AHRA) has been adopted by the Federal Government to establish common principles, processes and criteria for identifying and evaluating risks.¹⁷ As illustrated (Figure 2), the process consists of a sequence of activities focusing on near term (1-5 years) malicious and non-malicious threats and hazards. The sequence includes:

- Setting the Context articulating objectives and defining factors to be considered;
- Identifying Risks recognizing, and recording hazards and threats;
- Analyzing Risks examining the nature and level of risk, i.e. likelihood and consequences;
- Evaluating Risks comparing the results using common criteria to determine whether a risk is acceptable or intolerable; and,
- Treating Risks identifying and recommending risk control or mitigation options.

The output of the AHRA process is shared appreciation of environment and actors and a high-level, enterprise-wide risk profile. Threats and hazards are ordered and those warranting more detailed analysis are determined. Supplemental remedial planning can then begin.



Figure 21: All Hazard Risk Assessment

¹⁷ Emergency Management Planning Public Safety Canada, All Hazards Risk Assessment Methodology Guidelines 2012-2013, <u>http://www.publicsafety.gc.ca/prg/em/emp/2013-ahra/_fl/2013-ahra-eng.pdf</u>
Capability Based Planning

Capability Based Planning (CBP) has been introduced in many departments and agencies in Canada and abroad. CBP can be used to extend and complement the AHRA by helping to manage risk and address the challenges and uncertainties associated with continuous and accelerating change. It is based on several, simple, foundational principles. First and foremost, CBP is an assessment process intended to distinguish the capabilities required to effectively respond to an all-hazards risk scenario. It focuses on desired outcomes and employs a functional approach for describing concepts of operation, defining requirements, characterizing resources, and assessing gaps. Using a scenario-based approach, it allows emergency planners to conduct an analysis of required capabilities, compare those capabilities to existing capabilities to determine shortfalls and gaps, and identify options / solution strategies for remedial action and implementation. Focusing on functionality raises the level of abstraction and allows for separation between requirements and solutions; ends are identified but ways and means are not specified. This approach encourages innovation and facilitates integration. Subsequently, as requirements are defined in detail, concepts of operation and theoretical performance measures are translated into tangible assets and performance specifications: capabilities generated through combinations of people, processes and equipment. CBP has been described as a methodology for adding content and clarity to vision in order to arrive at actionable blueprints.

CBP is part art, part science. While there is no universally 'approved' CBP process, there is general agreement on an underlying objectives and processes. Figure 3 includes a number of steps that have been likened to judgment, research, and action and includes identification/formation of the problem, construction/evaluation of alternatives, and realization/implementation of the solution.



As depicted in both Figures 1 and 3, illustrative scenarios play an important role. They are used to establish context, determine requirements, evaluate preparedness and concepts of operations, validate emergency response plans, and expose functional requirements. The capability needs exposed can be defined in terms of desired performance criteria (e.g. quantity, quality, readiness/timeliness, coverage, etc.) and these employed, in turn, to support an audit of existing organizational or jurisdictional competencies and capacities and options analysis.

Capability Investment

An Emergency Management Framework for Canada recognizes that responsibilities for emergency management are shared between federal, provincial/territorial and municipal governments and partners. Consequently, investment plans reflect jurisdictional mandates and priorities, and autonomous decisions. Capability assessment aspires to identify functional requirements, determine capability shortfalls and gaps, and inform investment planning.

A generic capability investment cycle is pictured in Figure 4. Implicit is the recognition that underlying decision coherence is a shared appreciation of the safety and security environment with its existing and emergent threats and hazards. The AHRA provides a common framework for characterizing risks and considering consequences. Capability assessment (depicted in the yellow oval) extends the risk event scenario descriptions developed by departments and agencies to assess risks and uses these to support an analysis of capability requirements and audit of the current capability inventory.



Figure 23: Capability Investment Cycle

Since the context for responding to and recovering from a man-made or naturally occurring event cannot be predicted with accuracy and confidence, one of the objectives of capability assessment is to

support an appropriate order of magnitude analysis and to provide insight into demands; that is, into where and when capabilities are sufficient or inadequate at the jurisdiction, corporate/enterprise, or whole of government/whole of society levels. Given the inherent uncertainties in the public safety and security environment, general purpose approximates capable of adaptation and application to a broad spectrum of incidents are preferable to narrower, more rigid point solutions. Projects within business-line portfolios will define requirements in more detail and additional programmatic factors, such as scalability, cost, and sustainability A capability assessment will help validate and maintain emergency management plans, programs, projects and provide a clear context for decision making.

One of the benefits that a capability investment approach offers is the entrenchment of a broader, enterprise perspective. It provides a mechanism that allows organizations and jurisdictions to establish priorities, integrate multiple jurisdictional and organizational and cross-functional requirements, and ensure the relationships and systems (technology and tools) being integrated effectively support a full spectrum of emergency management, planning and response activities.

A linear process and sophisticated planning cycle is unsustainable; few departments or agencies have sufficient dedicated staff, time, or resources. Capability investment aims to develop collaborative practices and to produce provisional products that can be continuously reviewed and updated. For its part, a capability assessment process must be focused and relevant. A number of core principles can be discerned:

- **Simplicity**: A capability assessment should be straight forward and the logic model easily explained and readily understood. As noted, the objective is to generate a relatively simple policy-level model to provide insight -- not to produce a detailed system engineering model. Sufficient detail to be actionable is needed (e.g. to support options analysis and inform plans for generating and sustaining capability);
- **Transparency**: If it is to inform investment planning, the capability assessment process should be transparent and the conclusions and findings traceable;
- **Collaboration**: As discussed, many, if not most, of public safety/security challenges are complex and involve shared risk and accountability. Capability assessment must acknowledge cross disciplinary implications and cascading effects. Insofar as possible, participation should be inclusive in order to ensure the knowledge and perspectives that partners bring to the table is considered. Stakeholders are organizations/people that have a valid interest in an enterprise; and
- **Stability**: Stability is highly desirable to promote consistency and enable benchmarks to be established and progress over time to be tracked. The objective should be to improve rather than to reinvent the wheel. A champion is likely required to oversee periodic reviews, manage incremental improvements and "own" capability assessment writ large and its applications by communities.

Supporting Tools

Full Spectrum Scenarios

Scenarios, driven by threats and shaped by organizational plans, policies, procedures and objectives, are used to invoke capabilities and determine capability requirements. They are employed to describe and define the problem space, illustrate threats or hazards, and capture assumptions. They move CBP from concept to practice, providing the means to establish requirements, evaluate response options, define performance metrics and focus exercises and training.

Abbreviated risk event descriptions are developed as part of the AHRA process. Vignettes provide context for evaluating the likelihood and impact, and the priority of threats, and need to be extended to support a capability needs analysis and gap assessment. The term 'Full-Spectrum Scenario' is employed to underscore that emergency management (prevention and preparation) starts before an incident occurs and consequence management (response and recovery) extends beyond the immediate reaction to an incident. While the AHRA process and risk descriptors examine an incident at a point in time in depth, full spectrum scenarios provide a complementary, horizontal perspective and consider pre and post conditions and issues across the whole spectrum.

Full spectrum scenarios must have sufficient detail to highlight issues, promote awareness and make a diffuse threat or hazard understandable and real. However, in developing scenarios, it is important to keep in mind that they play a supporting role in capability assessment. Capabilities, and the resulting gaps and shortfalls, are the focus.

Capability Framework/Target Capability List-Canada

Characterizing capabilities can be challenging. Reaching agreement on a vocabulary is an essential precursor to communications and knowledge management, and to mutual understanding and interoperability. There is limited value in trying to establish measures and metrics for assessing specific capability requirements without a common terminology and an agreed framework for characterizing and categorizing requirement and for describing and ordering relationships. Such an approach has the added benefit of leveraging the input of key stakeholders representing multiple organizations and jurisdictions that have a national security, public safety and emergency management focus. A capability framework provides a common ordering scheme which will support both analysis and synthesis and facilitate comparisons.

The challenge is to describe the 'problem space' -- the public safety and security realm -- in terms of functions. An initial attempt to do so was undertaken by the US Department of Homeland Security (DHS) and the resultant Target Capability List adapted for trial usage by CSS.¹⁸ While it contains a great deal of useful information, the Target Capability List-Canada (TCL-C) suffers from trying to be all things

¹⁸ Centre for Security Science. Draft Target Capability List – Canada, Defence R&D Canada, January 2012.

to all communities. No distinction is drawn between strategic and tactical tasks and, as a result, it is voluminous and intimidating, and unsustainable.

The overarching or capability ordering schema is based on the Emergency Management (EM) pillars and the TCL and TCL-C. Collectively, capability groupings of Prevent, Prepare, Respond, Recover and Common/Enabling define the Public Safety and Public Security environment. Individually, each represents a core operational (or functional) competency as well as a distinct capability domain. A fifth capability group, Common/Enabling functions, includes such capabilities as risk assessment, planning, resource management, information and intelligence sharing, and communications. In this model, a sixth capability group, Governance, is added to reflect the oversight in managing various demands across domains, defining roles and responsibilities, allocating resources, and coordinating activities and administration. The capability framework proposed is depicted below (Figure 5). As shown, there may be some overlap between Prevent and Prepare and between Respond and Recover. Further, the divide between Prepare and Respond is to some degree in some cases self-referential. For example Canada may find itself preparing for a pandemic which is breaking out overseas.



Figure 24: Capability Framework

Four of the capability groups correspond to the EM pillars and associated activities described in *An Emergency Management Framework for Canada* and reflect the TCL-C organizational schema. These are:

- **Prevent** Prevention and mitigation activities required to eliminate or reduce the risks and impacts of disasters in order to protect lives, property, the environment and reduce economic disruption. These are pro-active measures taken before an emergency or disaster occurs, for example land-use management, public education and protective structures such as floodways and dykes. Prevention and mitigation may be considered independently or one may include the other;
- **Prepare** Preparedness and pre-planning activities required to be ready to respond to a disaster and manage its consequences through measures taken prior to an event, for example emergency response plans, mutual assistance agreements, resource inventories and training, equipment and exercise programs;
- **Respond** Response activities required to act during or immediately after a disaster to manage its consequences through, for example, emergency public communication, search and rescue, emergency medical assistance and evacuation to minimize suffering and losses associated with disasters; and
- **Recover** Recovery activities to repair or restore conditions to an acceptable level through measures taken after a disaster, for example return of evacuees, trauma counseling, reconstruction, economic impact studies and financial assistance. There is a strong relationship between long-term recovery and prevention and mitigation of future disasters.

The TCL-C recognized that there are also tasks which are common to Prevent. Prepare, Respond and Recover. The two overarching capability groups are:

- **Common/Enabling** Common/Enabling activities span the emergency management spectrum. They are integral to and provide horizontal linkage between Prevent, Prepare, Respond and Recover. Although the focus may differ somewhat – e.g. contingency versus incident action planning – these capabilities are general in nature and support and enable other capabilities; and
- **Governance** Governance activities establish enterprise goals and priorities, authorities and organizational structures, and monitoring and control processes.

Establishing a common framework is important. It provides an information management structure and represents an attempt to characterize and categorize the problem space and to describe and order relationships. In the longer term, it facilitates both horizontal and vertical integration by contributing to understanding between organizations and across disciplines; it provides linkage between policy formulation and interpretation and execution.

Capability Elements

There are a number of definitions of capability. Perhaps the simplest and most useful is to think of capability as the ability to accomplish a mission or function. Components or elements are combined to generate prerequisite abilities. Capabilities can be examined and constituent parts have been described

in a number of ways. In its simplest form three basic elements are distinguishable: organization and people; policies, processes and practices; and technology and tools (Figure 6).

- **People and Organization** the human resource component, proficiencies and sufficiencies e.g. manning levels and knowledge, skills and attribute sets. This includes education, qualifications, experience and training and organizational structure, descriptions of roles and responsibilities;
- **Policies, Processes, and Practices** the policies, procedures, and practices component e.g. activity criteria (thresholds and triggers) and sequencing, information flows, distribution of authority and decision structures, governance and tasking; and
- Infrastructure, Technology and Tools the tools and material component e.g. infrastructure (software applications, hardware systems, networks) and knowledge (data, information and intelligence).



Figure 25: Capability Elements

These elements (abbreviated as people, process and technology) can be used to describe resource combinations able to perform critical tasks to specified performance levels and achieve stipulated outputs.

Analysis

Decomposition/dissection is a tried and true analytical technique, employed to assist in framing the problem; appreciating the environment, factors and conditions; and understanding the roles, relationships and flows. An initial top-down overview permits efforts to be focused and detailed examination to be pursued once issues are identified. A mission/function/task approach is among the most common.

Mission, Function, Task

The mission/ function/ task construct is employed widely. Its objective is to articulate the problem, to enable information to be collected, organized and presented with a view to elevating the decision

maker's understanding of the problem beyond what was originally known or conceived. Well-structured mission/function/task decomposition enables capability requirements and system elements to be assessed. It offers an audible trail and provides supporting staff with an opportunity to assist in placing challenges in context and promote an understanding of objectives, needs, constraints, and issues.

As depicted below in Figure 7, a mission/function/task analysis involves a systematic analysis. It starts with a review of the mission, described in the full spectrum scenario, and a determination of mission objectives. Next functional requirements are identified; that is, the capability needs are distinguished. The analysis becomes less abstract and more grounded when these are translated into associated activities and assignments, tasks (specified and implicit actions) which are essential to realizing mission objectives and which can be assigned to organizations and people; supported by policies, processes and practices and applied using technology and tools.



Figure 26: Mission, Function, Task Analysis

As depicted, task level analysis would involve identifying supporting activities germane to both the scenario and the community, e.g. shown are those applicable to the Health Portfolio (HP) community. Creating a task library tailored to a community or enterprise will both facilitate analysis and disperse responsibility for promoting TCL-C employment and for sustaining TCL-C currency.

Taking the time to define the terms of a dialogue is generally worthwhile; it leads to less chance for misunderstanding and more time to focus on substantive issues. An attempt was made using Microsoft EXCEL[™] to develop an initial task library to seed the discussion at the proof of concept table top exercise. Separate sheets were used for Prevent, Prepare, Respond, and Recover. An extract is shown below (Table 1).

Capability Group	Capability	Health Portfolio Tasks
C		Establish mutual aid agreements
Governance	Manage relationships	Establish incident management management governance structure and decision processes
	Assess risk	
	Plan - develop and maintain operational,	Develop and maintain pandemic response contingency (interventions) and communication plans. Set immunization guidelines.
	contingency and business continuity plans	I dentify Critical business processes and publish SOPs
		Develop information and intelligence vertical and horizontal sharing protocols (i.e. within GC, with P/T/M, with private partners and with global community)
	Manage data, information and intelligence	Determine information requirements/reporting thresholds (Indicators & Warning levels)
Common		Establish SME communities and IT networks
		Determine training requirements
	Manage Human Resources	Train, qualify and position HP personnel
	Manage materiel and infrastrucure	I dentify and protect critical infrastructure, including supply chains. Prepare mass campaign infrastructure.
		Maintain stockpiles of vaccines and anti-virals
	Manage communications	Develop tailored/targeted public education & awareness program
		Establish readiness posture. Maintain capability inventory.
Dronara		Maintain immediate/emergency response teams
	Maintain incident/attack response capability	Develop and conduct training/exercise/rehearsal programs. Cross-train workers.
Prepare		Validate operational, contingency and business contingency plans
	Maintain Surveillance and Situational Awareness	Provide Early Warning - epidemiology surveillance, investigation, alerting and pre- position
	Audit prepardeness	I dentify/address preparedness shortfalls

Table 7: Prevent Related Capabilities and Associated Health Portfolio Tasks

Decision Support

Typically risk events deserving capability assessment are complex involving a number of stakeholders and warranting a coordinated response. Differing perspectives must be considered and fused. Hence, capability assessment should provide for structured elicitation of subject matter expertise (SME) to assist in sorting information, understanding causal relationships, and briefing findings rather than facts (i.e., it must combine empiricism and judgment). Pre-existing audits and requirements analyses, including lessons learned, should be used to inform the assessments and assumptions and constraints captured as part of the scenario generation process. The resultant consensus-based estimation provides an appropriate departure point for defining expectations and performance measures, and for informing investment priorities and plans. Outliers should provide pause for thought and may warrant further investigation; capability assessment should provide both challenge and validation opportunities.

Assessment Criteria

Common assessment criteria are needed to complement the capability framework and facilitate comparison and integration. The assessment framework is illustrated below (Table 2). As shown, it is suggested that shortfalls be attributed to one or more capability element. This additional level of analysis is significant and will provide the granularity required to shape investment decisions.

Status	Component
Adequate Capability	People & Organization
	Policies, Processes & Practices
	Infrastructure, Technology & Tools
Serious Shortfall	People & Organization
	Policies, Processes & Practices
	Technology& Tools
Critical Shortfall	People & Organization
	Policies, Processes & Practices
	Infrastructure, Technology & Tools

Table 8: Assessment Framework

Mission criticality will determine whether an existing capability is assessed to be sufficient or if it presents a serious or critical shortfall. The distinction between the two is a function of both the nature of the demand on the capability and the consequence of being unable to satisfy demand. For instance, if the mission would fail as a result of the shortfall (i.e., the capability will almost always be invoked and is key to mission success), it should be deemed critical. Similarly, if the mission would be jeopardized as a result of the shortfall (i.e. the capability is often invoked and will impede success), it should be deemed serious. In order to provide guidance to investment planners, shortfalls should be attributed to core capabilities along the preparedness cycle – people and organization; policies, processes and practices; technology and tools. In general, shortfalls can be attributed to insufficient proficiency or insufficient capacity. A qualitative word ladder has been developed to assist in assessment, an example of which is provided below (Table 3):

, ,	
Serious Shortfall – People &	An absence or insufficient pool of expertise and
Organization	experience required will jeopardize mission
	success. This could include inadequate or outdated
	training
Serious Shortfall - Policies, Processes &	An absence of established protocols or
Practices	unfamiliarity with processes and decision
	structures will jeopardize mission success
Serious Shortfall – Infrastructure,	The absence or inadequacies of supporting
Technology & Tools	technology and tools will jeopardize mission
	success
Critical Shortfall – People &	An absence or insufficient pool of expertise
Organization	required will likely result in mission failure
Critical Shortfall – Policies, Processes &	An absence of established protocols or
Practices	unfamiliarity with processes and decision
Practices	unfamiliarity with processes and decision structures will likely result in mission failure
Practices Critical Shortfall – Infrastructure,	unfamiliarity with processes and decision structures will likely result in mission failure The absence or inadequacy of supporting
Practices Critical Shortfall – Infrastructure, Technology & Tools	unfamiliarity with processes and decision structures will likely result in mission failure The absence or inadequacy of supporting technology and tools will likely result in mission

Table 9: Capability Assessment - Shortfall Descriptions

Conducting a Capability Assessment

Step-by-step guidance follows.

Step 1 Orientation

The goal of this initial phase is orientation and organization. To a large extent, this is an information collection and scoping exercise. The risk event description and related contingency plans and lessons learned should be reviewed, and key stakeholders and issues identified. Team-related roles and responsibilities should be agreed upon and a timeline and milestones established.

Step 2 Scenario Development

The purpose of the full spectrum scenarios is to capture assumptions and posit hypotheses. Scenarios are not intended to be prophetic, but must be relevant, plausible, and challenging. Moreover they must reflect a realistic time horizon (i.e., within five years). The full spectrum scenario provides context and a backdrop for identifying capability needs and evaluating current competencies and capacities.

Particularly in the field of emergency management organizations, drivers tend to be external events. A useful starting point has proven to be development of a Master Scenario Events List (MSEL). It can be used to establish sequential logic and inventory triggers. There are generally two classes of events. An incident timeline provides the anchor, relating incidents to consequences, actions, and reactions. While there are specialized software applications on the market, the MSEL can be generated manually by ordering, adding/deleting and reordering 'yellow stickies' or using standard office applications such as Microsoft PROJECT<u>m</u> or Microsoft EXCEL<u>m</u>. It may be helpful to employ 'swim lanes' to distinguish threat and response narratives, and/or to track the reaction of key organizational players. It is important to anticipate and note response/reaction measures as during step 4 it will likely be necessary to pause and re-establish a baseline to support discussion and assessment. The MSEL establishes a sequential ordering of likely events and interrelationships. The straw man MSEL that is generated should be tested. It should be reviewed by SMEs to confirm credibility and consistency, and by the Sponsor to confirm risk components and known issues and concerns are addressed. An example MSEL is shown below (Figure 8).

	PREVENT					PREPARE			
Numeric timeline	-4		-3			-2		-1	o
	Pre-Jan 14	Jan-14	Feb-14	Mar-14	Apr - 14	May-14	Jun-14	Jul-14	29 July, 2014
	TTX #4					TTX #1			
International Events	Governments at all levels improve governance, law, organization, and policy in order to be prepared for any future pandemic.	It is identi cause of mai of flu amony As of yet, no human-t transmissic obse	fied as the ny outbreaks ast chickens. evidence of o-human on has been rved.	Research c commences ai team is disp affecte Medical author that all huma history of e chicl	on the virus nd a WHO field atched to the ed area. orities identify in cases had a exposure to kens.	Two health care workers (caring for sporadic influenza cases) are reported to have developed influenza-like symptoms. By end-May, 120 human cases are reported, 33 cases were hospitalized; 12 died within a week.	Local hospitals and clinics in the region report (via national surveillance system) a large increase in febrile respiratory illness. The CDC completes an initial study, determines that gen are avian in origin, co that virus reflects n from previous inste	The virus appears to affect young adults the most. Manufacturer	s of
								antiviral drug	qs
Government of Canada Events	Governments at all levels review governance, law, organization, and policy order to be prepared for any future pandemic.	Questions at of Common whether ch the affecte exported	rise in House is regarding ickens from ed area are to Canada	WHO Memb informed via t human contac are being m illn	eer States are the I HR that all its of the cases ionitored for ess.	Information on human-to - human transmission is relayed via the IHR communication channels.	h	ave reported they are "so out."	that Id
Public Health Events				Virus sample requesting including t Microbiolog	es are sent to laboratories he National y Laboratory			d of anti-virals and of anti-virals and te commences. Mis acturers of antiviral drugs have reported that they are "sold out" in several regions in Canada.	
PH Events - Vaccine							The development of vaccine strains commences at the NML in Canada.		
Public Reaction						Media interest immediately increases and briefing pace increases.		Canadians are demanding information regarding what is being done to stop the spread of the virus and what measures are being used to protect Canadians.	



Next, the MSEL is transferred into a scenario narrative – a medium and language accessible and appreciated by the wider community. Telling the story gives life to concepts. Assumptions should be acknowledged, particularly any used to create boundaries for the scenario. Quantitative data may be included to provide a sense of scale and give an authoritative voice to the account of an incident. Descriptions of social impacts will be more qualitative.

The intent of a full spectrum scenario is span the time horizon and include all four capability groups (prevent, prepare, response and recover) and promote an inclusive consideration of requirements and tasks that must be performed to respond in the scenario. In practice the risk descriptors, which serve as the capability assessment stimulae, are grounded in the present and usually start with, at best, a brief description of the ' event triggers' and, more often, a description of the incident and immediate consequences. 'Back casting' (as opposed to forecasting) is an established methodology for exploring preventative and preparedness measures (i.e., identifying policies and programs which would have precluded the incident or mitigated the consequences).

The dangers of relying on a point scenario have been well documented. The objective of the capability assessment is not to support contingency planning per se; the aim of the exercise is to enhance decisions in a way that balances risk with requirement and need across an entire event continuum, not

better predictions. Hence, the full spectrum scenario must contain sufficient detail to support needs identification and capability assessment.

Step 3 Applying & Validating the Capability Framework

A framework has been developed to assist in articulating capability requirements and associating these with resource types and lessons learned. The framework decomposes Governance, Prevent, Prepare, Respond, Recover and Common/Enabling groups into distinct capabilities. This provides a start point for cataloguing capability needs. Organizational or jurisdictionally-specific interpretations and tasks can be associated with these capabilities. Over time, the application of the capability framework can be extended to include any missing tasks.

Use of a common capability framework supports analysis – i.e., detailed examination of the capability instantiation to support the scenario – and synthesis – i.e., the roll up of scenario analyses to provide a broader appreciation of capability requirements across the response continuum. If a supporting workshop is planned, it is recommended that the planning team review the framework with key stakeholders to ensure that terms used are ones that participants will be familiar with and comfortable interpreting. It may also help at this stage to start identifying the people and organization; policies, processes and practices, and technology and tools (e.g. systems) elements associated with each capability. An example is provided below (Table 4). This serves as the genesis of a capability inventory. As illustrated, it can also be extended and used to capture previously identified shortfalls.

		Capability Elements		
Health Portfolio Tasks	Organization & People	Policies, Processes & Practices	Technology & Tools	Notes
Conduct rapid assessment - identify, characterize and evaluate (specfic) risks	Situational Assessment Team (SAT)		Risk Perception Assessment Tool	Improving strategies for communicating risk and uncertainties and changes in status
Recommend cases and control management measures. Set immunization priorities. Consult, develop, and coordinate	PIC			
implementation of Incident Action Plans.		IAP Development Process		
Access/exploit specalist expertise				
Share information with peers and partners. Manage data				Information Management Protocol, Data management ability required
Manage health care facilities, cordinate usage, close affected hosiptals/wards				Hospital capacity and inventory of temporary facilities
Develop, test and authorize vaccine (medical countermeasures)	Pandemic Influenza Committee			Rapid clinic trial capability
Maintain epidemilogical surveillance. Monitor threat alerts & advisories (Warning & Indicators)	Centre for Infectious Disease Prevention & Control (CIDPC), NML Operations Centre	Incident/Event Reporting Process	International - Global Outbreak Alert & Response Network (GOARN), Global Public Health Intelligence Network (GPHIN); National: FLUWATCH (LLI Sentinnel Network); ACTive impact,	Response documentation important
Detect trends/onimous anomalies		Epidemilogical investigation, diagnosis		Spread, duration, virulence
Investigate and characterize events/incidents (epidemilogical investigation, deployable capability, lab testing, rapid assessment)	Epidemiological-Hazard Response Team. Microbiological Response Team. Special Pathogens Outbreak Response Team			Deployable epidemiological capability missing. Rapid funding mechaism needed

Table 10: Capability Inventory

Step 4 Identifying Capability Needs and Assessing Capabilities

The intent of Step 4a is to exploit SME and employ collective judgment to identify and define requirements. A well-crafted scenario will be a powerful asset. It provides a referential departure point framing the risk and will provide sufficient familiar background information to allow participants to appreciate the environment, visualize an emergency, and conduct a systematic capability needs analysis via a thorough and repeatable assessment process.

A workshop provides the preferred means for engaging in an interactive dialogue and determining capability requirements. It offers a structured and focused forum for eliciting expert judgment, creating consensus, and identifying outliers. Some preparation can be done beforehand, notably, if time permits, review of the capability framework and capture of capability elements as they relate to tasks with the help of decision support tools. It is envisaged that capability requirements will be recorded using the capability framework.

The intent of Step 4b is to then assess how well current capabilities measure up; the assessment criteria (i.e., Adequate, Serious Shortfall, Critical Shortfall) is applied to each of the capabilities and related tasks the scenario invokes. Reference should be made to (and note taken) if not already done of lessons learned and findings of other related analyses. Shortfalls should be attributed to the capability elements (i.e., people and organization; policies, processes and practices and infrastructure, technology and tools (e.g. systems)). This also provides an opportunity to complete the inventory commenced as part of the capability needs analysis and to record people, process and technology elements associated with a capability. Additional detail could include whether the shortfalls addressed are attributable to a complete lack of a capability, a qualitative gap or quantitative gap (insufficient capacity). It is suggested that non attribution be used so that participants feel free to offer expertise. Not all may consider themselves qualified to offer opinions on some capabilities; it is recommended that they be encouraged to contribute but not pushed to venture outside their comfort zone. Ideally, time will permit a subsequent go round offering them an opportunity to review the initial assessment and add to a collective dialogue.

Step 5 Documentation and Presentation

A report of proceedings should be generated to record conclusions, commenting on both the capability assessment methodology and capability framework/task inventory (recommending refinements) and the findings (capability surpluses and shortfalls). It is critical that the findings be well documented and clearly presented. The data collected will support generation of both a 'scorecard' providing a snapshot of capability gaps and capability domain and people, process and technology perspectives. This scorecard will be an aggregated capability profile and reflect best professional judgment. In the event that one capability element (e.g. people and organization) is considered to represent a critical shortfall and hence result in mission failure, the aggregate should reflect this finding. However, if one or more contributing capability elements presents a serious shortfall, it will be necessary to apply expert judgment in determining an aggregate 'score'. An illustrative example based on known shortfalls in the HP is provided below (Table 5).

Cambility	Caulomanaa	Prevent	Prepare	Respond	Recover
Capability	Governance	Deenle	Deenle	Decele	Deenle
Governance: Develop strategy and establish	Реоріе	People	People	Реоріе	Реоріе
collaborative managerial/accountability/decision	Process	Process	Process	Process	Process
framework(s)	Technology	Technology	Technology	Technology	Technology
Risk Management Identify characterize and assess		People	People	People	People
and ricks		Process	Process	Process	Process
diulisks		Technology	Technology	Technology	Technology
		People	People	People	People
Planning: Develop and maintain plans		Process	Process	Process	Process
		Technology	Technology	Technology	Technology
Knowledge Management: Develop and maintain		People	People	People	People
systems and protocols enabling		Process	Process	Process	Process
information/intelligence sharing		Technology	Technology	Technology	Technology
Deserves Management Develop and existin		People	People	People	People
Resource Management: Develop and maintain		Process	Process	Process	Process
minastrucure, procure and mobilize material resources		Technology	Technology	Technology	Technology
Human Resources: Recruit, develop/train, mobilize		People	People	People	People
human resources addressing standing, surge and		Process	Process	Process	Process
sustain demands		Technology	Technology	Technology	Technology
Communications. Establish systems and excited in		People	People	People	People
communications: Establish systems and protocols		Process	Process	Process	Propce ss
enabling public communication and education		Technology	Technology	Technology	Technology

Table 11: Illustrative Scorecard

Full Spectrum Scenario Management System (FSSMS)

A Microsoft Access-based tool is under development which will support risk and capability assessments. Specifically, it will support a relational database and automation. It will enable creation, storage and sharing of Master Event Lists (MSELs) and scenarios to support both exercise design and capability assessment. It will also facilitate distributed teaming, allowing for an automated elicitation of SMEs as a prelude to an interactive review and refinement of initial results. Examples of how the FSSMS might be used to support event selection and scenario generation (Figure 9) and distributed assessment (Figure 10) are shown below.







Figure 29: FSSM Screenshot – Capability Needs Assessment

Conclusion

Capability assessment represents a key step in transitioning from risk identification and risk analysis to validating EM plans, visualizing risk treatment options and investment planning. It is part of an integrated process across all relevant departments, agencies and organizations (including non-government organizations and the private sector as required) reflecting recognition that threat, vulnerability, and consequences cannot be managed in isolation, thereby necessitating a coordinated emergency management approach. A cross-government, holistic and comprehensive perspective coupled with a systematic assessment methodology is required. A capability-based mission, function, task approach offers a means to link strategic objectives to program activities and to promote transparency and accountability. It provides a structure for dialogue, for noting challenges, evaluating proposals and monitoring progress.

Capability assessment is intended to link planning to programming and budgeting. The key objective is to inform EM plans and investment planning. One of the critical success factors is to achieve an appropriate level of detail while striving for simplicity and practicality; capability assessment differs from planning. Its focus is more on inquiry and framing the challenges of complex public safety and public security problems than on options analysis and specific asset employment. Differences between the architect and the engineer provide an apt analogy. The former interprets requirements and proposes a blueprint; the latter develops detailed implementation plans. At the same time, sufficient detail is required to enable trade-offs to be distinguished and to guide investment decisions. Capability assessment must note detail and concurrently illustrate aggregate risks and benefits - supporting choices and the allocation of limited resources to satisfy future demands which cannot be anticipated and/or defined in detail in advance.

plement a national w and sustain public sources. Learning from SARS 2003 as in the event CSA Stds Roundtable H1N1 June 2010 Promote development of new vaccine technology. Develop mechanisms fro apid funding and Canadian Pandemic Influenza Preparedness (Sep 12 Draft) uck in this area. Not sure processes are in place. Stortage of Phythysicians at PHAC and attrition tricreas introversite. Biour retraining policy, No recontinent policy. Recultimentand retrationate recontinent policy. Recultimentand retrationate publishess. n an incident occurs - but on basis there is work to be ut not recognized. Is part of surveillanc. search. tically within the HP mandate. Green but e improved cles Act other and prevent onal Health Regulations (IHR) nough being done in this area. have this in place well. HP SEP •K. This provides direction where sources can/should be directed. ngtools may not be optimal lotes t comes together when ar in ongoing peacetime basi book horo Research in New Bruns Need First Nations iden-look arr Quarantine Act abilities 1L 2M 2H 11 2M 2H IL IM IH Criticality 11.4M 3H 4M 3H HE WZ 1M SH HE WZ 2M 3H ZM 4H 2M GH 2M 3H HE WP ZM 3H 1M 4H 1M GH HE WE HE WZ 1M SH 1M SH HZ WT νz 4G 1Y 1R 3G 1Y 1R Capability 3G 3V 2G 3Y 1G 2Y 1G 2Y 4G 1Y YS 2V 42 S9 6G 2Y 2G 3Y 4G 1Y 2G 2Y 1R 1G 2Y 2R 6G 1V 3G 2Y 1G 2Y 1G 2Y **VE 92** 3Y 2R 1G 2Y 3V Infrastructure, fechnology, and Tools 76.37 1G 2Y 1G 2Y 7G 1Y 3G 3V 1G 3Y 1R 6G 1V 3G 2Y 1G 2Y 1G 2Y 1G 2Y 3G 2Y YS 2Y VS 29 4G 1Y 4G 2Y 3G 3Y 2G 3Y YE 95 SG 1Y 3A 3Y 2R Infrastructure, Technology & Tools cies, Processes l Practices 3G 1Y 1R 4G 1Y 1R 3G 1Y 1R 16 2Y 16 2Y 1G 2Y 2R 1G 2Y 6G 2Y 2G 4Y 36.3Y 2G 3Y 3G 2V 1G 2Y 1G 2Y 2G 3Y SG 2V 6G 2Y 5G 1Y 6G 1Y 3V 4G 2Y 4Y 1R Policies, Process & Practices ional MAF Organization & People 3G 1Y 1R 4G 1Y 1R 1G 2Y 16 ZY 1G 2Y AG 2Y 2G & 2G 3Y 1G 2Y 1R 1G 2Y 2R 1G 2Y 1G 2Y 4G 2Y 5G 2Y VS 20 5G IY 4C 2A SG 2Y 3G ZY 3V N 95 2G 3Y VHD, CA/US Cross-Barder WG People & Organization of onal mandate and structure, roles & ision ding to priorit iring gram i.e. public olio Public Heal th Portfol io Tasks sh stockpile and production criter understand social behaviou indards and certification nce Investment and allocate -oss BM stages and capabilities velop and maintain put ucation & awareness evelop and publish nativ afety/Security strategy nabling legislation efine/darify HP -sponsibilities and regulatory regimes Capability nationa strategic planning communications hips ess risk Capability Groups Prevent Common Full Spectrum Scenario Timeline Minus 4 (Long Term)

lish objectives, metrics and auditing

These pages are extracted from excel spread sheet- use view zoom to see details more clearly

CAA Strids Broundeblieden H19811 Lower 2000	Canada's pan indemice plans are a can common baseline of preparedness antiche grass most evel to ensure a natiche-wide standard or forer and an delity to provide manual support		Canada's parademic pee paredeness plans lacke da se verity index which would have helpe diguide decision making	Gup e kits in our pandemic daming to the type soft scenarios. Parchwock plans contributed to confluction on the provinterstant actual on inverse deliver provinces and provinces contrusted deliver provinces and provinces contrusted daming standards - including risk daming standards - including risk daming standards - including risk daming standards - including risk daming standards - including risk										
Learning from SAIS 2003				A ungent requirement for multi- juited riction of planning to create integrated protocols for outbrack management	Co should rever with travel screening techniques and protocold with a web no encurate that travel core inig measures are based on evidence for policite afth fereivenence, taking into a cocurat the financial and human mis-ources regaring.		A containing distration (chordrow) and containing distration (chordrow) and containing distration. Bordrow and containing and containing and containing and a set of the shift information.	Canada's proctices in i soung tawe! discrime sound to environ the disal Nr Inhe context of a disal Nr Inhe context of a mail attent in a sussessment of the basis share, pask, and impact of advice to travel lies.	the creation of a new F/P/T Network for Communicable Disease Control.		The need to mobilities selected groups of skilled personnel into epidemic response its ans within the field manwork, complement of the analequate complement of quarantine officers is maintained at all ports of entry	Supp ort and enhancement of the public heal th infrastructure neossary for surveillance, rapid takon stry day nots and timely interventions for eme aging and exargent infections.	A national vacine strategy. A major minrigoration of the Matton al immunization Strategy. Impove tracking systems for vacination core rage.	fisure that there is an effective communications thereary for inter-trian disease with contact points for the travel industry.
Canadian Pandemic Influenza Preparedness (Sep 12 Chaft)		improve stateholder perticipation in pand emic preparedness	Improving strategies for communicating risk and uncertainties				Develop integrated electronic AM						Establish the requirements for <i>F /P/T</i> to divulge Medi of Countermeas ure inversion for a countermeas une time mories (products, quantities, location & expliny dates)Develop faster antivitial production	breiop and streeghen cuitopant process and gudin o for establishing socialitienty and distribution of mesualities
Note s	Sow decisions. We II ensconced committe es. Potential delays in decision for deployment e.z. Affects Canada's reputation and influence.	HP protorged approval process. This sets thus people need pactice. Established groups experi ence with respect to other events.	Barly risk asses sment - but non- scientific. Well encoconced committeres. Step encoconsed. Gui des the pace of response.	Staff tumover is an issue. Promotes all huzard perpendenses and cross- govt and ron govt communities.	SPP:less important frantfrientifring official business processes. Well performed. Low during this phase.	Preplanning highly important templates ideal but not critical.	We have took - prodem is the second product of the product of the lowest christer if the most product of the lowest christer if the most product of advector is shown on the product of advector is shown on the product of advector of advector advector is advector of advector advector advector advector of advector advector advector advector of advector	Been done in H1N1, M85, H2N9 etc. This is communitation of oricial Fragarcia action. Need to act requirements and get agreement in This space. Data sharing and Frast Nation denominator. Still on paper- base of system.	IL from HIML. Not all SMEshave common vytehm. Exists. Due to umoertainty of flu, hi ghy i mportant bo two sMEs ready and working earthy. Many SME are outside HP. There is no accessible eN bool that inne-mortes SME networks.	Lack of trained IMS staff. Need to think of mew opabilities to pansue. Need to be afte to pursue business as usual in addition to pandemic. Requirements not fully identifie d. Umited process. No HP trading Sylem.	More training needed. Requirements need to be Indentifie d, pe opte traine d, records Rept. Re stiming a knowledgable in- Proue Ream.	Good Position.	First MCM available.	frow your suddreck in preparing message, to do diferent bancehs innoled, dorf have a single group upped proper percors. It is communities process divergoid hittis, head result operators do reveal interest in PMAS. Core and interest in PMAS. Core and programs are from two different banches and for on their egicval programs are droom to address the media
 ssessment Criticality	11 6M 3H	2M 9H	2M 6H	3M GH	21 4M 4H	3L 3M 4H	HB WS	HLWE	H9 WS	11 GM 3H	11 SM 4H	11 IM 4H	2M 6H	21.3M 4H
 Overall A Capability	4G 5Y	6G 3Y 1R	76.1Y	76.27	96 5 V	6G 4Y	AP 96	76.27	96 2Y	4G 4Y 1R	1677	26 4Y	AE DS	86.1Y
Infrastructure, Technology, and Tools	4G SY	56 SV	4G 3Y	7G 2Y	56 4Y 1R	6G 3Y 1R	106 JV	6G 3Y	7G 4Y	4G 4Y 2R	2G 6Y 2R	3G 3Y	4G 4Y	761718
Infrastructure, Technology & Tools							Овт експок М баз заловов						NAS, NESS	6HAC Initia Juntement Site
 Elements Policies, Processes & Practices	3G 6Y	8G 2Y 1R	6G 1Y	6G 3Y	5G 5Y	6G 4Y	90 aV	75 2V	8G 3Y	4G SY 1R	3G 7Y	2G 5Y	6G 2Y	66 3V
 Capability Policies, Process & Practices		Bie, NEKS					Maak (nordpred) ink apreed							
Organization & People	6G 3Y	7G 3Y 1R	6G 1 Y	6G 3 Y	5G 5 Y	6G 4Y	106.3V	8G 2 Y	9G 2 Y	5G 3Y 2R	IG 8Y IR	3G 4 Y	6G 2Y	861Y
re opte & Organization		934		MHO, CA/US Cross-Border WG										
Health Portfolio Tasks	Es tablish mutual aid agreements	Es tablish incident management, governance structure and decision proces ses	Assess Risk	Develop and maintain pandemic response contingency (interventions) and communication guidelines. Set immunization guidelines.	Identity Critical business processes and publish SOPs	Preplan responses and develop templates	Bevelop in formation and Bevelop in formation and not contrain start and and protocoment start and and with provide start evers and with global community)	Determine information requirements/reporting thresholds (Indicators & Warning levels)	Establish SME communities and IT networks	Determine training requirements	Train, qualify and position HP personnel	Identify and protect critical infrastructure, including supply chains. Prepare mass campaign infrastructure.	Maintain stockpiles of anti- virals	Develop tallored/fargeted public education & aw areness program
Capability		Ma nage relationships	Assess risk		Plan - develop and maintain operational, contingency and business continuity plans			wariage da un marchi and intelligence			Manage Human Resources	Manage materiel and	infras tructure	Manage communications
Capability Group		Governance						Common						
field Constraint Constant Transline							(-2) Enforcement and	Inspection						

					Charadi's pandenic plans need a common basel ine of persparedness at the parsonic steer is be manic state and nation who standaris date and an ability to provide wirm main support from should be developed and plans should be developed and evaluated broadings natural	
	stablish Health Emergency Response Teams	fraining exercises to test multi- jurisdictional protocols.		A rational strategy for surveillance and control strategy for surveillance and control comergeners the appendix surveillance the strategy and the adjoint strategy and the surgeint infections intergene and exagent infections and surveillance and adjoint adjoint and adjoint and adjoint adjoint adjoint adjoint adjoint adjoint adjoint organization adjoint adjoint strategy for major for adjoint ad		
Need for improvement. Not specific to flu. <i>Hways</i> ready.	Very territorial in ICS. HR always sensitive issue. Insufficient number of people trained. Some processes documented but not all.	Proce sees for ide ntifying that ning and exercise requirements is good. Support for cross-training.	BCP not well done and MML. There are critical programs that require are critical programs and the main number of people shared. <i>Invareness</i> of processes, plans, and procedures is limited.	cool preparaton.	Not sure these are actually done or have of hosts processes lidens field for ANR processes, but process for approval and implementation for action needs work and support.	
HE M 3H	21 4M 2H	7M3H	H9 WE TE	Ŧ	HEW9	HI
3G 5Y	26.7V	7G 3Y	2G 6Y 2R	76 24	76.3Y	16
3G 4Y 1R	4G SY	5G 4Y	4G 3Y 2R	40 SY	8G 2Y	16
4G 4Y	4G SY	6G 4Y	3G 5 Y 2 R	6G 3V	76 3V	16
multi-province/international licens ure						
3G 4Y 1R	32 Y2 Z6	7G 2Y 1R	3G 5Y 2R	76 29	AE 92	16
Es tablish readiness posture. Maintain capability invantory	Maintain immediate/emergency response teams	Develop and conduct training/exercise/rehearsal programs. Cross-train	Validate operational, contingency and business contingency plans	Provide Early Warning - epideniology surveillance, pre-position, alerting and pre-position	ldently/address preparedness shortfalls	Federal regulation in place for approval of drugs and vaccines during a pandemic (IEUNDS)
		Maintain incident/attack response capability		Maintain Surveillan ce and Situational Awareness	Audit prepared ness	
				Prepare		
				(-1) Focussed Intelligence		
						i.

					Constraints and and and						
		. Andrew State		Organization & People	Capability Elements Polidies, Processes & Practices	Infrastructure, Technology, and Tools	Capability	essment Criticality	Canadian Pandemic Influenza		book and a margin lines t
		Establish/attivate incident management governance structure and decision processes	Establish/activate incident management governance structure and decision processes	4G 2Y 1R	5G 2Y	463Y	5G 3V	HB	o event of this significance has even happened or een exercised. Structures, people, training not respect for an event of this magnitude.		energy and a second
	Governance	Etablish/st hote consequence management	pre antrons exerciseurs un adeune an un service and projectore and	4G 2Y	46.27	26 4Y	AP 98	IMSH			Lack of coordinated business processes across under the coordinated business processes across institutions and jurk discretion for outbeak management and entre greavy resizence. Indequated in institutional outbeak magement potons, indequated in institutional public discretion and the previous health anvices system.
		ping many processor	recount process conduct repid autorement - dentify, due écteriae and evaluate (specific) des-	76 2Y	76 ZY	86 IY	76.1V	£	A many second second and the possible bud and do not a second and the possible bud and do not a second and a second and a second and a second second second and a second second and a second second second second second second and a second sec	The need for boaker risk management framework with more mitigation efforts	
		Plan - Develop incident Action Plans	Recommend cares and control management measures. Set immunitation Recommend cares and control management measures. Set immunitation Action Plans.	45 4Y	56 ZY JR	66.27	4G 3V	н жи 11	owns in too late. Processes exist but not practiced this scale. Sustainability of capability and pace of stoores will pose a challenge. Vaccine priority	There was considerable variability in the H1NL vir impact which made consistency in planning and response more difficult. There is a need to review infectious disease and pandemic research to	31
		Manana data Information Intellinance and in	Access/exploit special stexperi #	5G 2Y	75 2Y	3G 4Y	3G 5V	#	epends on SME. Depending on the situation, capertise can be a challenge. Access through the PrDC.	It was difficult in some provinces to obtain timely and exact information relating to treatment and spread of the HIX1 influenza	
		HARINGE GOLD, HIVEI RUNN, HILEHGURG CHEN BUNN	Share information with peers and partners. Manage data	561Y	56 2Y	4G 2Y	4G 2V	H	stabilish governance structures through the HPO. 1USA not signed but should happen anyway.		Absence of protocols for data or information sharing among levels of government. Uncertainties about data ownership
			Manage personal protective equipment	4G 1Y	3G 2Y	4G IY	3G 2Y	1M4H	c measures. Controversial issue.		
			Develop, testand authorize vaccine (medical countermeasures)	46.2 V	4G 2V	4G 2Y	4G ZY	2M4H	ritical de cision.		
			Produce/procure antivitals	7G 1Y	76 IY	6G 2Y	4G ZY	H	ensitive to the anti-wial. There has to be options. rocesses exist, quantity may be an issue. There are ther considerations.		
		Manage Materiel and infrastructure	Receive, stage and store antivirals and vaccines	56.2Y	N2 95	5G 2Y	4G 3Y	7H S	torage can be an issue. Antivirais to be added to re formulary.		
	Common		Allocate and administer anti-kiral and voccine distribution	4C 2V	4C 2V	4G 2Y	3G 3V	MSH B	In it depend on PT capabilities. Areass the considing for your capabilities. Areas is the rounder galance. Neted constrained on the entral such such so information primely, and secompanied by communication plans.	Current guidelines on antiviral use require review	
(+1) Onsite Response			Augment in formulation collection, analysis and EOC staffs	26 4Y 1R	30 3V	4G 2Y	3C 3V	1M4H	Respective advects an issue in these situations. coccess point technicidger may recti, that ability to point and support is a succentiment. Mappens turt not leader situation is noncomment, and anging dispetivens like missi		
		Manage Human Resources	thrammisting & Single Control One Workers	3V 1R	1G 3Y	ñ	ñ	¥	eed to improve call blocation link's between public with an off-prove call blocation link's between public set to an off-prove call blocation link specimica. The set of the set of the set of the set of the set was any population of the set of		
			Manage Public Health Care Workers (Surge and Sustainment)	4Y 1R	1G 3V	1G 3Y	ъ	5 5	eed to improve callaboration links between public ealth and primary care based on H1N1 experience.		
			Notify internal authorities and partners	6G 1 Y	6G 1Y	6G 1Y	6G 1Y	ВН			
		Manage Communications	Public Communitations and Aerting	6G 3Y	7G 2Y	7G 2V	86334	H8 WI	Phas a crisis communications plan, and his concreted and an enclose of the sume provisionment. A second and any concrete of a plane unity and a second and a plane and a plane of a plane unity and a second and a plane and a plane of a plane and a second and a plane and a plane and a plane and a plane and a second a second a plane and a plane and a second a second a second a second a plane and a second a second a second a second a plane and a second a second a second a second a plane and a second a second a second a second a plane and a second a se	A need for constraint mersaging, information on personal protectives quajoment variant concised specific ensuity. An integrated <i>FFPT</i> commission body comprised for medical office and distant management experts houd be are dealed and topologic bottomers) freques variant provide bottomers).	2
	tespond		Maintain epidemiological surveillance. Monitor threat alerts & advisories (Warning & indicators)	561Y	56 IV	4G 2Y	4G 1Y	44	n i T platform would assist to maintain si tuational watensis recording.		
			Detect trends and anomalies	561Y	5G 1Y	4G 2Y	5G 1Y	H9			
		Detect incidents	Investigate and disinsterize events/indents (spidemological investigation, deployable capability, lab testing, rapid assessment)	AT 98	AI 99	40 IV	46 IY	1M 4H			Dagnosis rested on dinical syndrome. Available laboratory trists were mic consistently help ul. Difficuties with threely access to laboratory testing and results. I nadequate capacity for epidemiological investigation of the outbreak.
			Confirm/V erify incident/attack	2G 2Y	3G 1Y	2G 2Y	2G 2Y	1M4H	eed to have a complan to share these events.		
			Direct tactical operations e.g. First Responders, Case and Contact Management	1G 2Y	16 I Y	2G IY	1G 2V	1M2H	eed to all coate more HR in these situations.		Lack of surge capacity in dinkal and publichealth systems
			Conduct emergency triage and pre-hospitalization	2Y	1G 1Y	1G 1Y	ź	2H			
		Manage On-Site response. (Incident Command)	Secure the site. Contain and control the incident/attack (solation, Quarantine)	1G 1Y	16 I Y	161Y	16 1Y	ZH			
			Dispose of hazardous material (devices)	2G 1Y	261Y	26 IY	26 IY	*	5 measures. ur rouls is the newvide suidance and pre-suidance		
			Preserve (e.g. provide guidance) responder health and safety	36.1Y	3G 1Y	3G 1Y	3G 1Y	4H	ur role is to provine guidance and pre-guidance.		

Still establishing agreements. Timeliness is an issue along with data sharing.	Some concern about sufficient staff ensuring	is a concert river of neural infected and	not at work.	Important to avoid raising uncertainties	Critical !	Mostly delivered by P/Ts. Not sure we have a concrete plan in the HR world. This needs to be considered. Coordinated arrangement with local hospitals when First Nations rangements on reserves need to be MEDEVACT for trittical fare, especially if need to be MEDEVACT for trittical fare, especially if need to be MEDEVACT for trittical fare, especially if need to be first sure are as the first sure are as the first sure and the first sure are as the first sure are as the first sure are as the first sure as the first sure are as the first sure as the first sure are as the first sure as the first sure are as the first sure as the first sure are as the first sure as the first sure are as the first sure as the first sure are as the first sure are as the first sure are as the first s	current arrangement with local hospital can no longer accommodate because at full capacity.	Not aware of mass fatality plan. Issue not significantly explored. Not well defined mass storage for deceased.	Contract in place.	Dependent on estimates/proxies, passive surveillance of P/T surveillance of tracking mechanisms.	Not in a position to get timely data and update compliance adverse events and effectiveness of antiwalasca an intervention. Better suited to recenth at the time		
ЗН		1M 4H		ЗН	SH	11 2H		1L 1M 2H	1M 3H	ЗН	Ж	Η	ΗI
1G 2Y		4G 1Y		1G 2Y	4G 1Y	2Y 1R		3G	2G 1Y	1G 2Y	2G 1R	ΥĽ	τ
2G 1Y		4G 1Y		2G 1Y	3G 1Y	2Y JR		3G 1Y	3G 1Y	1G 2Y	2G 1Y	ΥĽ	Υ
1G 2Y		3G 2Y		2G 1Y	3G 1Y	2Y 1R		3G 1Y	4G	1G 2Y	2G 1R	IY	łY
2G 1Y		3G 2Y		1G 2Y	3G 1Y	ZY IR		3G 1Y	3G 1Y	1G 2Y	2G 1R	IY	τ
Monitoron scene response			Liaise with peers and partners. Focus and direct multi-agency collaboration.	Maintain public order	Mitigate consequences, implement disease control strategies		Evacuate, shelter/shelter-in-place and feed citizens	Manage fatalities	Produce/procure vaccines	Monitoreffectiveness (and adverse effects) of vaccines	Montherseffectives of fativese drine reactions) antivirals	Monitor effectiveness of programs	Monitor market for counterfeit antivirals and communicate to the public.
	Coordinate Support to Operations							Manage Consequences					

						Capability Elem	hents			Overall Ass	essment	
uli Spectrum Scenario Timeline (+3)	Capability Groups	Capabilitties	Health Portfolio Tasks	People & Organization	Organization & People	Policies, Processes & Practices	Policies, Processes & Practices	Infrastructure, Technology & Tools	Infrastructure, Technology, and Tools	Capability	Criticality	Notes
	Governance	Manage relationships	Establish recovery management governance structure and decision processes	Serior Offices responsible for EM.	4G 3Y	Domestic group on (NSOs) EM MOU(PS and Red Cross)	4G 2Y 1R		5G 2Y	4G 2Y	11 2M 3H	Return to pre-event structures?
		identify, characterize and assess longer term (e.g. cotal/reputational and environmental) risk(s)	Identify and track long term health effects		2G 4Y		1G 6Y		1G SY	SY	11 1M 3H	Mandate of the P/Ts – by extension then GC. Very low investment from the troud dae asked, but don't level heleve there would be any processes in place to do so. Maple limited personnel availability. Tracking seeds to be emhanded. IT for tracking needs to be designed. This sure this would be as a proficity caregit for research program Area contact agreements regarding stuational awareness.
			Restore community trust		2G 2Y		2G 1Y 1R		2G 1Y 1R	2G 1Y 1R	1M 3H	Notsure that we have processes. We have the capability but success is dependent on community perceptions which may not be altered by our capabilities.
		Man - Develop and maintain recovery plans	Adjust and implement plans to restore HP services and capabilities and contribute to economic and community recovery		26.67		19.6V		4G 4Y	1G 7Y	1L SM 2H	From an HP program perspective, these don't exist. Do not believe processes in particular every planning, all covery nut wells. In control and practiced in exercise. Not cale in how HP feets in to whice of government plans. Little training in recovery the ass. Were done before on all age scale. Plans should already be developed. ERR meets to now kur hit NI to be done a large cafre of indekulas to pull from to ensure response staff can return to work without being burmout. The demokilization plan can be kereaged to support free or recovery plans. Supported by the recovery phase to support free?
	Соттоп	Manage data, information, intelligence and knowledge	Manage data, information, intelligence and knowledge		4G 1Y		4G IR		4G 1R	4G IY IR	1L 1M 3H	Important for prevention measures. Impovements could be made to provide an EM platform for information management. EPR needs to work with HK to develop, alwage coaft of inforduals to pulitform to work without being burnt out.
(+3) Recovery and Remediation		Manage Human Resources	Demobilite surge/sustain resources (including deactivation of volunteers as required)	Capacity may be a concern.	2G 6Y	Lack of de-exclusion and business resumption plans.	2G 6Y		4G 5Y	2G 6Y	2L 5M 2H	We are OK so far but never had an event as severe as this scenario. Important humous are the Recover versa havenge and evolve response structures, plans, and mechanism. Loss of issues to deal with such as priority group to start the process with and resuming previous work, etc. Ordporte Services processes within the IMS.
			Address and administer compensation		3G 4Y		3G 3Y 1R		3G 2Y 2R	3G3Y 1R	4M 2H	Managers of overtime, post-stress issues, and extended sick leave.
			Dispose of used/contaminated materiel		5G		5G		5G	5G	11 2M 2H	IPC measures in place. Virus will not survive long outside of the human body – more of a waste mgt issue. AANDC needs to be consulted.
		Manage material and infrastructure	Recover unused materiel		4G, 2Y		4G 1Y 1R		4G 2Y	4G 2Y	2L 3M 1H	Issues are notreturned to the NESS. May be felt as unnecessary at the community level with lack of collaboration. AANDC needs to be consulted.
			Refurbish/replace equipment. Restock NESS.		76		76		76	6G 1Y	1L 1M 4H	Presess in place to restock. This will be after the shortage is allevated. OK if done gradually or mid/long-term basis. Criticality depends on demants created by other incidents. AANDC and PHAC need to be consulted.
		Manage communications	Re-establish community trust		3G 1Y		3G 1Y		3G 1R	3G 1Y 1R	1M 3H	Need to work with P/T and community leaders for a strong unified message. Will need to address remaining controversies such as long term effects of vaccines.
		Restore services and capabilities	Restore HP services and capability		2G 5Y		3G 2Y 1R		3G 2Y 2R	3G 2Y	1L 2M 3H	No Recovery plans for programs at this time apart from high level BCPs
		Provide long term care and assistance	Provide long teerm care and assistance		1647		1637		163Y	163Y	11 1M 3H	Not available. Psyco-social care should have higher priority.
	Recover	Determine and share lessons learned	Conduct post-incident/event analysis .		106	Capability Assessessment improvement process.	10G		9G 1Y	96	11 4M 3H	After Action Report (and AIR) process is well-established. Processes in place its assumed that recorreces would be provided. Expectations are that this cam be done quickly. Greater incorporation of leasons learned meets to be integrated into the preparedness and response phases.
			Identify and share Prevent/Prepare mitigation measures	Through various international committees / networks.	86		6G 2Y		8G	6G 1Y	11 2M 3H	Sharing lessons learned in a timely fashion remains a sginficant challenge. Interdepartmental LL processes are not clear and often ad hoc and unique to each event.

Feedback Questionnaire

Thank you for attending today's capability assessment workshop. Please provide feedback so we may improve future workshops to meet your expectations and needs.

Please answer the following questions using a scale between 1 (strongly disagree) and 5 (strongly agree).

The topics covered at today's workshop were relevant to your area of responsibility.

1 2 3 4 5

The capability assessment methodology was well explained and the scenario provided sufficient, supporting context.

2 3 4 5

The facilitators provided clear, relevant, and comprehensive guidance to help you complete your assessment.

2 3 4

The agenda (time allocation) and length of workshop was appropriate.

1 2 3 4 5

Please indicate if you are interested in receiving a copy of the workshop report and taking part in similar events.

Report: Yes No Participation: Yes No

Additional comments you may wish to provide:

1

1

5

Methodology

- [1] Centre for Security Science. Draft Target Capability List Canada, Defence R&D Canada, January 2012.
- [2] Christopher, Gary, Debbie Blakeney, Roman Petryk, Ben Taylor, Leonard Kerzner, Van Fong and Mark Ball. Strategic Capability Roadmap Version 1.0 Analytical Framework, Defence R&D Canada, CORA TR 2009-013, December 2009, <u>http://cradpdf.drdcrddc.gc.ca/PDFS/unc92/p532766.pdf</u>
- [3] Chuka, N, L. Cochran, S. Friesen, D. Hales, LCdr Harnett, C. Morrisey, and P. Race. Development of the Force Planning Scenario Framework: Inputs for the Scenario Analysis Tool, DRDC CORA CR-2010-017, 1 February 2010
- [4] Emergency Management Planning Public Safety Canada, All Hazards Risk Assessment Guidelines 2012-2013, <u>http://www.publicsafety.gc.ca/prg/em/emp/2013-ahra/_fl/2013-ahra-eng.pdf</u>
- [5] Hales, Doug and Peter Race. Public Safety Technical Program Planning Scenario: Technical Report, Defence R&D Canada – Centre for Security Science, CR 2010-10, December 2010, <u>http://cradpdf.drdc-rddc.gc.ca/PDFS/unc103/p534210_A1b.pdf</u>
- [6] Hales, Douglas and Peter Race. *Applying a framework for defining emergency management scenarios*, Journal of Emergency Management, Volume 9. Number 1, January/February 2011
- [7] Hales, Doug and Paul Chouinard. Implementing Capability Based Planning with Public Safety and Security Sector: Lessons from the Defence Experience, Defence R&D Canada – Centre for Security Science, TM2011-26, December 2011, <u>http://cradpdf.drdcrddc.gc.ca/PDFS/unc122/p537217_A1b.pdf</u>
- [8] Ministers Responsible for Emergency Management. An Emergency Management Framework for Canada Second Edition, Public Safety Canada, January 2011.
- [9] Lewis, Leslie, Bruce Pirnie, William Williams and John Schrader. Defining a Common Planning Framework for the Air Force, RAND, Santa Monica, California, 1999, http://www.rand.org/content/dam/rand/pubs/monograph_reports/2007/MR1006.pdf
- [10] Robinson, Neil, Agnieszka Walczak, Sophie-Charlotte Brun, Alain Esterle and Pablo Rodriguez. Stocktaking study of military cyber defence capabilities in the European Union, 2013, http://www.rand.org/pubs/research_reports/RR286.html
- [11] Samaras, Constantine and Henry H. Willis. Capabilities-Based Planning for Energy Security at Department of Defense Installations, RAND, Santa Monica, California, 2013.

- [12] Schrader, John Y., Leslie Lewis, William Schwabe, C. Robert Roll, Ralph Suarez. USFK Strategy-to-Task Resource Management, RAND, Santa Monica, California, 1996, <u>http://www.rand.org/content/dam/rand/pubs/monograph_reports/2007/MR654.pdf</u>
- [13] U.S. Department of Defense. Capabilities-Based Assessment (CBA) User's Guide, Version 3, Force Structure, Resources & Assessments Directorate, March 2009.
- [14] U.S. Department of Homeland Security. Target Capability List: A Companion to the National Preparedness Guidelines, September 2007.

Influenza Pandemic

- [15] Lansdowne Technologies Inc. Risk Assessment of Reliance on Foreign Produced Pandemic Influenza Vaccine Version 1.0, March 2009.
- [16] Lansdowne Technologies Inc. Risk Assessment of Reliance on Foreign Produced Pandemic Influenza Antivirals Version 1.1, May 2009
- [17] Lansdowne Technologies Inc. City of Ottawa H1N1 Pandemic Influenza After Action Review and Lessons Learned Report, 16 July 2010
- [18] Loose, Verne W., Vanessa N. Vargas, Drake E. Warren, Shirley J. Starks, Theresa J. Brown and Braeton J. Smith. Economic and Policy Implications of Pandemic Influenza, Sandia National Laboratories, March 2010, <u>http://prod.sandia.gov/techlib/accesscontrol.cgi/2010/101910.pdf</u>
- [19] National Advisory Committee on SARS and Public Health. Learning from SARS: Renewal of Public Health in Canada, October 2003, <u>http://www.phac-aspc.gc.ca/publicat/sars-sras/naylor/</u>
- [20] Public Health Agency of Canada. The Canadian Pandemic Influenza Plan for the Health Sector, December 2006, <u>http://www.phac-aspc.gc.ca/cpip-pclcpi/</u>
- [21] Public Health Agency of Canada. Tool Kit: Pandemic Influenza Exercise for the Health and Emergency Social Services Sectors Edition 3.1, July 2008.
- [22] Public Health Agency of Canada. Canada Pandemic Influenza Preparedness: Planning Guidance for the Health Sector, Draft 22 March 2013.
- [23] Public Health Agency of Canada. HP Emergency Response Plan Final Draft 28 March 2013.
- [24] The Zeta Group. Exercise GLOBAL GRIPPE: Pandemic Influenza Emergency Simulation Project for the Agri-Food Sector Final Report.
- [25] Trust for America's Health. Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism, Robert Wood Johnston Foundation, 2012.

- [26] U.S. Department of Homeland Security. Pandemic Influenza: Preparedness, Response, and Recovery: Guide for Critical Infrastructure and Key Resources, September, 2006.
- [27] World Health Organization. Outbreak Communication: Best Practices for communicating with the public during an outbreak: Report of the WHO Expert Consultation on Outbreak Communications held in Singapore 21-23 September 2004.
- [28] World Health Organization Evolution of a Pandemic: A (H1N1) 2009, April 2009-August 2010, 2nd edition, 2013.

List of symbols/abbreviations/acronyms/initialisms

NAME	DEFINITION
AANDC	Aboriginal Affairs and Northern Development Canada
ADM	Assistant Deputy Minister
ADM EMC	Assistant Deputy Ministers' Emergency Management Committee
ADM NS OPS	Assistant Deputy Ministers' National Security Operations Committee
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
BCP	Business Continuity Plan
BGTD	Biologics and Genetic Therapies Directorate
CBSA	Canadian Border Services Agency
CCG	Canadian Coast Guard
CDC	Centers for Disease Control and Prevention
CEPC	Centre for Emergency Preparedness and Response
CF	Canadian Forces
CFIA	Canadian Food Inspection Agency
CI	Critical Infrastructure
CONOPs	Concept of Operations
CPHLM	Canadian Public Health Laboratory Network
CSS	Centre for Security Science
DFATD	Department of Foreign Affairs, Trade and Development Canada
DG	Director General
DM	Deputy Minister
DM EMC	Deputy Ministers' Emergency Management Committee
DND	Department of National Defence
DRDC	Defence Research and Development Canada
EC	Environment Canada
ECDC	European Centres for Disease Control
EM	Emergency Management
EMA	Emergency Management Act
EOC	Emergency Operations Centre
Epi-ERT	Epidemiology Emergency Response Team

EHPPR	[Office of] Emergency Health Planning, Preparedness and Response
ESF	Emergency Support Function
FCG	Federal Coordination Group
FCO	Federal Coordination Officer
FERMS	Federal Emergency Response Management System
FERP	Federal Emergency Response Plan
FIORP	Foodborne Illness Outbreak Response Protocol
FNEP	Federal Nuclear Emergency Plan
FNIHB	First Nations and Inuit Health Branch
F/P/T	Federal/Provincial/Territorial
GC	Government of Canada
GOC	Government Operations Centre
GPHIN	Global Public Health Intelligence Network
HC	Health Canada
HERT	Health Emergency Response Team
HP	Health Portfolio
HPEC	HP Executive Group
HPEPC	HP Emergency Preparedness Committee
HPFB	Health Products and Food Branch
HPOC	HP Operations Centre
HP SAT	HP Situational Awareness Team
HP SEMP	HP Strategic Emergency Management Plan
HR	Human Resources
HVI	High Visibility Incident
IAP	Incident Action Plan
IHR	International Health Regulations
IMS	Incident Management System
IM/IT	Information Management/Information Technology
MERT	Microbiological Emergency Response Team
MSEL	Master Scenario Events List
NESS	National Emergency Stockpile System
NML	National Microbiology Laboratory

NML OC	National Microbiology Laboratory Operations Centre
OERS	Office of Emergency Response Services
OPLAN	Operations Plan
РАНО	Pan American Health Organization
РСО	Privy Council Office
РНАС	Public Health Agency of Canada
PHEIC	Public Health Emergency of International Concern
PS	Public Safety Canada
PWGSC	Public Works and Government Services Canada
RCMP	Royal Canadian Mounted Police
RECC	Regional Emergency Coordination Centre
R&D	Research & Development
SAT	Situational Assessment Team
SEMP	Strategic Emergency Management Plan
SITREP	Situation Report
SME	Subject Matter Expert
SOP	Standard Operating Procedures
TC	Transport Canada
TCL-C	Target Capability List – Canada
TTX	Table Top Exercise
UN	United Nations
WHO	World Health Organization

Glossary

all-hazards risk assessment (AHRA)

The process of identifying, analyzing and evaluating risks using an all-hazards approach.

back-casting

An established methodology for exploring preventative and preparedness measures (i.e. identifying policies and programs which would have precluded the incident or mitigated the consequences long before the incident occurred). It is the opposite to "forecasting."

business continuity plan (BCP)

A plan developed to provide procedures and information for the continuity and/or recovery of critical service delivery and business operations in the event of a disruption.

capability

A combination of resources that provides the means to prevent, protect against, respond to and recover from emergencies, disasters and other types of incidents.

capability-based planning (CBP)

An approach that involves planning, prioritizing and choosing response capabilities that are flexible and interchangeable, based on a detailed assessment of identified threats and risks.

complex emergency

An emergency that is complicated by the involvement of multiple agencies or jurisdictions, by its severity, duration or required resources or by the threat actors or the nature of the target.

concept of operations (CONOPS)

A concise description of how an organization is to operate in order to achieve specific goals.

consequence management

The coordination and implementation of measures and activities undertaken to alleviate the damage, loss, hardship and suffering caused by an emergency.

coordinating department

The department responsible for engaging relevant federal government institutions in an integrated Government of Canada response to an emergency.

critical infrastructure (CI)

The processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being of Canadians and to the effective functioning of government.

critical service

A service whose compromise in terms of availability, delivery and/or integrity would result in a high degree of injury to the health, safety, security or economic well-being of Canadians or to the effective functioning of the Government of Canada.

Decomposition scheme

The organizational structure used to establish the associational relationship between component parts.

discussion-based exercise

An exercise that consists of a facilitated discussion that allows players to familiarize themselves with response plans, policies and procedures, and to explore their application in specific emergency scenarios.

emergency

A present or imminent event that requires prompt coordination of actions concerning persons or property to protect the health, safety or welfare of people, or to limit damage to property or the environment.

emergency management (EM)

The management of emergencies concerning all hazards, including all activities and risk management measures related to prevention and mitigation, preparedness, response and recovery.

emergency notification system; incident notification system; mass notification system

A communication system designed to rapidly and simultaneously deliver time-sensitive messages to a large number of recipients on various types of communication devices during an emergency.

emergency operations centre (EOC)

A designated facility established by an agency or jurisdiction to coordinate its overall response and support to an emergency.

emergency support function (ESF)

An emergency response activity that supports the needs that are anticipated to arise prior to or during an emergency.

event

A significant occurrence that may or may not be planned and may impact the safety and security of Canadians.

federal coordinating officer (FCO)

The person responsible for the overall coordination of a federal emergency response.

federal emergency

An emergency in which Government of Canada institutions are involved for one of the following reasons: a) the emergency is clearly within an area of federal jurisdiction; b) the provincial or territorial authorities request their involvement; c) the emergency affects two or more provinces or territories.

Federal Emergency Response Management System (FERMS)

A comprehensive management model that provides the mechanisms and processes to coordinate the structures, capabilities and resources of government institutions, non-governmental organizations and the private sector into an integrated all-hazards emergency response.

governance

The management structures and processes that support the development, implementation and enforcement of policies, programs and activities.

Government Operations Centre (GOC)

Canada's strategic-level operations centre that coordinates the activities of the hub of a network of operations centres run by a variety of federal departments and agencies during emergencies.

hazard

A potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

incident

An event caused by either human action or a natural phenomenon that requires a response to prevent or minimize loss of life or damage to property or the environment and reduce economic and social losses.

incident management

The coordination of an organization's activities aimed at preventing, mitigating against, preparing for, responding to and recovering from an incident.

inject

An entry of the Master Scenario Events List that controllers put into play to simulate an organization or person and to drive exercise play towards the achievement of objectives.

lesson learned

A lesson identified for which validated remedial action may be implemented, resulting in a tangible improvement in performance or capability.

liaison officer

A federal department representative that serves as a link between the Government Operations Centre and the representative's home government institution.

master scenario events list (MSEL)

A list of injects that outlines the chain of events that a scenario will follow during the evolution of an exercise.

mission-critical

Referring to an organization's services or assets that are vital to the accomplishment of its mission.

mutual assistance agreement/mutual aid agreement

A pre-arranged agreement developed between two or more entities to render assistance to the parties of the agreement.

national emergency

As defined in the Emergencies Act, an urgent and critical situation of a temporary nature that (a) seriously endangers the lives, health or safety of Canadians and is of such proportions or nature as to exceed the capacity or authority of a province to deal with it, or (b) seriously threatens the ability of the Government of Canada to preserve the sovereignty, security and territorial integrity of Canada, and that cannot be effectively dealt with under any other law of Canada.

National Emergency Response System (NERS)

A system that links the federal, provincial and territorial emergency response systems for all hazards and that establishes the process for a provincial or territorial request for federal emergency assistance.

partner

An individual, group or organization that might be affected by, or perceive itself to be affected by, an emergency.

performance measure

A specific data set, objective observation or other finding used to assess the adequacy of resources applied to programs and activities.

preparedness

Actions taken prior to a disaster to be ready to respond to it and manage its consequences.

prevention

Actions taken to eliminate the impact of disasters in order to protect lives, property and the environment, and to avoid economic disruption.

proof of concept

A proof of concept is a demonstration whose purpose is to verify that certain concepts or theories have the potential for real-world application. Proof of concept is therefore a prototype that is designed to determine feasibility, but does not represent deliverables.

public safety

The protection of all citizens by implementing measures that safeguard national security, improve emergency management, combat crime and promote community safety.

recovery

Actions taken to repair or restore conditions to an acceptable level after a disaster.

resilience

The capacity of a system, community or society to adapt to disruptions resulting from hazards by persevering, recuperating or changing to reach and maintain an acceptable level of functioning.

response

Actions taken during or immediately before or after a disaster to manage its consequences and minimize suffering and loss.

risk assessment

The overall process of risk identification, risk analysis and risk evaluation.

risk profile

A description of an entity's existing management practices, common vulnerabilities, tolerance and key interdependencies concerning its particular risks, as well as an assessment of their relative likelihood, consequences and priority.

scenario

A hypothetical situation or chain of events that depicts an incident, emergency or crisis and that is delivered to exercise players through a narrative to guide simulation during an exercise.

seeding the assessment

Taking excerpts from relevant reports and adding them to the data in an assessment data base (like a Capability Framework) in order to inform the reader and to "seed" their responses to questions about capabilities and tasks for a certain Capability Group during an assessment.

situational awareness

The continual process of collecting, analyzing and disseminating intelligence, information and knowledge to allow organizations and individuals to anticipate requirements and to prepare appropriately.

situation report (SITREP)

A report that provides current information about an emergency, immediate and future response actions, an analysis of the impact of the emergency and issues identification.

standard operating procedure (SOP)

A reference document that identifies the interactions between provincial, territorial and federal governments in areas of emergency response activities to facilitate decision making and to ensure a coordinated response to emergencies.

strategic emergency management plan (SEMP)

An overarching plan that establishes a federal government institution's objectives, approach and structure for protecting Canadians and Canada from threats and hazards in their areas of responsibility and sets out how the institution will assist with coordinated federal emergency management.

subject matter expert (SME)

A person who provides expertise in a specific scientific or technological area or on a particular aspect of a response.

tabletop exercise (TTX)

A discussion-based exercise in which participants review and explore the response to a specific emergency scenario, but do not perform any actions.

Target Capabilities List – Canada; TCL-C

A reference document that provides a generic model using common language and methodology to be used by Canadian response organizations and all levels of government to inventory the capabilities in place, analyze the gaps and identify the tasks that must be completed to achieve preparedness goals.

task decomposition

The division of broader tasks (e.g. root capabilities) into smaller, simpler subtasks i.e. independent, observable activities. Task Decomposition is used to support Task Analysis which includes developing detailed descriptions of activities e.g. frequency, duration, resources,
complexity, etc. This information can be used to support personnel selection and training, process modelling (including automation) and requirements definition and equipment design.

threat

The presence of a hazard and an exposure pathway.

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This report describes the effort provided by Defence Research and Development Canada's (DRDC) Centre for Security Science (CSS) to support Exercise Perseverance held 13 June 2013. Exercise Perseverance was a table top exercise (TTX) used to assist in validating an assessment methodology and identifying capability requirements and gaps. This report outlines preparations which included generation of a pandemic scenario and creation of a capability framework, and describes the conduct of the TTX. It also summarizes findings related both to the approach and to the capability requirements and gaps relating to mitigation and response to a pandemic

Le présent document concerne la participation du Centre des sciences pour la sécurité (CSS) de Recherche et développement pour la Défense Canada (RDDC) au bon déroulement de l'exercice Persévérance qui s'est tenu le 13 juin 2013. L'exercice Persévérance était un exercice sur table (XT) qui visait à faciliter la validation d'une méthode d'évaluation et la définition des besoins et des lacunes en matière de capacités. Le document expose la préparation de l'XT, qui consistait notamment à créer un scénario de pandémie ainsi qu'un cadre de capacités, la conduite de l'exercice ainsi que les résultats qui se rapportent tant à la méthode qu'aux besoins et aux lacunes en matière de capacités en ce qui concerne l'atténuation et l'intervention en cas de pandémie.

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