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Chemical, Biological, Radiological, Nuclear, and Explosive National Security Defence Preparedness

Major Crystal Kipping-Wyatt

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Major Crystal Kipping-Wyatt

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ACRONYMS

AAFC	Agriculture and Agri-Food Canada
ADM	Assistant Deputy Minister
CAF	Canadian Armed Forces
CANSOFCOM	Canadian Special Operations Force Command
CBRN	Chemical, Biological, Radiation, and Nuclear
CBRNE	Chemical, Biological, Radiation, Nuclear, and Explosives
CBSA	Canada Border Services Agency
CEPRU	Chemical Emergency Preparedness and Response Unit
CFIA	Canadian Food Inspection Agency
CFJP	Canadian Forces Joint Publication
CJIRU	Canadian Joint Incident Response Unit
COVID-19	Coronavirus 2019
CSE	Communication Security Establishment
DAOD	Defence Administrative Orders and Directives
DECON	Decontamination
DND	Department of National Defence
ED	Emergency Department
EMO	Emergency Management Office
FNEP	Federal Nuclear Emergency Plan
FPT	Federal, Provincial, and Territorial
FSDS	Federal Sustainable Development Strategy
GAC	Global Affairs Canada
GHSI	Global Health Security Initiative
GoC	Government of Canada
HAZMAT	Hazardous Material
IAEA	International Atomic Energy Agency
NATO	North Atlantic Treaty Organization
NERS	National Emergency Response System
NSCIOP	National Security and Intelligence Committee of Parliamentarians
NSIA	National Security Intelligence Advisor
NSS	Nuclear Security Summit
OECD	Organization for Economic Co-operation and Development
OGD	Other Government Departments
OPCW	Organization for the Prohibition of Chemical Weapons
PCO	Privy Council Office
PHAC	Public Health Agency of Canada
PMO	Prime Minister Officer
RCMP	Royal Canadian Mounted Police
RPA	Remotely Piloted Aircraft
SOREM	Senior Officials Responsible for Emergency Management
SSE	Strong, Secure and Engaged
SWOT	Strengths, Weaknesses, Opportunities, Threats
UNOCT	United Nations Office of Counter-Terrorism

ABSTRACT

This Directed Research Project will examine Canada's chemical, biological, radiation, nuclear, and explosives (CBRNE) defence capabilities and assess how prepared security and defence institutions are ready to react in the case of a large scale CBRNE event. This examination is required because the conflicts of today are increasingly complicated, diverse, amongst various domains and continuously evolving. In fact, the notion of war is no longer considered a binary concept between conflict and peace nor can it be relegated to only the land, maritime and air domains. It must encompass all potential facets of war where the most damage with the least amount of effort can be the winning achievement. Some theorists have contended that this is where hybrid warfare and hybrid threats, as distinct phenomena, will continue to develop, thrive, and modify the future of war.

For these reasons alone, bioterrorism and by extension CBRNE is a concept that, although is readily acknowledged and understood superficially, has been habitually glossed over when anticipating Canada's defence capabilities to respond effectively. This is particularly apparent in national security strategic documents that highlight the potential for catastrophic events and even theoretically plan for them with *Emergency Management Strategies*, but that inevitably fall flat in terms of adequate planning, preparation, and potential execution of support in the event of a bioterrorist attack.

This study will first look at the evolution of warfare and the new emerging threats that Canada needs to consider in establishing their defence policies and action plans, especially as the impending fourth industrial revolution emerges. Specifically, it will review the national security framework for Canada's CBRNE emergency management readiness plan by reviewing its current CBRNE support capabilities, the strengths and

limitations of its strategic action plan, with an evaluation of foreseeable challenges that could impede a prompt and effective national response. Ultimately, it will provide a perspective of how ready Canada is prepared to react to a CBRNE event and what the Canadian government can do to ensure we are adequately prepared to react to a CBRNE crisis if and when the time comes.

INTRODUCTION

> *War is more than a true chameleon that slightly adapts its characteristics to the given case. As a total phenomenon its dominant tendencies always make war a paradoxical trinity – composed of primordial violence, chance and reason.*
>
> - Clausewitz, *On War*, 1832

A review of the history of warfare reinforces the one constant referred to in the above Clausewitz quote that remains true even in present day. War is ever-evolving, but its primary concentration, or as some strategists refer to as the Centre of Gravity, entails inflicting the most violence where the enemy is the weakest. Whether this be through intra-state conflicts such as civil wars, insurgencies, or inter-state battles, these conflicts offer historical insight into how warfare has experienced its own revolutionary and dynamic development throughout the centuries due to the advent and exponential progress of new, emerging technologies. While classical war theory purports that "the logic of human nature, and by extension political action has not changed throughout history,"[1] it is the material environment and the global technological revolutions of war, or as some refer to as hybrid warfare, which has increased its complexity and a nation's ability to be ready to respond in defence of its people. Ben Zweibelson aptly remarks:

> both the world and our understanding of the world have changed and expanded over time…with more actors, combinations, relationships and accelerated actions due to technological revolutions, there are situations today that have the potential for greater levels of complexity than previously… However, the rapid speed of emergent technologies such as the internet is redefining not just the nature of warfare, but potentially the nature of human civilisation.[2]

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[1] Michael, Handel, *Masters of War: Classical Strategic Thought*. 2nd rev. and expand ed. (London; Portland, OR: Frank Cass, 1996), 1-2.

[2] Ben Zweibelson, "Gravity-free Decision-Making: Avoiding Clausewitz's Strategic Pull," *Australian Army Research Paper* Number 8 (2015): 10. https://theforge.defence.gov.au/sites/default/files/adfwtc03_zweibelson_gravity-free_decision-making.pdf

This is encapsulated by the more recent concept of hybrid warfare which "has become the most common term used to try and capture the complexity of twenty-first-century warfare, which involves a multiplicity of actors and blurs the traditional distinctions between different types of armed conflict."[3] Yet, it must be understood that hybrid warfare is a contested concept. It can be defined differently by how states distinguish or react to a threat and by which inter-governmental agencies may be involved in any type of response.[4] Many contend that hybrid warfare is not a new term in warfare analyses, but rather a concept that incorporates many facets of threats to include conventional, subversion, and cyber tactics. In fact, some authors consider that "any form of conflict can be a hybrid one as long as it does not imply conventional means of combat."[5] For these reasons alone, nations need their military and defence strategic planners to work, think and postulate 'outside the box' of classical warfare theory and consider what combatants may resort to in terms of methods or means of fighting to achieve their objectives, expecting that conventional and non-conventional means of combat are inevitable and expected.

This is where the nascent evolution of chemical, biological, radiation, nuclear, and explosives (CBRNE) weapons brings forth new methods in warfare strategy that need to be considered. Indeed, this is especially the case with the advancement of contemporary hybrid warfare techniques noted during the last century. However, from a CBRNE perspective, it is not always easy to ascertain what malfeasant acts of destruction that an

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[3] James, K.Wither, "Making Sense of Hybrid Warfare," *Connections: The Quarterly Journal* 15, no. 2 (2016): 74. Making_Sense_of_Hybrid_Warfare.pdf

[4] *Ibid*., 74-75.

[5] Razvan Munteanu, "Hybrid Warfare – The New Form of Conflict at the Beginning of the Century," *Strategic Impact* no. 56 (2015): 20. https://www.proquest.com/scholarly-journals/hybrid-warfare-new-form-conflict-at-beginning/docview/1753209782/se-2

enemy combatant may impose. Nonetheless, this 'unknown aspect' cannot discount the potential for swift, catastrophic destruction on a massive scale using any manner of CBRNE.[6] The global community must therefore consider these threats as remaining highly probable in any conflict and explore how to defend against them or respond accordingly. In this sense, it is imperative that Canada look to determine what its effective response would be if a large-scale bioterrorist attack were to occur.

Canadian strategic policies and action plans regarding CBRNE are not as instructive as they could be. In Canada, the current 2017 *Emergency Management Framework* notes that emergency management looks to "adopt an all-hazards approach to address both national and human-induced hazards and disasters."[7] For clarification, this document refers to "human-induced hazards" which could include, but are not limited to, terrorist attacks and hazard materiel incidents. In this directive, it depicts that four interdependent components of the framework that would "contribute to a safer, prosperous, sustainable, disaster resilient society in Canada"[8] include: (1) Prevention and Mitigation; (2) Preparedness; (3) Response; and (4) Recovery. All of these elements are considered in order to develop actionable plans to counteract or respond to any event. This directive also indicates that Public Safety Canada, as the leading department, will construct a strategic framework and actionable, supportable plan with a network of

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[6] Markus K. Binder and Gary A. Ackerman, "Pick Your POICN: Introducing the Profiles of Incidents involving CBRN and Non-State Actors (POICN) Database," *Studies in Conflict & Terrorism*, 44, 9 (2021): 730-754. Of the 224 incidents involving successful "use of an agent," 123 (54.91 percent) resulted in casualties of any type, including those caused solely by the use of conventional weapons as part of the attack. Thirty-one (13.84 percent) events resulted in the deaths of victims exposed to the agent. Ninety-four (41.96 percent) events produced injuries to victims from the effects of the CBRN agent.

[7] Canada. Public Safety Canada, *An Emergency Management Framework for Canada, 3rd ed*. (Ottawa: Public Safety Canada, 2017), 4. https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/2017-mrgnc-mngmnt-frmwrk/2017-mrgnc-mngmnt-frmwrk-en.pdf

[8] *Ibid*., 7.

partnerships from federal, provincial and territorial organizations and other stakeholders to leverage resources and capacities in order to "Be Prepared." What remains unclear is what the actionable plan may be in the face of a CBRNE assault or confrontation. This study will address that gap.

Through a review of the national strategic framework encompassing a CBRNE response, this paper will demonstrate the challenges that Canada is facing in terms of its current emergency management framework in the application of an effective response to a large-scale CBRNE incident. Specifically, this study will argue Canada's national defence policies are not fully appreciating the dynamic aspects of hybrid warfare, especially in terms of the challenges that it will impose. In particular, its national security defence institutions are insufficiently prepared to react and effectively respond to a CBRNE event. This study will also analyze the gaps between government policy making and its ability to effectually ensure its plans are viable and actionable at the lowest tactical level when the time comes to be implemented.

The following four chapters will support this argument through an evaluation of Canada's national response and emergency management framework. Chapter 1 will analyze the nature of warfare, its evolution and impact to warfare tactics and approaches. It will include a discussion of the impending Fourth Industrial Revolution and demonstrate how it will bring forth new considerations that defence strategists need to contemplate, including CBRNE response approaches. Chapter 2 will further assess the strategic intent of Canada's national defence strategies as it pertains to CBRNE, showing that its inter-governmental agencies' plans are limited in scope and will hinder an effective, timely response to a catastrophic CBRNE incident. Chapter 3 will provide insights on how prepared Canada is ready to react to a CBRNE event through an

assessment of the strengths and limitations of the country's current strategic emergency management action plans. Finally, Chapter 4 will provide a summation on how prepared Canada and its national security forces are on their approach to providing an effective response to CBRNE events. It will provide recommendations on steps that Canada and the national departmental agencies should take to develop a more cogent plan in order to reasonably respond to a potential catastrophic CBRNE incident. Ultimately, this study will reveal whether Canada is rolling the dice on its CBRNE preparedness and how prepared it is ready to react to a catastrophic event if it were to occur.

Summary

It is commonly understood that "each age has its own wars and its own forms of warfare."[9] Warfare that is categorized by unique characteristics or distinctive contributions to the overarching theory and practice of future war. However, what is not always fully comprehended is how the progression of distinct, extraneous developments, such as geopolitical factors or technological innovations, have also greatly impacted the consequences of warfare throughout history. More specifically, from what warfare looked like historically to what it presently is and to what it may become in the future.

The next Chapter will discuss the nature of war and how the character of warfare continues to evolve considerably with the advent of dynamic and hybrid warfare techniques. It will demonstrate how CBRNE mechanisms will continue to darken the doorways to many future conflicts and therefore should be incorporated into all defence

[9] Hans-Georg, Ehrhart, "Postmodern Warfare and the Blurred Boundaries between War and Peace," *Defense & Security Analysis* 33, no. 3 (2017): 263. Postmodern warfare and the blurred boundaries between war and peace (oclc.org)

plan considerations. For these reasons alone, Canada and its government need to ensure that we are adequately prepared to react, support, and respond if and when needed.

CHAPTER ONE
THE EVOLUTION OF WARFARE AND THE NEW EMERGING THREATS

Water shapes its course according to the nature of the ground over which it flows; the soldier works out his victory in relation to the foe whom he facing. Therefore, just as water retains no constant shape, so in warfare there are no constant conditions.

- Sun Tzu, *The Art of War*, 6th Century BC

Introduction

In present day, the binary notion of war and peace is no longer as relevant as it was in centuries past. Some theorists contend that war is no longer a singular instrument of policy where statespersons and commanders seek more authoritative or national power. In fact, in more recent years of conflict, there has been a significant increase in the complexity of warfare seen through multiple avenues such as a constantly shifting security environment, global competition through the convergence of geopolitics, and most especially through an exponential growth in technological advancements in information, data processing, and engineering, to name a few. Becker and DeFoor suggest that "significant ongoing changes in the security environment will alter the character of warfare beyond recognition."[10] Likewise, some of the greatest changes that have been experienced in the military field within the last century include blended tactics and operational approaches to conflict which clearly abrogate traditional approaches to warfare. More recently, modern military or warfare strategists have referred to this emergent and complicated environment with a new term annotated as *hybrid warfare*, which will be further discussed later in this chapter.

[10] Jeffrey J. Becker and John E. DeFoor, "Exploring the Future Operating Environment," *Joint Force Quarterly: JFQ* no. 89 (Second, 2018): 121. https://www-proquest-com.cfc.idm.oclc.org/trade-journals/exploring-future-operating-environment/docview/2041571470/se-2?accountid=9867

However, to better understand this evolution of hybrid warfare, it is essential to understand how the conceptual foundations of warfare have been shaped by numerous Industrial Revolutions and the significant impact that they have made on classical warfare perceptions and strategies. Hence, these new developments are shaping new tactical approaches to warfare, which warrant careful contemplation on how defence strategists will need to respond. Nowhere is this truer than with CBRNE and its continued implementation into conflict to evoke maximum destruction with minimal effort. The following will discuss the evolution of warfare with further discussion on how the proliferation of CBRNE cannot be disregarded and thus must be a significant consideration for defence institution planning as we approach the next military revolution.

The Evolution of Warfare

The history of warfare has demonstrated time and again that war is a continuous, evolving concept and infinitely complex. Indeed, even the classical strategists of varying tactics or theoreticians like Sun Tzu, Machiavelli, Clausewitz, Moltke, Jomini, to name a few, assessed years ago that the one constant of war was that its very nature would always be changing, but that at its core it would resort to absolute violence to achieve the state's goals. Yet, while the threshold of violence used to provoke a conflict was ultimately to attack one's centre of gravity to gain the advantage, warfare was ultimately contingent on a number of additional factors or tenets to supports those initiatives.

These strategists further assessed that the political and social climate of the state, available resources, even technological advancements of the era were all contributing influences to the successes of war. Clausewitz aptly referred to these components as the

paradoxical *trinity* of violence, chance and reason.[11] In this, he alluded that the success of warfare was entirely dependent on it achieving a "proper equilibrium among the government, the military and the people."[12] More specifically, Clausewitz's political framework for the study of war encapsulated that the people personified elements of primordial violence through the mobilization of force and the commitments of its state's people.

However, it was the commander of the military force which provided the creative management of risk in warfare. Next, the notion of chance and probability, was described as the space "within which the creative spirit is free to roam"[13] and thus in which the commander was able to achieve strategic objectives. Lastly, the government was identified as the entity that determined the policies and objectives of war in order to determine the overall costs and benefits to the state from the conflict.[14] Ultimately, Clausewitz believed that these three dimensions, each with its particular independent logic of operation, were required in order to achieve victory in warfare. Nevertheless, his theories did not account for the pervasive effects of the industrial revolutions and their additional, albeit unavoidable, direct influence on the future of warfare as well.

The Influence of Industrial Revolutions on the Nature of Warfare

In history, it is instructive to categorize periods of time according to common themes. One useful categorization is to divide eras into individual Industrial and Military

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[11] Clausewitz, Carl, *On War,* trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1989), 89.

[12] Michael I. Handel, *Masters of War: Classical Strategic Thought*, 2nd rev. and expand ed. (London; Portland, OR: Frank Cass, 1996): 11.

[13] Clausewitz, Carl, *On War…*, 89.

[14] Michael I. Handel, *Masters of War…,* 63.

Revolutions (see Appendix 1).[15] Each Industrial Revolution, and by extension Military Revolution, provided momentous technological advances which impacted every aspect of life throughout the world.[16] The contributions that these revolutions brought forth new inventions in manufacturing, medical advancements, discovery of new materials and processes. However, these vast breakthroughs also opened the door to access – knowledge and information that was perhaps not as readily available as before. Therefore, as we approach what many have termed to be the subsequent Fourth Industrial Revolution, humanity needs to assess how those changes will inevitably impact its future.[17]

These major technological breakthroughs will indisputably merge the Industrial Revolutions of the past with the latest technologies in the Information Age. Hence, it should be no surprise that this will catapult society, the states, and its militaries into another wave of enormous change by combining machines and computers in ways that may have only been envisioned in fiction. For these reasons, recent theories and works have further indicated that "the era of disruptive technologies, with the potential to

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[15] F.G. Hoffman, "Will War's Nature Change in the Seventh Military Revolution?" *Parameters 47, no. 4* (2017): 20. Will War's Nature Change in the Seventh Military Revolution? - ProQuest

[16] MacGregor Know and Williamson Murray, *The Dynamics of Military Revolution, 1300-2050*, edited by Knox, MacGregor, Williamson Murray (Cambridge: Cambridge University Press, 2001;2013;2015): 6. The Dynamics of Military Revolution, 1300–2050 (oclc.org). The intrinsic difficulties to understanding the pattern of past revolutions, both military and industrial, "arise from the enormous complexities, ambiguities, and uncertainties in the historical record." The defining feature of the industrial revolutions were that they fundamentally changed the framework of war. As Know and Murray observe, "Five military revolutions have had that effect in Western history: the creation in the seventeenth century of the modern nation-state, which rested on the large-scale organization of disciplined military power; the French Revolution of the late eighteenth century, which merged mass politics and warfare; the Industrial Revolution of the late eighteenth century and after, which made it possible to arm, clothe, feed, pay, and move swiftly to battle the resulting masses; the First World War, which combined the legacies of the French and Industrial Revolutions and set the pattern for twentieth-century war; the advent of nuclear weapons, which contrary to all precedent kept the Cold War cold in the decisive European and northeast Asian theaters."

[17] Klaus Schwab and Nicholas Davis, *Shaping the Future of the Fourth Industrial Revolution* (New York: Currency, 2018), 7-8.

change both the nature and character of war, is swiftly approaching."[18] Thus, the nature of war's essence and subjective character will undoubtedly experience the next revolution of change in the coming years. To fully appreciate this better, it is important to review how significant transformations over the previous industrial revolutions have impacted the future of conflict and warfare.

Over the past 250 years, the three industrial revolutions fundamentally transformed the world and how human beings created value, status, and changed their self-perception. However, it also profoundly changed the trajectory of how these innovations in technological, political systems and social institutions collectively interacted with each other and subsequently impacted our future. The first Industrial Revolution transformed industry from machine tools to steel manufacturing. Then the second Industrial Revolution marshalled civilization into the modern world with the advent of new interrelated technologies which afford better means to communicate and travel such as the radio, telegraph, telephone, television, airplanes, automobiles, and railroad networks. It was this era that was also marked with impressive discoveries and breakthroughs in chemistry, biology, and engineering, some of which precipitated new innovations that would ultimately intersect with previously disparate disciplines in the future.[19]

The convergence of multiple disciplines combined with advanced technologies yielded a third industrial revolution which capitalized on new innovations in distinct industrial sectors such as chemical synthesis, biotechnology, and bioenergy, but also in

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[18] F.G. Hoffman, "Will War's Nature Change …, 19.

[19] Roland Wohlgemuth, *Industrialization of Biology: A Roadmap to Accelerate the Advanced Manufacturing of Chemicals* (Washington, D.C., The National Academies Press, 2015), 30-31.

other sectors of computer engineering, mathematics, and digital computing. The latter developments also fundamentally restructured the world's economic and social systems by its ability to store, process, and communicate information that modernized every industry and changed how society works and interacts. The cumulative impact of these industrial revolutions combined with globalization created an extraordinary increase in wealth and opportunity, especially for advancing economies, which inevitably set the stage for the prevalent race towards the next leading edge technological discovery. Echevarria notes that "globalization and the spread of information technology have made it likely that both sides will generate more – rather than less – chance and uncertainty"[20] as it pertains to warfare and the impact to military and defence forces.

The figure below indicates how technologies, industries and institutional developments contributed significantly to measures of human development over the years, with technological innovation being a considerable driving force.[21] The exponential growth of technologies and systems created opportunity for humans to prosper and advance, both physically and intellectually, at an impressive, albeit alarming rate as seen in Figure 1.1. Technologies such as electricity, water sanitation, modern healthcare, and expansions of agricultural productivity have all contributed to the average person having a longer lifespan, better health, and possessing more economic security than compared to any prior era in history.[22] The impressive advancements that we have

[20] Antulio J. Echevarria II, "Globalization and the Clausewitzian Nature of War," *The European* Legacy, 8, no. 3 (2003): 325. Globalization and the Clausewitzian Nature of War: The European Legacy: Vol 8, No 3 (oclc.org)

[21] Klaus Schwab and Nicholas Davis, *Shaping the* ..., 29-30.

[22] *Ibid*., 6.

seen in the last century should entreat humanity to ask the question of 'what will the next industrial revolution unveil?' and what it may offer the world.

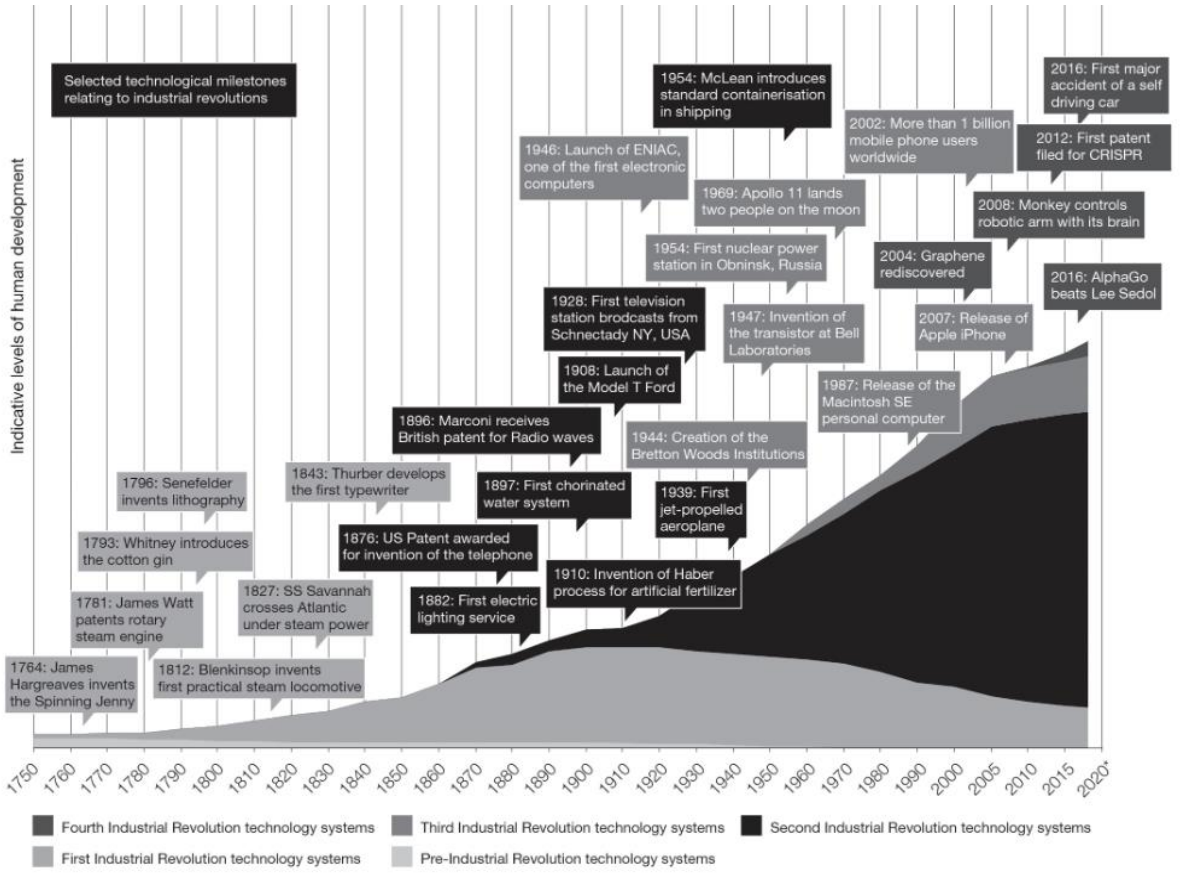

Figure 1.1: Illustrative Contribution of Industrial Revolutions to Human Development: OECD Countries 1750-2017

Source: Schwab, Shaping the Fourth Industrial Revolution, Figure 1

The Anticipated Fourth Industrial Revolution and What It May Bring

According to Schwab, the much anticipated Fourth Industrial Revolution "offers the opportunity to continue the upward climb in human development…that the combination of technological systems and healthy public and private institutions can provide."[23] It should be no surprise that the next evolution of progress will likely further

[23] Klaus Schwab and Nicholas Davis, *Shaping the Future*…., 11.

enhance our personal lives and bring forth additional benefits of improved technological systems, and changes to existing institutions and processes. All of which will offer the improvement to quality of life, increased opportunities, knowledge, and additional securities.

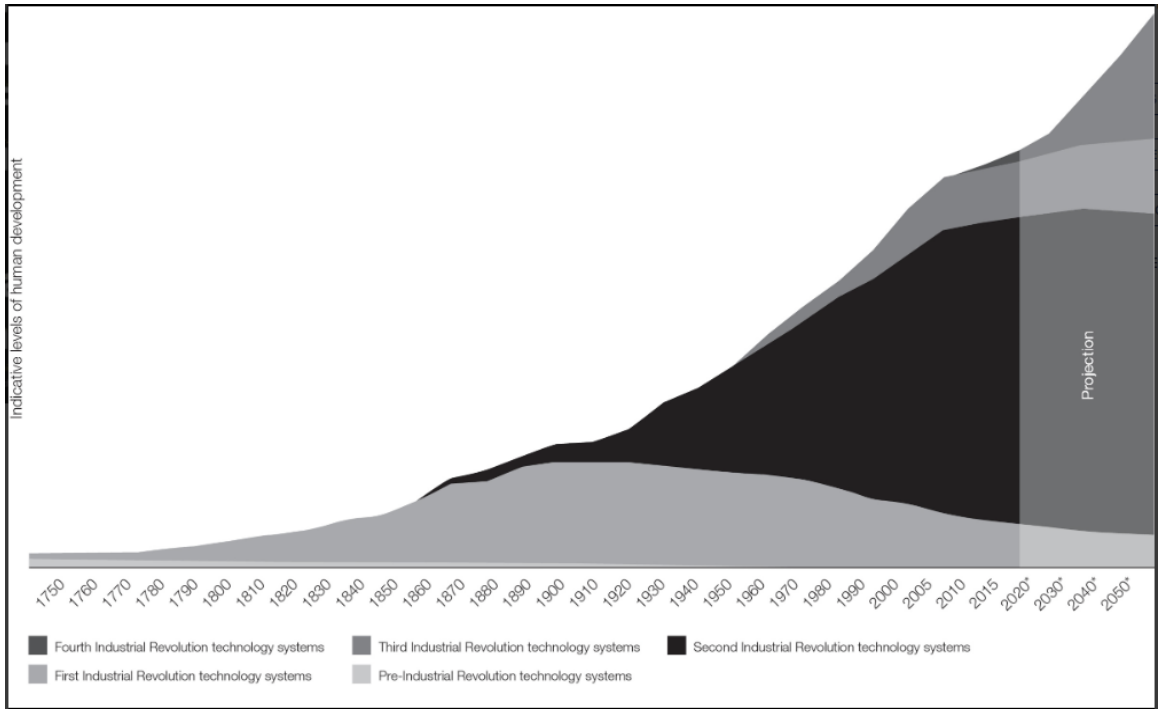

Figure 1.2: Illustrative Contribution of Industrial Revolutions to Human Development to 2050 (projections)

Source: Schwab, Shaping the Fourth Industrial Revolution, Figure 2

Figure 1.2 illustrates the rapid growth that is projected in the coming years which foresees when the Fourth Industrial Revolution will materialize and the projected exponential growth that is expected in human development progress. Here, it is highly probable that the "emerging technologies driving the Fourth Industrial Revolution will build on knowledge and systems of prior industrial revolutions, in particular the digital capabilities of the third Industrial Revolution."[24] This includes the potential for

[24] *Ibid.,* 9, 11.

numerous, but diverse, clusters of technologies seen in areas such as artificial intelligence and robotics, quantum computing technologies, additive manufacturing, neuro-technologies, biotechnologies, new materials, energy technologies, to name a few.[25] Inevitably, when one takes into account the tempest of changes that continue to evolve and those that are inevitably forthcoming, it is clear that the world needs to prepare for the new challenges and concerns that these new and extraordinary developments will present. It should also be expected that the race for globalization and technological advancement will further promulgate a constant state of global competition with the potential for confrontation and maybe even significant conflict to achieve one's state goals. Consequently, the potential harms and risks that will result from the next revolution cannot be minimized, disregarded, or even underestimated.[26]

The purpose to expound on the magnitude of the next industrial revolution, and by extension data information evolution, brings forth considerations for what the potential dark side of these gains in productivity, prosperity, and innovation may generate and how this may impact the future of warfare. The major technological and scientific breakthroughs fueling the next generation also opens the doors for maligned characters or non-state actors to exploit vulnerabilities for their own gains.[27] The advent of progress, as

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[25] *Ibid*., 12.

[26] Jerry W. Champion, "Sixth Military-Revolution: Warfare in the Fourth Industrial Revolution," (Fort Leavenworth, KS: US Army Command and General Staff College, 2019): 82-83. Sixth military-revolution: warfare in the fourth industrial revolution. - Master of Military Art and Science Theses - Ike Skelton Combined Arms Research Library (CARL) Digital Library (oclc.org). The findings in this thesis assert that technology has been the primary catalyst for revolutionary changes to warfare since the expansion of the industrial revolution in the late 19th century following a review of Knox and Murray's *The Dynamics of Military Revolution 1300-2050.* "These technological changes have revolutionized the conduct of warfare in the modern era…now a convergence of a broad range of technologies," the authors note, will serve as a defining characteristic for the 6th military revolution.

[27] Antulio J. Echevarria II, "Globalization and the …, 318.

seen historically, thus precipitates more access and greater risk to state actors when attempting to analyze and estimate what the next combat challenge or attack may be. In other words, it is expected that "the nature and character of war will be changed" and that "numerous implications of war will continue to emerge."[28] Ben Zweibelson's spectrum noted in Figure 1.3 emphasizes how traditional systems may look in comparison to the modern adaptations and how "technological innovation and developments such as global trade, cyberspace and the internet do not alone make warfare 'more complex,' but they do add to the possibilities"[29] that warfare will evolve and transform beyond its current understandings and inevitably become more difficult to predict.

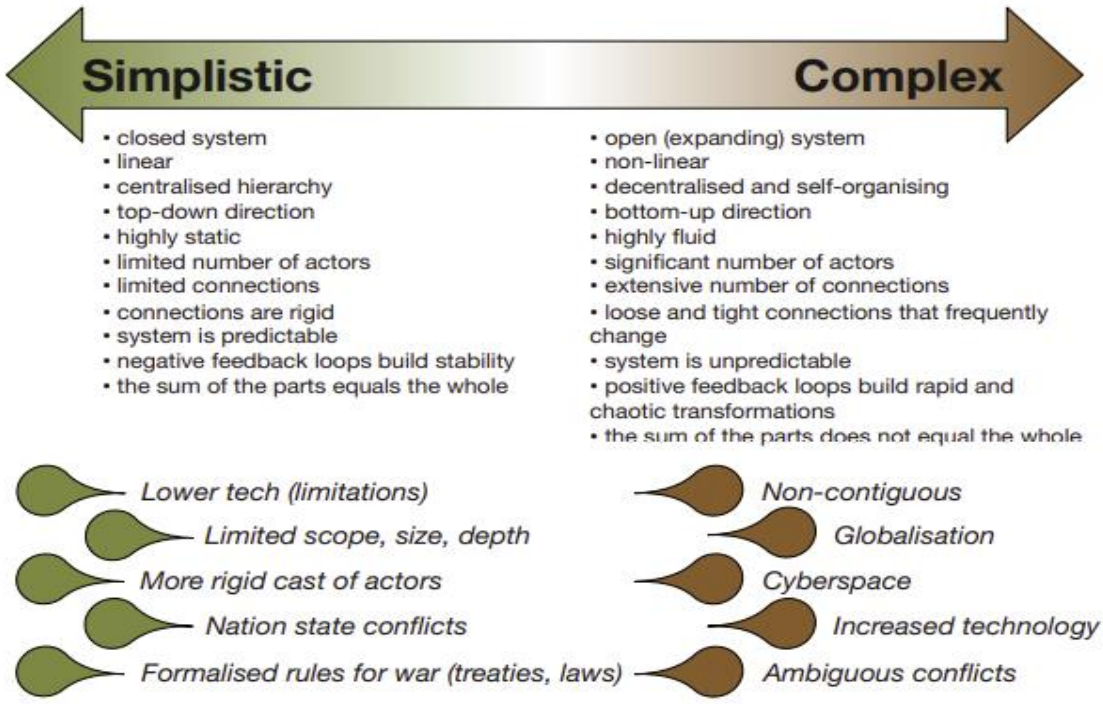

Figure 1.3 Spectrum and characteristics of simple to the complex

Source: Zweibelson, Gravity-free decision-making: avoiding Clausewitz's strategic pull

[28] F.G. Hoffman, "Will War's Nature Change…, 31.
[29] Ben Zweibelson, "Gravity-free Decision-Making…, 11.

Gregory Koblentz, an Associate Professor and Director of a Biodefense Graduate Program at George Mason University, remarks in his article on emerging technologies in the modern world that warrant special consideration as they are becoming increasingly more accessible, are those that involve the use of chemical, biological, radiological and nuclear (CBRN) weapons. Specifically, he notes that technologies such as remotely piloted aircraft (RPA) or drones, the Dark Web, malware, synthetic biology, and 3D printing will present as significant challenges in the next industrial revolution due to increased accessibility and availability.[30] Although these emerging technologies simultaneously present an abundance of opportunity globally, they also provide exceptional prospects to malevolent actors to instigate a fusion of calamitous and devastating effects on their victims if used. These concerns are reinforced by Klaus Schwab, founder and chairman of the World Economic Forum who also stated that "as this process takes place and new technologies such as autonomous or biological weapons become easier to use, individuals and small groups will increasingly join states in being capable of causing mass harm."[31]

To provide further context to these anticipatory changes, it is important to identify the significant changes that unfolded following the Second Industrial Revolution and the two World Wars. Notably, the world observed a progression towards more mechanized warfare with extensive enhancements and inventions in military combat platforms, equipment, armaments, and even tactics. Subsequent battles further demonstrated impressive transformations from traditional forms of conflict to more diverse approaches

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[30] Gregory D. Koblentz, "Emerging Technologies and the Future of CBRN Terrorism," *The Washington Quarterly 43, no. 2* (2020): 178-183. Emerging Technologies and the Future of CBRN Terrorism (oclc.org)

[31] Klaus, Schwab, "The Fourth Industrial Revolution: What It Means and How to Respond," *Foreign Affairs*, 12 December 2015, The Fourth Industrial Revolution | Foreign Affairs

to conventional battles as seen through guerilla warfare, terrorist or insurgency type tactics. After the 9/11 attacks in 2001, the concept of terrorism evolved more quickly due in part to the catastrophic outcome to the loss of life that day, but also due to the more potent emergence and effect that an insurgency can bring forth in terms of political, social and cultural violence in warfare. The unfolding of that day in history created an upsurge of interest in an attempt to understand the impacts of globalization, the evolution of asymmetric warfare tactics, and what the future of combat may look like.[32] While Clausewitz's warfare concept perceived absolute war, distinguished as an idealized extreme which reinforced his trinity as the foundation of warfare theory,[33] it did not sufficiently account for social-political contexts fortified by additional external pressures through technological innovation that we see in modern conflicts today.[34] To account for these postmodern characteristics and variations to conflict, military analysts and theorists started to refer to these novel tactical and fusion approaches in military literature.

The Confluence of the Fourth Industrial Revolution with the Future of Warfare

The concept of hybrid warfare is a unique blend of political warfare intermixed with aspects of conventional, irregular and cyber warfare among varying methods of kinetic and non-kinetic means (see Appendix 2). In 2005, Lieutenant-General Mattis (now retired) of the United States Marine Corps and Dr. Frank Hoffman, a Professor at the National Defense University and retired United States Marine Corps officer, were some of the first theoreticians to depict the concept of *hybrid warfare* as a "mix and

[32] Antulio J. Echevarria II, "Globalization and the Clausewitzian …, 319.
[33] Clausewitz, Carl, *On War,*…, 75-89.
[34] Antulio J. Echevarria II, "Globalization and the Clausewitzian…, 322, 325.

match of forms and modes of warfare to offset conventional military battlefield power."[35] They further elaborated and distinguished what they referred to as a Four Block War, extending former Marine commandant General Charles Krulak's original Three Block War construct.[36] Here, they proposed that war was fought in the trenches on one side while simultaneously providing humanitarian support and struggling to keep warring factions apart on the other two sides. Mattis and Hoffman added their fourth dimension to include the psychological or information dimensions that described "the area where you may not be physically located but in which we are communicating or broadcasting a message."[37] This notion focused on tying in new facets of warfare not previously accounted for in conventional theories, but influenced greatly by technological advancements and political effects.

Other notable military professionals offered conceptualizations of hybrid warfare. U.S. Navy officer Lieutenant-Colonel Bill Nemeth further expounded that hybrid warfare was "the contemporary form of guerrilla warfare that employs both modern technology and modern mobilizations methods."[38] As the theory of hybrid warfare started to gain more favour, Dr. Hoffman then refined his definition in 2007 as "the war that uses conventional capabilities, irregular battle tactics and terrorist actions, including

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[35] Sean Monaghan, "Countering Hybrid Warfare: So What for the Future Joint Force?" *Prism 8, 2* (2019): 84, https://ndupress.ndu.edu/Media/News/News-Article-View/Article/1979787/countering-hybrid-warfare-so-what-for-the-joint-force/

[36] Charles C. Krulak, "The Strategic Corporal: Leadership in the Three Block War," *Marine Corps Gazette* 83, no. 1 (1999): 18-22, The strategic corporal: Leadership in the Three Block War - ProQuest (oclc.org)

[37] James N. Mattis and Frank Hoffman, "Future Warfare: The Rise of Hybrid Wars," *United States Naval Institute Proceedings* 131, no. 11 (2005): 19-20, Future of Warfare: The Rise of Hybrid Wars - ProQuest

[38] Razvan Munteanu, "Hybrid Warfare - the New Form of Conflict at the Beginning of the Century," *Strategic Impact* no. 56 (2015): 20, Hybrid Warfare - The New Form of Conflict at the Beginning of the Century - ProQuest

generalized violence, coercion and criminal activities,"[39] which further encapsulated the complex changes that were occurring in conflict and that were being identified on the modern battlefield. Hoffman also used the term hybrid threats as a corollary to further illustrating the concept of hybrid warfare, which he described as threats ultimately intended to work within the 'grey zone' of conflict. Hybrid threats and their aggressors endeavour to exploit their victims by using multiple means to target vulnerabilities across society and sometimes even through nonviolent actions using cyber-attacks to instigate propaganda, subversion, economic blackmail or sabotage affecting more than just individuals, but government institutions as well.[40]

This is further echoed by the North Atlantic Treaty Organization (NATO). The alliance further buttresses that "what is new about (hybrid) attacks seen in recent years is their speed, scale, and intensity, facilitated by rapid technological change and global interconnectivity"[41] with the decisive aim to destabilize and undermine societies. As such, due to these unique and diverse approaches, Hoffman further concluded that "hybrid threats are profoundly asymmetric and do present the greatest operational risk to forces,"[42] thus making them exceptionally difficult to strategize a force's posture against this threat especially if it is not purely dedicated or adaptive to respond. Ultimately, these contemporary warfare tactics "target all three elements of Clausewitz's 'remarkable trinity' and the complex dependencies between all three which underpin the ability of any state to wield power."[43] It is through the intensity of attacking the trinity combined with

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[39] *Ibid*., 20-21.

[40] Sean Monaghan, "Countering Hybrid Warfare…, 84.

[41] North Atlantic Treaty Organization, "NATO's response to hybrid threats," *NATO* (website), last accessed 15 January 2022, NATO - Topic: NATO's response to hybrid threats

[42] Frank G. Hoffman, "Hybrid Threats: Reconceptualising the Evolving Character of Modern Warfare," *Strategic Forum* 240 (April 2009): 8, ADA496471.pdf (oclc.org)

[43] Sean Monahan, "Countering Hybrid Warfare…, 86.

striking additional elements in the areas of economic, diplomatic, political, information and psychological realms that have further contributed to the evolution of warfare and supported the contention of hybrid warfare theories.

Hybrid Warfare and the Spectrum of Conflict

To understand where hybrid warfare falls in the continuum of competition or conflict, one can refer to the recent United State Marine Corps doctrine. Figure 1.4 noted below illustrates the range of activities on a continuum of competition to explain the range from peace to conventional or total war. This Linear Competition Continuum Model visually offers a perspective as to where hybrid warfare is positioned along the spectrum of conflict, but identifies it as remaining below the threshold of absolute violence. This is where critics of hybrid warfare contend that because of its remaining on the precipice of this threshold that it does not fully constitute warfare. Yet, the doctrine does depict that hybrid warfare falls along the spectrum of conflict and competitive acts, which is marked as being in the condition of "a more or less constant state of tension that in some cases crosses over the threshold of violence, only to recede again below the threshold."[44] Nonetheless, what this new doctrine does demonstrate is that the character of warfare continues to evolve and change, but that hybrid warfare cannot be absolutely disregarded as a fundamental component to changes in future warfare preparations and planning.

[44] United States Marine Corps, *Competing* (Department of the Navy, Washington, D.C., 14 December 2020), 1-7, MCDP 1-4 > United States Marine Corps Flagship > Electronic Library Display (marines.mil)

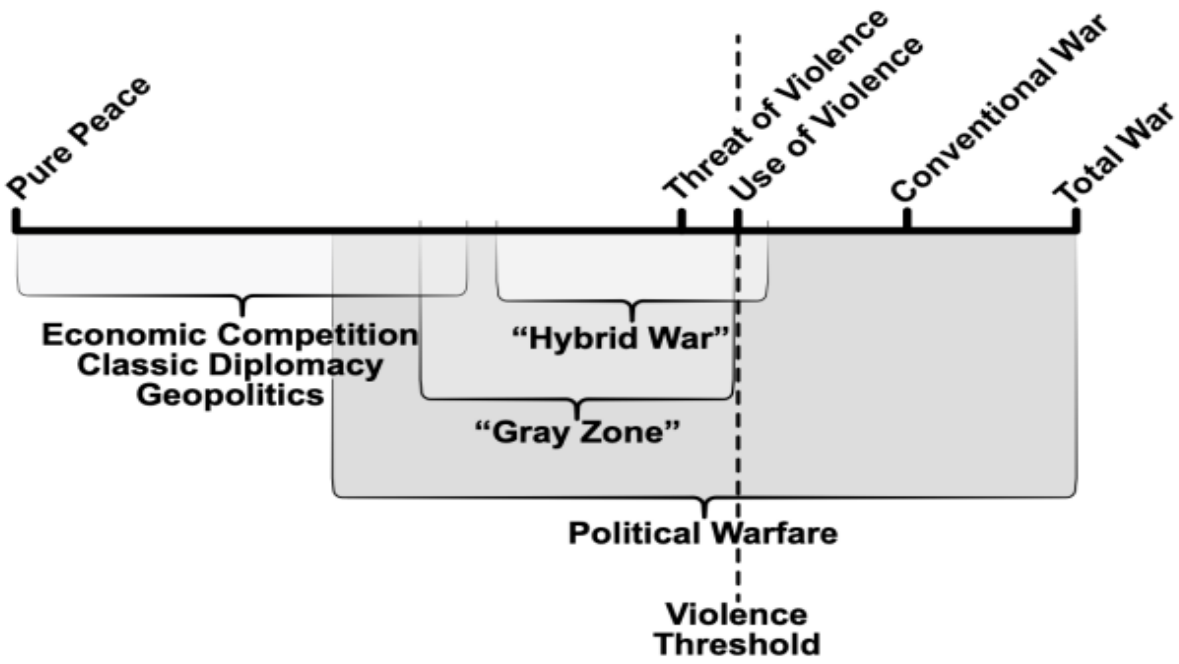

Figure 1.4: Linear Competition Continuum Model

Source: United States Marine Corps, MCDP 1-4 Competing (2020)

Nevertheless, it is important to note that much of the nascent literature on hybrid warfare only really started to gain favour and surface more frequently from 2014 onwards with much focus placed upon Russian presaged hybrid tactics or as critiques of the concept itself.[45] While proponents may define the conceptual underpinnings of hybrid warfare differently, the one resounding commonality among authors is that it is generally characterized by the employment of political warfare which merges collectively with conventional warfare, irregular warfare and more recently with cyberwarfare.[46] This interminable list continues to evolve and will undoubtedly impact the nature of warfare as

[45] Andrew Mumford, "Understanding Hybrid Warfare," *Cambridge Review of International Affairs 33, no. 6* (2020): 824, Understanding hybrid warfare (tandfonline.com)

[46] Sean Monaghan, "Countering Hybrid Warfare: So What for the Future Joint Force?" *Prism* 8, 2 (2019): 95-103; James Mattis and Frank G. Hoffman, "Future Warfare: The Rise of Hybrid Wars," Proceedings 131/11/1233 (November 2005); Qiao Liang and Wand Xiangsui, "Unrestricted Warfare," *News Max Media*, 2002.

it continues to advance at a seemingly exponential rate and regenerate into areas that were previously unattainable.

Ultimately, what the world must embrace in terms of anticipating the context of future warfare, is that "the implications of such profound transformations will directly impinge upon the very concept of conflict, its instruments and its location, and in so many ways will reflect radical departures from the past."[47] With this in mind and taking into account the emergence of the Fourth Industrial Revolution and its projected technological developments, the conceptual realization of hybrid warfare and its tactics will indisputably continue to persist and develop. However, it must be considered that with technological advancements it is inevitable that greater access to innovation and information will become more prolific which should be greatly concerning to all states. In some ways, the "contemporary strategic environment presents adversaries with an array of new, more cost-effective means to employ in combination, ranging from information operations in cyberspace to the proliferation of cheap air defence and missile technology."[48] Nonetheless, the complexity of this anticipated new battlespace only further cements that any strategic defence strategies or responses will need to be agile, adaptable, resilient, comprehensive, and to ultimately anticipate the worst case scenario of what humans can inflict on each other or even conjure in their minds. Intrinsically, nations will need to recognize the increasing importance to understanding hybrid warfare and how the term's principal utility is describing the shifting character of war in which "adversaries employ combinations of capabilities to gain an asymmetric advantage"[49] but

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[47] Randolph Kent, "The Future of Warfare: Are we Ready?" *International Review of the Red Cross* (2005) 97, no. 900 (2015): 1342, The future of warfare: Are we ready? - ProQuest

[48] Sean Monaghan, "Countering Hybrid Warfare…, 85.

[49] Frank G. Hoffman, "Hybrid Threats: Reconceptualising …, 1.

that still remain below the threshold of ultimate violence that would precipitate full out war. Therefore, while hybrid tactics will calibrate a combination of unconventional, irregular and conventional military operations to achieve limited policy objectives, its violence threshold will be managed as a useful policy tool to moderate outright total war. The problem set to determine then becomes what nefarious mechanisms will an adversary use to achieve massive destruction, but exude relative minimal exertion.

Technological Innovations and CBRNE Considerations

It is important to appreciate that for every progressive move forward to enhance global prosperity and the quality of life, historical lessons learned have offered that there is an inescapable dark side to be considered where malfeasant actors may misuse or exploit technologies for their personal gain or philosophies. When considering contemporary warfare, we can determine that some of the most heinous acts were ones that often times required less effort of force or those that required minimal means of physical contact, but had some of the most detrimental effects on the psychological and physical plains. These events such as those experienced with mustard gas in the First World War or the 1995 subway sarin attack in Japan, were catastrophic and extremely difficult situations to manage at those times.[50]

Now more than ever, the continued developments in the CBRNE field combined with technological innovations with drones or synthetic biology, for example, are some of

[50] Andre Richardt, Birgit Huuml lseweh, Bernd Niemeyer, and Frank Sabath, *CBRN Protection: Managing the Threat of Chemical, Biological, Radioactive and Nuclear Weapons* (Weinheim: Wiley- VCH Verlag Gmbh & Co, 2012), 4-8; Dusan Vicar and Radim Vicar, "CBRN Terrorism: A Contribution to the Analysis of Risks," *Journal of Defense Resources Management* 2, no. 2 (2011): 22. CBRN Terrorism: A Contribution to the Analysis of Risks - ProQuest

the most disconcerting, but conversely impressive advancements that we are seeing in history. Vicar and Vicar suggest that:

> an increasing interest of terrorists in chemical and biological warfare agents, an easy access to technical information, technologies, materials and specialist data and an increase of terrorist attacks with the use of chemical and biological weapons highlight the fact that the risk of this kind of terrorism is growing.[51]

To further complicate things, it cannot be forgotten that adversaries are exceptionally dynamic and will continue to challenge all facets of conceptual warfare whether it be in the cyber, space, information domains, or through the more accessible means as they develop in the sphere of biological, ecological, and possibly even with artificial intelligence (AI) sphere. Still, the real crux of these innovations are encumbered by the fact that they can be exploited as presenting a dual-use purpose, used for either peaceful or harmful purposes, but also correspondingly being exceptionally disruptive and even capable of being created or used from one's personal residence. As Koblentz indicates, "the development of these emerging technologies driving these profound changes in society and the economy needs to be safeguarded against misuse."[52] Therefore, it is essential that the new instruments that are created to enrich life through innovation, design, and access warrants more scrutiny in order to enforce proper safeguard measures to protect societies. As an example, the "Profiles of Incidents involving CBRN by Non-state actors" noted in Figure 1.5 below highlight the type of CBRN events that have occurred throughout the world over the period of 1990 to 2013,

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[51] *Ibid*., 21.
[52] Gregory D. Koblentz, "Emerging Technologies …, 190.

which includes plots that were intercepted, successful acquisitions of CBRN material, and actual attacks.[53]

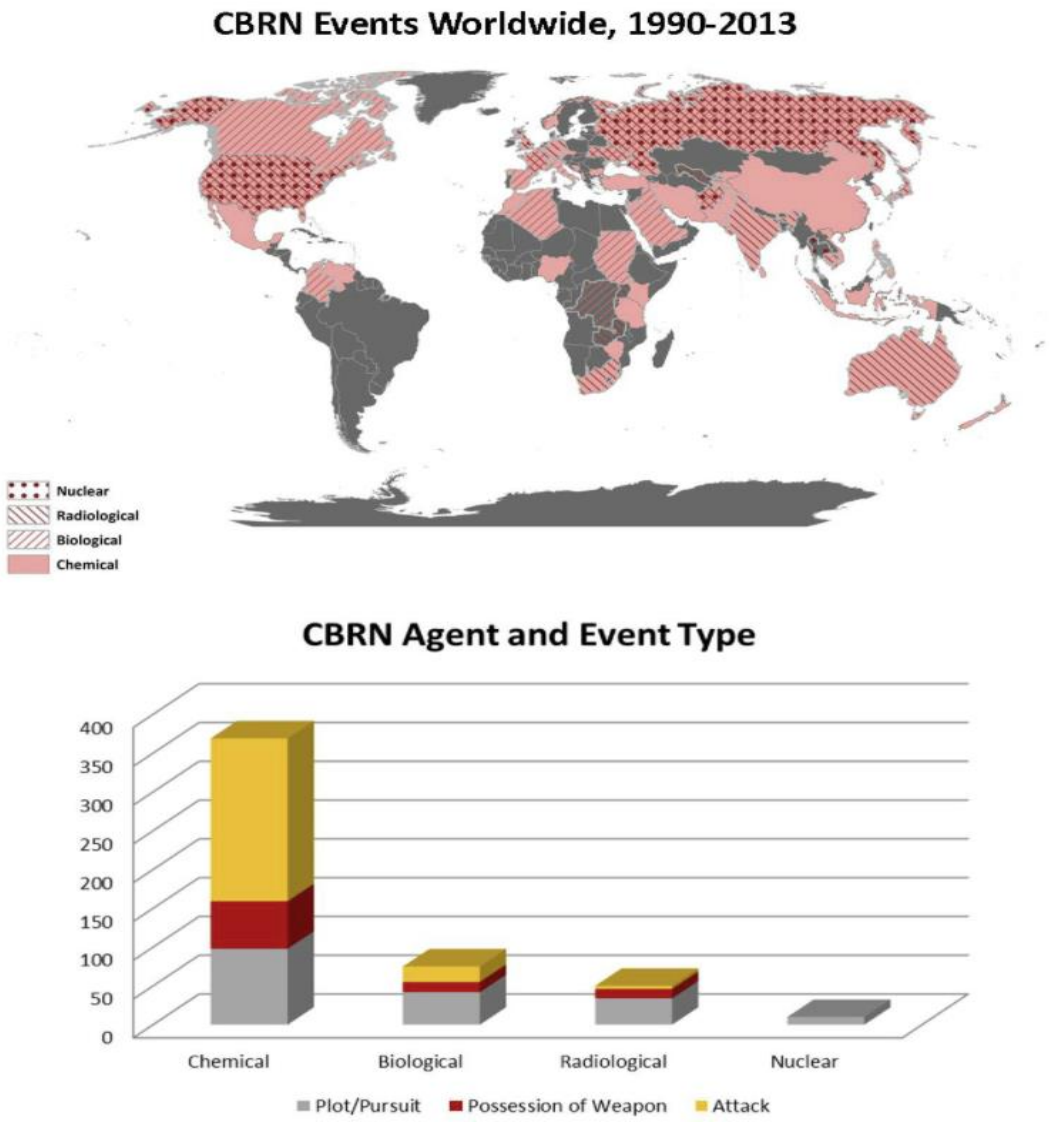

Figure 1.5: CBRN Events Worldwide, 1990-2013

Source: War on the Rocks, 13 August 2014

Predictably, the use of CBRN Agents has become more frequent in the past century due in part to accessibility and technological innovations. Although "an exact

[53] Gary Ackerman, Markus Binder, and Emily Iarocci, "A Global Picture of Non-State Actors and CBRN," *War on the Rocks* (website), 13 August 2014. https://warontherocks.com/2014/08/a-global-picture-of-non-state-actors-and-cbrn/

number of casualties or losses of lives because of CBRN assets usage cannot be estimated, experts agree that the greatest effect of their use will be a large-scale wave of fear and panic."[54] These statistics further intimate that as warfare tactics evolve over time, it will be imperative for the international community and, for the purposes of this study, Canada to take a more proactive approach in managing the conceivable risk that CBRN weapons and agents may deliver. Otherwise, the potential point of failure in lack of planning to effectively respond to these CBRNE events will increase the feasibility that perpetrators will leverage these more easily available, nascent technologies for their maligned purposes to conduct mass casualty attacks.[55] Nonetheless, the inevitable response to anticipate any action is to remain vigilant, proactive, and to never underestimate the potential for an enemy force to use the most heinous, violent forms of aggression against those most vulnerable. For these reasons, it is paramount that national security strategies assess all aspects of a potential threat and how to respond to those that may be the most difficult or severe in terms of effect on the personal, morale, and mental well-being dimensional plains. Accordingly, it is incumbent upon Canada to assess its defence preparedness and determine how ready it is to deal with a potential mass scale CBRNE event as antagonists look to inflict the most damage with the least about of effort.

Summary

A consequence of hybrid warfare suggests that adversaries will always look to inflict maximum destruction with minimal to no effort of force. This is consistent with

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[54] Dusan Vicar and Radim Vicar, "CBRN Terrorism…, 22.
[55] Gregory D. Koblentz, "Emerging Technologies…, 190.

the view that military strategist and philosopher Sun Tzu originally championed by extoling that "supreme excellence consists in breaking the enemy's resistance without ever fighting."[56] However, taking this philosophy into account, it is imperative that nations look to meet these challenges seemingly across all domains. In truth, the one categorical fact that persists in contemporary conflicts suggests that military power alone will be insufficient to deter or defeat aggressors as we progress in the future. Indeed, nothing has become more resoundingly clear in the past century then to acknowledge that defence is now a national security concern. It will require a conglomerate of instruments of power to include the military and other national security elements such as federal public safety organizations, numerous territorial, municipal, provincial, and federal departments, in addition to other allied nations, to coordinate efforts towards strategic and defence action plans. Hence, while the notion of warfare continues to evolve, nations need to anticipate how they will protect and defend themselves which is intrinsically done through adequate anticipation of a potential conflict combined with proper planning of how to deal with an unknown event.

The next chapter will evaluate the Canada's strategic national defence policies as it pertains to CBRNE security and response capabilities. It will look to determine the space between national policy emergency management frameworks and their existing action plans to respond to a CBRNE incident. Finally, it will ascertain what CBRNE defence capabilities Canada currently possesses and how well equipped it is ready to respond to a large-scale CBRNE event.

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[56] Ken Mondschein, *The Art of War and Other Classics of Eastern Philosophy* (San Diego, CA: Canterbury Classics, 2016), 7.

CHAPTER TWO
CANADA'S CBRNE STRATEGIC OUTLOOK, NATIONAL DEFENCE CAPABILITIES AND OVERALL CBRNE PREPAREDNESS

Introduction – Canada's National Defence Preparedness

The evolution of hybrid warfare and predicting the tactics that may be used by adversaries suggests that nations will need to envisage proper countermeasures or appropriate response measures to conflicts. For these reasons, this chapter will look to evaluate Canada's CBRNE Strategy to provide a perspective on where its national security interests and concerns currently stand, as well as its preparations for a response to a potential CBRNE incident. It will delve into the more recent and upcoming directives that are establishing the basis for national responses in the event of an emergency situation. However, to fully comprehend how our national strategies have been created, it is also important to understand how and what they evolved from. Accordingly, this next section will provide the strategic context and objectives of Canada's CBRNE strategies and provide a clarification on how Canada has adopted its current emergency management framework, how it initially originated, and the current strategic direction that has been provided. This chapter will also include Canada's current defence capabilities, its preparedness, and the roles and responsibilities depicted to key stakeholders that possess a vested interest, accountability, and overall remit to the overarching CBRNE countermeasures that our national defence entities are prepared for in the case of an imminent CBRNE threat.

Public Safety Canada

The principal federal agency that manages any response to CBRNE events resides under the Minister of Public Safety who "is responsible for responding to acts of

terrorism."[57] Its federal government website indicates that "in the event of an emergency that poses a risk to public health, Health Canada and the Public Health Agency of Canada play key roles in protecting the health and safety of Canadians whereby the division of specific responsibilities under different departments have been directed. Specifically, in the event of a radiological and nuclear emergency, actions to coordinate a federal response predominantly fall under the purview of Heath Canada. Whereas, if a chemical emergency occurs, the Department takes action through the Chemical Emergency Response Unit by preparing and coordinating a response through the Safe Environments Programme.[58] Further investigation into radiological and nuclear emergency preparedness directives and protocols sees that Canada was the first G7 country to request a review of their Emergency Preparedness mission by the International Atomic Energy Agency (IAEA). The review ultimately assessed "Canada's level of preparedness for nuclear and radiological emergencies based on the IAEA safety standards and international best practices."[59] While this report highlighted that the Government of Canada's commitment to protecting the health and safety of Canadians was apparent, it was predominantly tailored towards the federal authorities and provinces involved with operating nuclear power plants (Ontario and New Brunswick) and did not indicate response measures towards a CBRNE incident. In truth, with further examination of the *Federal Nuclear Emergency Plan (FNEP)*, it becomes quickly apparent that many of the federal directives pertaining to CBRNE incidents lean towards more domestic accidents

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[57] Government of Canada, *2019 Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Events*, last accessed 20 January 2022, Chemical, Biological, Radiological, Nuclear and Explosive (CBRNE) Events - Canada.ca

[58] *Ibid.*

[59] Government of Canada, *International Atomic Energy Agency Emergency Preparedness Review Mission to Canada in June* 2019, last accessed 31 January 2022, International Atomic Energy Agency Emergency Preparedness Review Mission to Canada in June 2019 - Canada.ca

with only a cursory indication of a terrorist "dirty" bomb or CBRNE response. Of note, there does appear to be an emergency plan directive for how to "Get Prepared" for a CBRNE emergency, but there is minimal to no information on the national defence strategies that would be implemented and enforced to manage and effectively deal with a catastrophic CBRNE event on short notice.

The 2017 strategic document, *An Emergency Management Framework for Canada, 3rd Edition* provides direction on how Canada will "Get Prepared" for any potential CBRNE threat. This directive was created in collaboration with all federal, provincial and territorial (FPT) ministers responsible for emergency management to provide a revised version of the 2011 emergency management document. It comments that "in Canada, emergency management adopts an all-hazards approach to address both natural and human-induced hazards, such as terrorist attacks, and disasters"[60] and that the framework establishes a common approach towards emergency management initiatives to ensure the safety and support of the nation's communities. Nevertheless, it important to review the evolution of these CBRNE directives over the years to properly ascertain where the national strategies currently are situated and how they have evolved over the years.

In 2005, Public Safety and Emergency Preparedness Canada produced *The Chemical, Biological, Radiological and Nuclear Strategy of the Government of Canada*. This document aptly provided a background and definition of what was classified as a CBRN incident, which were subsequent to the events that occurred on 9/11 as well as following a number of anthrax incidents soon thereafter. This document was succinct in

[60] Public Safety Canada, *Emergency Management* (Ottawa: Public Safety Canada, 2019), 4. Emergency Management (publicsafety.gc.ca)

providing its strategic aim which was defined as "protecting Canada and Canadians by taking all possible measures to prevent, mitigate, and respond effectively to a potential CBRN incident,"[61] as well as clarifying the overarching strategic concept of the CBRN Strategy. The strategic objectives were intended to support the Government of Canada's National Security Policy with the intent to prevent or reduce the impact of a potential CBRN incident. It further illustrated the essential components of an inclusive approach for all levels of government and indicated four strategic objectives in order to achieve the CBRN Strategy's aim, which were: (1) Prevention and Mitigation; (2) Preparedness; (3) Response; and (4) Recovery. The most remarkable aspect of the 2005 strategy delineated the actual roles and responsibilities of federal departments and agencies which are depicted in the figures below. Impressively, the major departments noted in the figures 2.1 and 2.2 provided further context to a reader as to the principal areas of responsibility and the strategic parameters that these entities would work on or respond to in the event of an actual CBRN incident.

[61] Public Safety and Emergency Preparedness Canada, *The Chemical, Biological, Radiological and Nuclear Strategy of the Government of Canada* (Ottawa: Public Safety Canada, 2005), 3. rslnc-strtg-rchvd-eng.pdf (publicsafety.gc.ca)

Department	Department Agency	Role
Public Safety and Emergency Preparedness Canada (PSEPC)		PSEPC has the lead responsibility in implementing the Government of Canada's National Security Policy. It is responsible for coordinating the Government of Canada's overall response to terrorist incidents, including CBRN incidents, occurring within Canadian jurisdiction and coordinating federal support to provinces and territories.
	Canada Border Services Agency (CBSA)	CBSA administers Canadian laws that govern international trade and travel, and manages the nation's borders. CBSA also protects Canadians and Canadian society from threats to health, safety and security, by ensuring a secure border, open to legitimate trade and travel.
	Royal Canadian Mounted Police (RCMP)	The RCMP is responsible for conducting law enforcement operations to prevent and respond to CBRN terrorist incidents.
	Canadian Security Intelligence Service (CSIS)	CSIS provides the Government of Canada with advice about emerging CBRN threats that could affect national security and public safety of Canadians.
Department of National Defence (DND)/ Canadian Forces (CF)		DND is responsible for supporting domestic operations with CBRN military expertise, intelligence and scientific support. The CF are responsible for the military defence of Canada, providing operational support to a CBRN response, supporting international counter-proliferation efforts, producing CBRN-related intelligence, and providing forces and assets to support the war on terrorism.
	Defence Research and Development Canada (DRDC)	Within the Defence portfolio, DRDC provides CBRN research and development response support, and coordinates the Government of Canada's CBRN Research and Development/Science and Technology efforts.
	Communications Security Establishment (CSE)	Within the Defence portfolio, CSE provides the Government of Canada with foreign intelligence about CBRN threats and capabilities, in support of national security and international non-proliferation efforts.

Table 2.1: Roles and Responsiblities of Federal Departments

Source: The CBRN Strategy, Public Safety, 2005

Department	Department Agency	Role
Health Canada (HC)	Public Health Agency of Canada (PHAC)	HC and its PHAC are responsible for coordination with other government departments on emergency planning, preparedness and response to national public health emergencies. HC has a leading or coordination role in mobilizing national resources, provides a response capability and expert advice to a CBRN incident as it relates to public health and welfare. It also protects Canadians and Canadian society from threats to health under the *Quarantine Act* at the nation's borders.
Environment Canada (EC)		EC regulates environmental emergency planning at fixed facilities that manage toxic and other hazardous materials (non-radioactive), and provides response support (scientific and technical advice on chemical fate and effects, dispersion and trajectory modeling, clean up and recovery) for unplanned or deliberate releases of such substances.
Transport Canada (TC)		TC has overall responsibility for transportation security in Canada including powers under the Transportation of Dangerous Goods Act to assign duty to respond, intervene, provide liability protection, recover costs, and have access to industrial emergency response teams during transportation accidents. This is achieved through the activation of approved emergency response assistance plans. TC provides technical response information and advice by professional chemists on a 24/7 basis through CANUTEC. TC also provides on-site assistance and direction through Remedial Measures Specialists.
Canadian Nuclear Safety Commission (CNSC)		The CNSC regulates the production, possession and use of nuclear substances, including emergency planning at nuclear facilities. The CNSC also supports lead agencies by providing response support (scientific and technical advice) for incidents involving nuclear substances.
Fisheries and Oceans Canada (DFO)/ Canadian Coast Guard		DFO supports lead agencies responding to CBRN incidents affecting Canada's territorial oceans and inland waters or maritime vessels.
Department of Foreign Affairs and International Trade (DFAIT) - Foreign Affairs Canada (FAC)		DFAIT - FAC is the coordination lead for Canada's response to terrorist incidents, including CBRN incidents, outside of Canada involving Canadian or Canadian interests. FAC is also responsible for negotiating international agreements on controls of CBRN-related materials and technologies, and is the lead for non-proliferation, arms control and disarmament efforts. FAC coordinates international CBRN assistance to other states and serves as the clearinghouse for related requests. FAC is responsible for implementing Canada's contribution of up to $1 billion over 10 years to the *Global Partnership Against the Spread of Weapons and Materials of Mass Destruction*, with the aim of preventing terrorists from acquiring weapons and materials of mass destruction.
Department of Foreign Affairs and International Trade (DFAIT) - International Trade Canada (ITCan)		DFAIT - ITCan is responsible for export controls of CBRN-related materials, and for providing key market intelligence concerning developments on defence industries overseas. ITCan assists Canadians in partnering internationally in areas of research and development; attracting venture capital assisting Canadian business to develop foreign markets.

Department	Department Agency	Role
Agriculture and Agri-Food Canada (AAFC)		AAFC provides scientific expertise and advice regarding detection, measurement, evaluation or projection of CBRN-related material effects on crops, soils and livestock. AAFC also ensures appropriate measures are in place to contain or eliminate long term risks from those effects. AAFC works with provinces, territories and industry to develop systems to prevent or mitigate the impacts of CBRN incidents.
Canadian Food Inspection Agency (CFIA)		Under the *Emergency Preparedness Act*, the CFIA is mandated to prepare for, and respond to, emergencies involving food safety, animal health, plant health or any other situation related to the Agency's programs. The CFIA's emergency preparedness program focuses on activities that help the Agency and its partners reach a state of readiness to ensure an effective and rapid response to a food safety, animal disease or plant pest emergency. This is accomplished through the development of effective policies, procedures and plans for managing emergencies, as well as through emergency exercises and training. CFIA's import requirements and inspection programs are also designed to prevent a CBRN incident.
Natural Resources Canada (NRCan)		NRCan provides response capabilities for real-time aerial mapping of radioactivity dispersed accidentally or intentionally. This information is used by others to guide evacuation, sheltering, quarantine and decontamination. Under the *Comprehensive Test Ban Treaty (CTBT) Implementation Act*, and related policies, NRCan is responsible for the Canadian seismic, hydro-acoustic and infrasound components of the International Monitoring System for nuclear explosion detection.
Public Works and Government Services Canada (PWGSC)		PWGSC is responsible, under the authority of the *Defence Production Act*, for ensuring that CBRN related controlled goods and technologies are restricted to persons/companies registered with the Controlled Goods Program. This is done through the development of effective policies, procedures, compliance activities, and plans for managing emergencies and security breaches. PWGSC's inspection programs are also designed to prevent unauthorized access to CBRN related materials/technologies that are controlled goods. PWGSC also provides tools to prioritize federal buildings based on risk and vulnerability.
Privy Council Office (PCO)		PCO has overall responsibility for the coordination of emergency public communications during a CBRN incident.

Entity	Role
Provinces, Territories and Municipalities	Developing and maintaining appropriate CBRN preparedness and response programs as part of their primary, overall responsibility for managing the consequences of CBRN incidents. When requested or when the situation legally requires, the federal government will provide the appropriate response. Provinces, territories and municipalities will work with other levels of government to implement the objectives of the CBRN Strategy of the Government of Canada.
First Responder Services	Serve as the front-line in the crisis and consequence management to CBRN incidents, develop and implement appropriate preparedness and response programs, and capabilities to manage CBRN threats.
Private Industry, Academia and Non-Governmental Organizations	Contribute to the fulfillment of the CBRN Strategy of the Government of Canada objectives through the development of innovative products, technology, research and development, analysis and other supportive activities.

Table 2.2: Roles and Responsiblities of Entities

Source: The CBRN Strategy, Public Safety, 2005

Lastly, the 2005 CBRN Strategy clearly outlined the context, aim and objectives, but it also offered a clear strategic start point to implement a subsequent plan of action. It depicted that a plan started with the Assistant Deputy Minister (ADM) Public Safety Committee as the lead on strategic initiatives, while acknowledging that the combined and coordinated efforts of many levels of government, the private sector, and international partners were essential to see the strategy to fruition.[62] Although it appears

[62] Public Safety and Emergency Preparedness Canada, *The Chemical, Biological, Radiological and Nuclear Strategy …,* 10.

that an action plan did not come to fruition, the 2005 CBRN Strategy possessed the foundational strategic context, aim, and objectives in order to initiate the next step in the process of linking strategic guidance to effects on the ground.

The next iteration of a CBRN directive followed in January 2011 with an updated and modified version to the aforementioned document titled, *Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Resilience Strategy for Canada*. This document further demonstrated another clear appreciation for CBRNE preparedness, but tailored direction by building upon key strategic facets in: (1) Leadership, (2) Risk Management; (3) Capability-based Planning; (4) Effective and Interoperable Workforce; and (5) Information and Knowledge Management.[63] Its purpose was to convey a policy framework that spanned the four previously mentioned components of Prevention/Mitigation, Preparedness, Response and Recovery to develop a coherent action plan. The Strategy, as it was referred to, "recognized that taking preventative actions in advance to address CBRNE threats and risks will help prevent and mitigate the effects of CBRNE events."[64] Therefore, a complimentary document was created in 2011, the *Chemical, Biological, Radiological, Nuclear and Explosives Resilience Action Plan for Canada,* that reinforced the five strategic objectives from the Strategy as being the core to developing CBRNE resilience, which were listed as follows:

(1) Provide leadership for coordinated policy and program development;

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[63] Public Safety and Emergency Preparedness Canada, 2011 *Chemical, Biological, Radiological and Nuclear and Explosives Resilience Strategy* (Ottawa: Public Safety Canada, 2011), 1. PS_comp1 (bac-lac.gc.ca)

[64] Public Safety and Emergency Preparedness Canada, *"2011 Chemical, Biological, Radiological and Nuclear and Explosives Resilience Strategy and Action Plan*," (Ottawa: Public Safety Canada, 2011), last accessed 30 January 2022, Chemical, Biological, Radiological, Nuclear and Explosives Resilience Action Plan for Canada (publicsafety.gc.ca)

(2) Integrate CBRNE into an all-hazards risk management approach;
(3) Use capability-based planning to inform policy, program and investment decisions;
(4) Build an effective and interoperable workforce;
(5) Optimize information and knowledge management.[65]

The Action Plan directive also provides a comprehensive list of action items for each strategic objective noted above. In particular, it identifies specific tasks, corresponding deliverables for identified jurisdictions and timelines to achieve them. However, it is important to note the directed jurisdictions resided at the federal and provincial levels such as Public Safety Canada or Emergency Management Ontario, but did not refer to other government organizations such as Public Health Agency of Canada, Canada Border Services Agency, Transport Canada, Environment Canada, to name a few, like the previous document had identified and directed.

While the strategic context and purpose of the 2011 CBRNE Strategy remained the same as its predecessor document, it provided an addition of an organizational chart to delineate governing entities that could be involved in future CBRNE planning processes. This provided clarification on the diverse organizations and industries that would play a part in executing the overall strategy and action plan. The 2011 main document also provided additional guidance to achieve its outlined strategic objectives. This included additional guidance on factors such as optimizing information management, integrating CBRNE into an all-hazards risk management approach, building an effective and interoperable approach, using capability-based planning to inform policy, program and investment decisions, and how leadership would be provided from Public Safety to coordinate policy and future program development. However, this was the first iteration

[65] *Ibid*., 8.

of the strategy whereby the specific roles and responsibilities of government departments and other entities were omitted from the document. In fact, the document confirms that the previous depictions were deliberately removed from the main strategic directive as they are further indicated in the accompanying Action Plan document, "which forms the basis for resource allocation by respective organizations".[66]

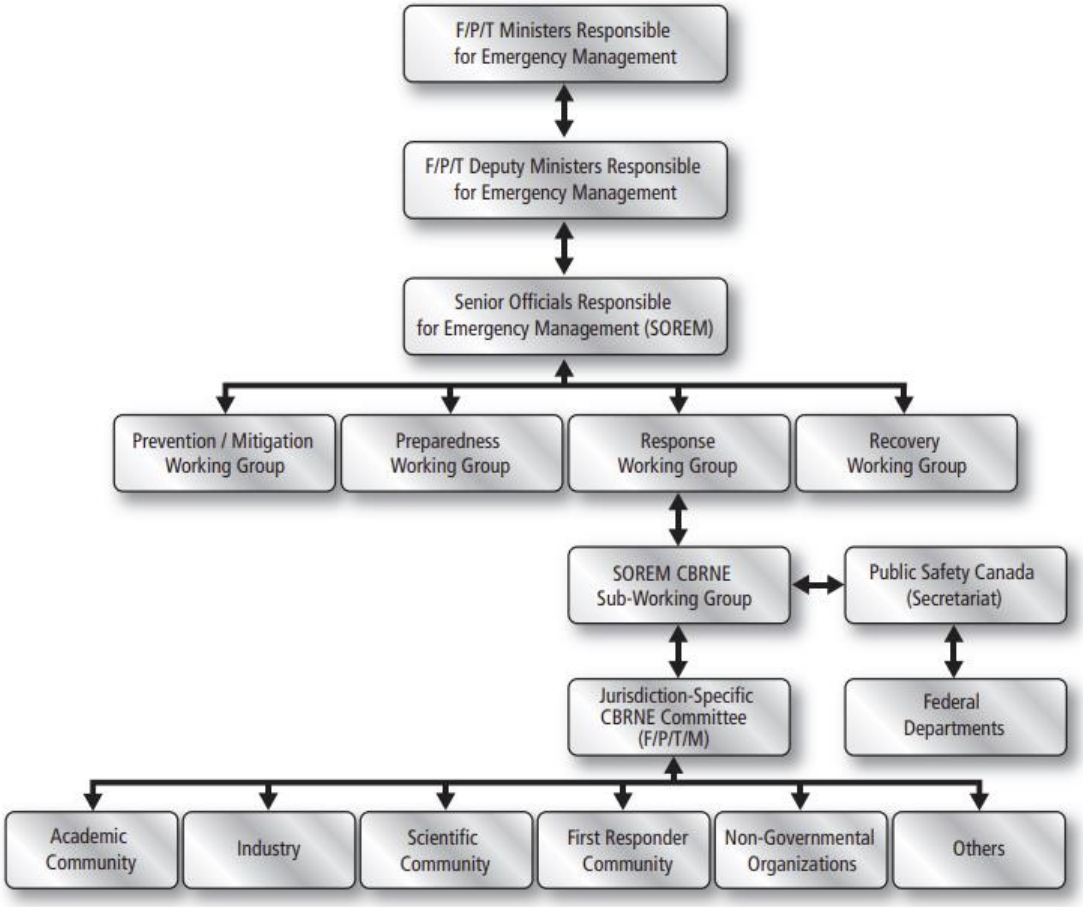

Figure 2.1: Governance of the Strategy and Action Plan

Source: CBRNE Resilience Strategy, Public Safety, 2011

The most recent version of the CBRNE strategic directive evolved to what we know today as the *Emergency Management Framework for Canada* in 2017. The Public

[66] Public Safety and Emergency Preparedness Canada, *"2011 Chemical…,* 10.

Safety Canada website references the *Emergency Management Act* of 2007 that "recognizes the roles of all stakeholders that play a part in Canada's emergency management system"[67] and identifies the leadership role and responsibilities of only the Minister of Public Safety. These include, but are not limited to, coordinating emergency management activities and a cursory, if not relatively generic, list of responsibilities of other federal ministers. Following the implementation of the Emergency Act, the previous CBRNE strategy was then amalgamated into what we know today as *An Emergency Management Framework of Canada* published in 2017 as the next strategic directive that was approved by all FPT Ministers. The revised framework outlines that most emergencies in Canada are managed by municipalities or communities more frequently, with provincial or territorial assistance available as required. It highlights that its intent is to "strengthen resilience to nature and human-induced hazards which requires contributions from all-of-society, coordinated by strong and effective leadership from FPT governments."[68] Subsequent to this, it also indicates that this framework is aligned with key international agreements to "advance disaster risk reduction… and Canada's domestic approach"[69] with four interdependent components, the same directed in the 2005 and 2011 strategies, which delineate the approach to achieve its objectives being: (1) Prevention and Mitigation; (2) Preparedness; (3) Response); and (4) Recovery.

The Framework further expounds on the principles of the emergency management philosophies and reiterates direction about the all-hazards approach that it adopted

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[67] Public Safety Canada, *Emergency Management* (Ottawa: Public Safety Canada, 2019), last accessed 15 December 2021, Emergency Management (publicsafety.gc.ca)

[68] Government of Canada, *An Emergency Management Frame for Canada - Third Edition.* (Ottawa: Public Safety Canada, 2017), last accessed 15 January 2022, https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/2017-mrgnc-mngmnt-frmwrk/2017-mrgnc-mngmnt-frmwrk-en.pdf

[69] *Ibid*., 5.

combined with how the federal government exercises its strategic leadership and responsibilities within certain jurisdictions. Additionally, it explains that the FPT governments are expected to work collectively but "within the jointly establish FPT emergency management governance structures, which facilitates coordination and collaboration in full respect of each government's legislated jurisdiction"[70] with the governance structure depicted below. It is noteworthy to mention that the directive identifies that the FPT governance structure as seen in Figure 8 can be stood-up or dismantled by Senior Officials Responsible for Emergency Management (SOREM) any time and is dependent on requirements. The SOREM may address priorities or establish working groups based on multi-sectoral perspectives that may include additional government partners from different departments. While there is an indication that the SOREM meets periodically, it is unclear in the directive how frequent these meetings occur throughout the year. In essence, it appears to be more of an ad hoc structure that is implemented when needed and seemingly a secondary duty when required to meet certain strategic objectives.

[70] *Ibid*., 14.

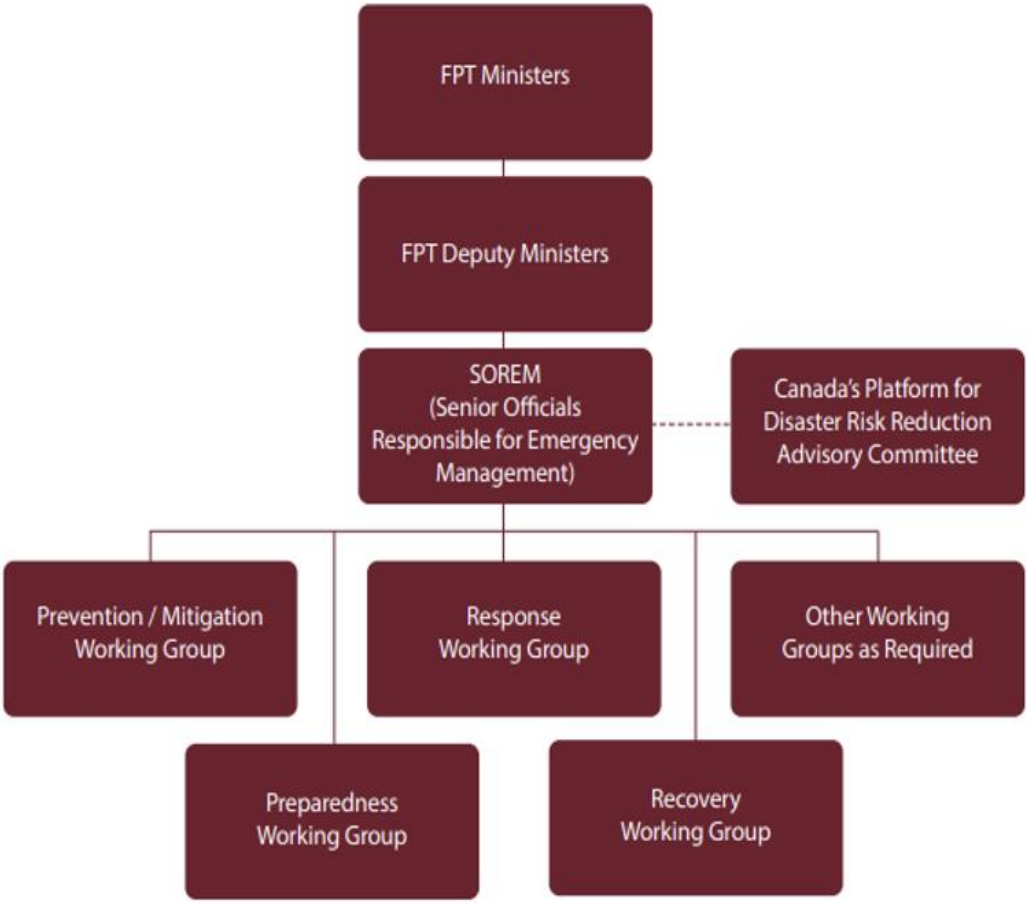

Figure 2.2: FPT Governance Structure

Source: An Emergency Management Framework for Canada, Public Safety, 2017

Lastly, the Framework denotes that among the important elements of the directive are the "Coordination Instruments" which are alluded to as the strategies, mechanisms and tools that are generated in order to support and enable the overarching directive objectives such as policy or guidance documents that afford better coordination at the national level.[71] The one resounding truth that the Framework refers to numerous times throughout its outline is that the field of emergency management continues to evolve and

[71] *Ibid*., 17.

that this "cornerstone document establishes a cohesive approach"[72] in how to roughly comprehend emergency management principles.

The next plan that is building on the existing Framework is the *Emergency Management Strategy for Canada: Toward a Resilient 2030*. This directive was published in 2019 as "a collaborative, whole-of society roadmap to strengthening Canada's ability to assess risks, prevent/mitigate, prepare for, respond to and recover from disasters"[73] in accordance with the Emergency Management government website. The context of this publication focuses mostly on natural disasters such as floods or wildfires as posing significant risks to communities, overall health, the economy and the natural environment. It further reinforces the five FPT Priority Areas of Activity that previously approved as responsible for emergency management in May 2017, which described a variety of approaches to align planning efforts, which are as follows:

(1) Enhance whole-of-society collaboration and government to strength resilience;
(2) Improve understanding of disaster risks in all sectors of society;
(3) Increase focus on whole-of-society disaster prevention and mitigation activities;
(4) Enhance disaster response capacity and coordination and for the development of new capabilities; and
(5) Strength recovery efforts by building back better to minimize the impacts of future disasters.[74]

These outlined Priority Areas of Activity endeavour to address the increasing complexity and rapidly evolving environmental risks that are projected, with a clear emphasis on collaboration and governance among FPT governments. While the strategy

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[72] *Ibid*., 18.
[73] Public Safety Canada, *Emergency Management* (Ottawa: Public Safety Canada, 2019), last accessed 15 December 2021, Emergency Management (publicsafety.gc.ca)
[74] Government of Canada, *Emergency Management Strategy for Canada: Toward a Resilient 2030* (Ottawa: Public Safety Canada, 2019), 9. mrgncy-mngmnt-strtgy-en.pdf (publicsafety.gc.ca)

reinforces an "all hazards approach" as its predecessor did beforehand, it neglects to mention any plan of action or proactive measures on how to respond to a potential CBRNE incident. However, a review of the Public Safety website does indicate that the 2011 CBRNE Resilience Strategy and Action Plan continues to be referenced as the integral policy framework intended to guide the creation of sustainable capabilities and common standards in CBRNE policies, programs, equipment, and training.[75]

While it is understood that Public Safety Canada is the lead agency on any CBRNE response, it is important to review how Other Government Departments (OGDs) also fit into the overall, integrated strategic analysis, planning and execution of a CBRNE incident. As such, the next section will provide a synopsis of the current preparedness and capabilities that these other organizations can offer from a capabilities, preparedness, roles and responsibilities perspective.

Other Departments

When reviewing the 2011 Action Plan directive, the tasks for coordinators to achieve certain strategic objectives predominantly falls to Provincial Emergency Management Organizations and Public Safety Canada. At first glance, this seemingly appears to be a logical take on guiding Government of Canada (GoC) federal and provincial levels into a coherent plan. However, it is remiss in including the incorporation of external agencies such as Canada Border Services Agency (CBSA), the Royal Canadian Mounted Police (RCMP), and Communication Security Establishment

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[75] Public Safety and Emergency Preparedness Canada, 2011 *Chemical, Biological, Radiological and Nuclear and Explosives Resilience Strategy and Action Plan* (Ottawa: Public Safety Canada, 2018), last accessed 30 January 2022. 2021, Chemical, Biological, Radiological and Nuclear and Explosives Resilience Strategy and Action Plan for Canada (publicsafety.gc.ca)

(CSE), to name a few that would provide significant support to respond to any CBRNE crisis. Although the Action Plan does indicate that "Coordinators must work collaboratively with, and be supported by, the other jurisdictions,"[76] it neglects to specify who those entities or organizations would be anywhere in the document. Moreover, key tasks such as CBRNE training and education or CBRNE tools, Equipment and technology to combat CBRNE are not allocated to any specific Coordinator. In fact, in the Action Plan there are numerous tasks that are not assigned to anyone, essentially left blank, and therefore the implication is that these are outstanding tasks within the Strategy that are not presently being administered, monitored, or executed as illustrated in the excerpt below in Figure 2.5.[77] It is also important to note that a more recent Action Plan has not been initiated or implemented to align with the 2017 and intended 2030 strategic documents.

[76] *Ibid*., 3.
[77] Public Safety and Emergency Preparedness Canada*, 2011 Chemical, Biological…,* 6.

Strategic Objective 4: Build an effective and interoperable workforce

Develop, resource, and sustain a specialized and interoperable workforce that is supported by a modern, dynamic and responsive training infrastructure and technologies, and a priority focus on safety.

Action Items	Tasks	Coordinators	Deliverables	Timelines
9. People Develop and deliver interoperable CBRNE training and education programs tailored to roles, responsibilities, and capability levels based on policies, recognized standards, and best practices	Define core competencies for CBRNE roles, responsibilities and capability levels		List of CBRNE competencies by role	Phase 2: 1-3 years
	Review current CBRNE training delivery and implement most efficient and effective delivery systems		Revised training system	Phase 2: 1-3 years
	Develop a mentoring and technical networking system		Mentoring and technical networking system	Phase 2: 1-3 years
	Establish and / or adopt a training curriculum and standards, and investigate certification, based on capability levels and equipment		Revised training; Common training standards	Phase 3: 3-5 years
	Develop or confirm a training review cycle		Training review cycle	Phase 3: 3-5 years
10. Tools, Equipment and Technology Promote the acquisition, use, and maintenance of interoperable equipment and tools, including recommended new technologies	Establish and / or adopt recognized standards for tools, equipment and technologies		Equipment standards	Phase 3: 3-5 years
	Develop a process to systematically renew tools, equipment and technologies based on capability levels		Renewal procedures linked to capability levels	Phase 3: 3-5 years
	Examine the role and capacity / function of laboratories during CBRNE events		Report with action plan	Phase 3: 3-5 years
11. Procedures Develop and use consistent and interoperable procedures and plans	Develop and adopt common CBRNE terminology to be used within a national incident management system / incident command system	Centre for Security Science / Public Safety Canada	Common lexicon created and shared through virtual centre of expertise	Phase 1: 12 months
	Establish procedures that support standardized competencies for CBRNE roles and responsibilities		Procedures by competency	Phase 2: 1-3 years
	Develop a toolkit to establish a common base for planning		Toolkit developed and shared through virtual centre of expertise	Phase 2: 1-3 years
	Promote the adoption of a national incident management system / incident command system		Jurisdiction-specific incident command system	Phase 3: 3-5 years
	Conduct regular, multi-disciplinary and inter-jurisdictional exercises based on accepted principles of exercise design	Public Safety Canada	CBRNE exercises	Phase 1: 12 months
	Provide a forum for contributing to and sharing lessons learned and best practices		Forum for lessons learned and best practices	Phase 2: 1-3 years

Table 2.3: Excerpt from CBRNE Resilience Action Plan, Strategic Objective 4

Source: Public Safety Canada, January 2011

Global Affairs Canada

A review of Global Affairs Canada (GAC) direction regarding CBRNE weapons and materials provides a perfunctory description that the department "is dedicated to ensuring Canadians and citizens everywhere are able to live in clean communities that

contribute to their health and well-being."[78] It specifically notes that one of its Federal Sustainable Development Strategy (FSDS) goals is to provide safe and healthy communities, therein remarking that CBRN weapons and materials can directly impact both the human health and global environment dimensions in Canada.[79] While the aforementioned FSDS sets out the GoC's environmental sustainability priorities in managing potential CBRNE situations, with a view to establish goals, targets, and actions in order to achieve identified benchmarks, the document does identify that all of the 13 FSDS goals are only aspirational and with a long-term vision to achieve clear action plans.[80] Unfortunately, while there is a brief mention of CBRNE concerns to achieve FSDS goals of a safe and healthy community, there is no further depiction in the FSDS nor a comprehensive explanation of additional CBRNE initiatives or potential action plans that would assure Canada's safety through proactive measures.

The website further references that through the GAC *Weapons of Mass Destruction Threat Reduction Program*, the department "aims to reduce this risk by undertaking projects in priority regions of the globe to detect, secure and destroy vulnerable CBRN materials and strengthen the global response to CBRNE threats."[81] This is reinforced by GAC continuing to work with partners such as the International Atomic Energy Agency and the *Global Partnership Against the Spread of Weapons and Material of Mass Destruction*. Further research to the associated GAC website for the

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[78] Global Affairs Canada, *2017-2020 Departmental Sustainable Development Strategy*, last accessed 3 February 2022, Strategic Environmental Assessment: Departmental Sustainable Development Strategy 2017-2020 (international.gc.ca)

[79] *Ibid*.

[80] Global Affairs Canada, *The Federal Sustainable Development Strategy*, last accessed 3 February 2022, The Federal Sustainable Development Strategy (fsds-sfdd.ca)

[81] *Ibid*.

Non-proliferation, arms control and disarmament efforts boasts that Canada has contributed more than $1.6 billion since 2002 towards this program,[82] thereby supporting international efforts to help countries reduce their nuclear and missile programs and to ensure international adherence to the reduction program. This link also provides insight into other initiatives that GoC participates in such as the Conference on Disarmament, the Disarmament Commission, and the First Committee of the UN General Assembly with cursory descriptions of these programs and how Canada's participation has influenced greater global awareness, actions towards advance non-proliferation and disarmament priorities.[83] However, it is difficult to navigate the successful achievements in the prevention of actual CBRNE threats or attacks and what GAC's proactive action plans would be in order to deal with a catastrophic CBRNE event.

Public Health Agency of Canada

The Public Health Agency of Canada (PHAC), an organization that "focuses on preventing disease and injuries, responding to public health threats, promoting good physical and mental health, and providing information to support informed decision making"[84] provides another cursory explanation of how this federal department is involved in a potential CBRNE disaster. In the event of a CBRNE incident, PHAC stipulates that it is "responsible for supporting emergency health and social services in the provinces and territories"[85] and outlines where to find additional information on Radiological, Nuclear, or Chemical Emergencies. These sources then link the

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[82] Government of Canada, "*Non-proliferation, arms control, and disarmament efforts*", last accessed 3 February 2022, Non-proliferation, arms control, and disarmament efforts (international.gc.ca)

[83] *Ibid*., 2.

[84] Government of Canada, *Public Health Agency of Canada*, last accessed 3 February 2022, Public Health Agency of Canada - Canada.ca

[85] Government of Canada, Public Health Agency of Canada, *Emergency Response – Radiological or Nuclear Emergency*, last accessed 3 February 2022, Emergency Response - Canada.ca

government's emergency response activities through the Federal Nuclear Emergency Plan (FNEP) and the Chemical Emergency Preparedness and Response Unit (CEPRU) respectively. While the FNEP does provide some context for how support to a CBRNE event would be arranged (i.e. support to provincial/territorial or Public Safety activities), specifics for arrangements are "covered in the Federal CBRNE Plan,"[86] which the FNEP also points out having been under development since 2012. Figure 2.3 below provides a perspective of how the emergency response plan and international arrangements were depicted for clarification in the FNEP.[87]

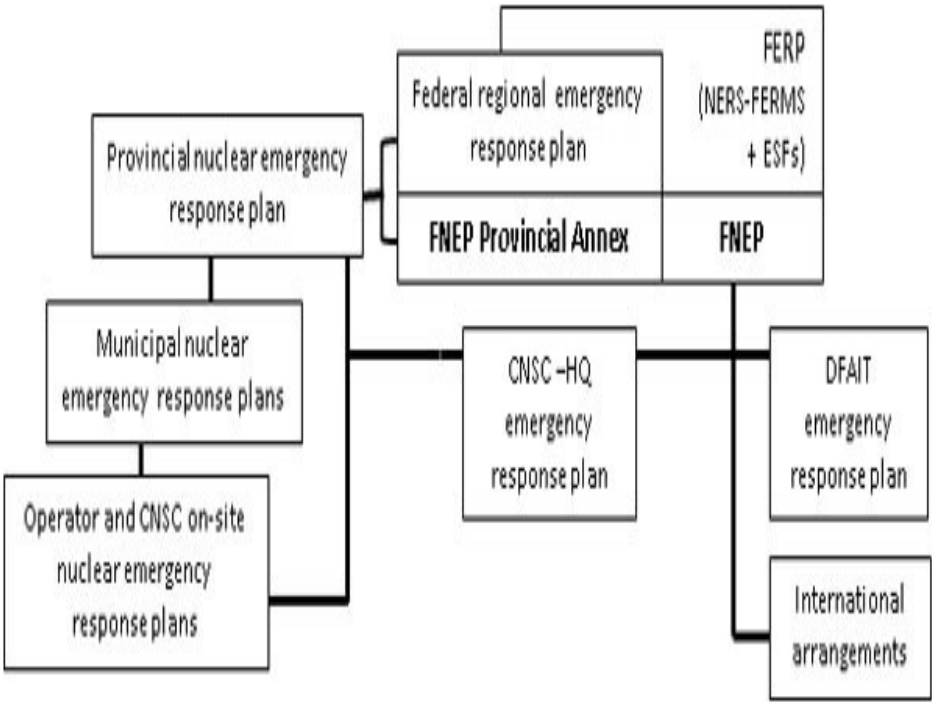

Figure 2.3: Planning relationships for Nuclear Emergencies or Threats to North America

Source: Federal Nuclear Emergency Plan, 2014

[86] Government of Canada, Public Health Agency of Canada, *Federal Nuclear Emergency Plan Part 1: Master Plan,* last accessed 4 February 2022, Federal Nuclear Emergency Plan Part 1: Master Plan - Canada.ca

[87] *Ibid.*

A more in-depth investigation to uncover the Federal CBRNE Plan does not yield any further links or files to this draft document, nor an indication as to what strategic plan replaced this endeavor. However, the FNEP does present a similar Regional/National Emergency Response Management System that does align with the Emergency Management Framework for Canada seen in Figure 2.4. Here, the National Emergency Response System (NERS) will be augmented by FNEP officials and task teams to provide on-site response or advice to GoC.[88] The FNEP actually states that Health Canada, in concert with FNEP partners, is expected to maintain a list of departmental representatives "who may be called upon to staff positions"[89] in a relative impromptu fashion if an emergency situation were to occur.

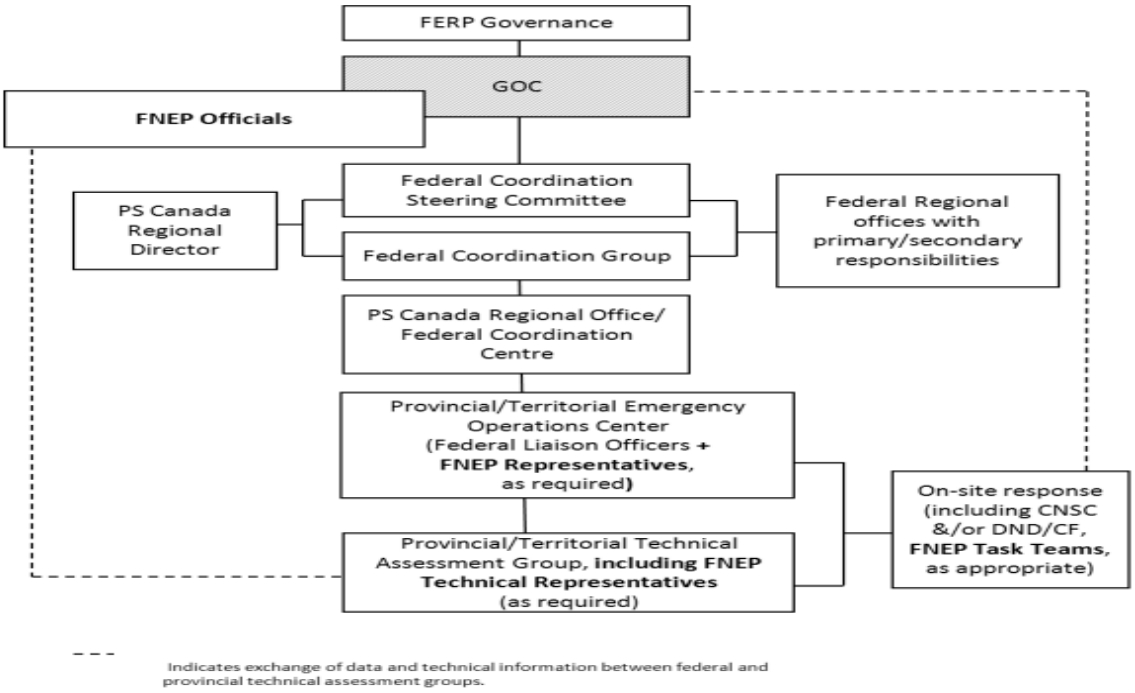

Figure 2.4: Federal Emergency Response Plan

Source: Federal Nuclear Emergency Plan, 2014

[88] *Ibid*., 18.
[89] *Ibid*., 19.

The Royal Canadian Mounted Police

The Royal Canadian Mounted Police (RCMP) does reference that a CBRNE Response Team, which falls under their Forensic Identification Services section, can be called in to evaluate scenes potentially linked to terrorist or suspected terrorist activities. It also highlights that the CBRNE Team can be deployed to provide immediate, on-site analysis of suspicious packages, attacks or unexpected incidents and, if requested, they can provide assistance to police agencies following a CBRNE event.[90] However, there is indication that this response team is relatively small and with limited capacity except to manage identification of CBRNE evidence, collect samples, and likely to provide expert advice. Otherwise, the RCMP website does not provide any further indication of assistance or involvement in managing a CBRNE incident.

Other Government Organizations/Federal Departments

Other federal organizations such as CBSA, CSE, Agriculture and Agri-Food Canada (AAFC), Canadian Food Inspection Agency (CFIA), to name a few, that were previously indicated in the GoC's 2005 CBRN Strategy do not provide any indication that their departments would be incorporated into a potential CBRNE response. Any slight reference to CBRNE on their public websites generally refers the reader back to the *Emergency Management Framework of Canada* under the purview of Public Safety, thereby insinuating minimal to absolute no involvement in this type of situation.

[90] Royal Canadian Mounted Police, *Forensic Identification Services - Chemical, Biological, Radiological, Nuclear, Explosives*, last accessed 5 February 2022, Chemical, Biological, Radiological, Nuclear Explosives (rcmp-grc.gc.ca)

Department of National Defence

The strategic context and objectives of Canada's defence mandates are outlined in the 2017 *Strong, Secure, and Engaged (SSE)* policy. This document stipulates that "it offers clear direction on Canadian defence priorities over a 20-year horizon"[93] with a focus on rebuilding core military capabilities, supporting operational initiatives and fostering existing alliances and partnerships, both nationally and internationally. This strategic document goes on further to illustrate key defence financial projections and long-term funding commitments that would further strengthen the Canadian Armed Forces (CAF) with the proper "equipment required to achieve excellence across the full spectrum of military operations from humanitarian assistance and disaster relief, to peacekeeping, to combat."[94] Interestingly, the direction pertaining to the potential defence or response to a CBRNE incident is only indicated once in the document. It mentions specifically that the CAF "will be prepared to respond to requests from the government and to assist other government departments and law enforcement agencies in support of Canadian national security"[95] which also includes counter-terrorism. In essence, the CAF's principal involvement in the event of a CBRNE attack is seemingly supportive in nature to other Canadian federal, provincial, and municipal departments as required and if necessary.

It is important to note that the *Emergency Management Framework of Canada* does not specify how the Department of National Defence (DND) would be incorporated into a CBRNE response. However, this does not negate the preparations that DND have

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[93] Government of Canada, *Strong, Secure, Engaged: Canada's Defence Policy* (Ottawa: DND Canada, 2017), 11.
[94] *Ibid*., 11.
[95] *Ibid*., 86.

made to ensure proper assistance that may be provided in the event of a CBRNE incident. Unique to DND, it also has specific units that provide specialist advice while others can provide adequate decontamination capabilities. Furthermore, DND's strategic level guidance is clearly outlined in their Defence Administrative Orders and Directives (DAODs) 8006 series which summarizes the department's "framework to establish an effective CBRN Force Protection capability outlined in the Canada First Defence Strategy, and the basis for the development of future CBRN capabilities and contingency plans."[96] As well, additional strategic doctrinal publications have also been issued such as the Canadian Forces Joint Publication (CFJP) 3-8 and 3-8.1 and numerous, internal CBRN directives to provide guidance that include topics such as the CBRNE Operating Concept, CBRNE Defence Tactics, Techniques and Procedures, CBRNE Aide-Memoires, and CBRNE Equipment.[97]

DND also has issued publications that offer direction on tactics or operational procedures in diverse settings such as urban areas. Moreover, the Canadian Joint Incident Response Unit (CJIRU), an integral component of the Canadian Forces Special Operations Command (CANSOFCOM) has the specific task to provide "a rapid CBRN response for special operation missions."[98] Their unit specializes "first and foremost in detecting, identifying and mitigating CBRN risks"[99] and therefore would likely work closely in cooperation with the RCMP and PHAC during CBRN operations. This also

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[96] Department of National Defence, Defence Administrative Orders and Directives (DAODs), *Chemical, Biological, Radiological and Nuclear Defence 8006-0*, last accessed 5 February 2022, DAOD 8006-0, Chemical, Biological, Radiological and Nuclear Defence - Canada.ca

[97] Department of National Defense, B-GL-005-380/FP-001, CFJP 3-8 and 3-8.1, Chemical, Biological, Radiological, and Nuclear Defence (Ottawa: DND Ottawa, Intranet source, 2012).

[98] Department of National Defence, *Canadian Joint Incident Response Unit (CJIRU)*, last accessed 7 February 2022, Canadian Joint Incident Response Unit - Canada.ca

[99] *Ibid*.

insinuates that CJIRU predominantly is a deployable sense unit to assess, identify and evaluate CBRNE situations, much like the RCMP CBRNE Response Team, but with limited CBRNE response capacity.

However, in terms of response capabilities, the Canadian Army provides comparatively the most robust CBRNE support capability to reinforce any response callout. It maintains a CBRN decontamination system which is directed to "provide a joint capability for the decontamination of personnel equipment, vehicles, ships, infrastructure and non-sensitive personal equipment"[100] and is composed of three decontamination lines of effort. The system can decontaminate up to 20 people and 4 light armored vehicles per hour and operate in temperatures ranging from -19 degrees Celsius to 49 degrees Celsius.[101] Furthermore, the system includes personnel decontamination modules comprised of heated showers and the ability to decontaminate personal equipment such as weapons and masks, but also the vehicle decontamination module that can decontaminate land combat and support vehicles, aircraft, building exteriors and paved surfaces. It is also important to note the task of managing these systems has generally been given to the three Regular Force Service Battalions across Canada which have been directed to maintain a Decontamination (DECON) Platoon within their Supply Companies. This task combined with managing the CBRN suits, gas masks, gloves, and boots affords the Canadian Forces the most likely robust system available within Canada to provide a moderate level of support to a CBRNE event.[102]

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[100] Department of National Defence, *Chief of Force Development - Decontamination System, July 2016* (Ottawa: DND Ottawa, Intranet source, 2021).

[101] *Ibid*.

[102] *Ibid*.

Provincial and Municipal CBRNE Preparedness

A revisit to the *Emergency Management Framework* references that most imminent emergencies in Canada are handled by municipalities or communities where the incident occurs. In terms of CBRNE, the first line of defence for the public in these type of incidents remains the local firefighters and as such they generally provide Hazardous Materials (HAZMAT) Teams to respond to any situation that poses a hazard to people, property or the environment. Since each Fire Department is run independently from Provincial or Federal oversight, their HAZMAT response teams can be organized differently, with varying degrees of response capabilities, technical equipment or expertise available. Some departments will also have specific Fire Stations that have directed HAZMAT response teams with specialty trucks and equipment available such as mobile decontamination units. For example, the City of Edmonton Fire Department possesses only one Fire Station (F.S. #10) that holds these specialty trucks and equipment for the entirety of the City of Edmonton region.[103] Conversely, the City of Ottawa, which has produced a comprehensive and collective CBRNE Task Force Response Plan, has delineated that the Ottawa Fire Department provides the "HAZMAT/CBRNE Team" with key roles identified between the Fire Chief, Office of Emergency Management, City Management, Chief of Police, Paramedic Services, to name a few.[104] However, it is unclear as to how many specialized teams are ready to deploy in Ottawa in case of a CBRNE incident.

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[103] City of Edmonton. Fire Rescue Operations. *Specialty Response Teams – Hazardous Materials Team*, last accessed 10 February 2022, Fire Rescue Operations | City of Edmonton

[104] City of Ottawa. *Chemical, Biological, Radiological, Nuclear, & Explosive Task Force Response Plan*, last accessed 10 February 2022, City of Ottawa

In 2007, *Firefighting in Canada*, an editorial magazine which provides a forum for fire and related emergency service leaders to share news and developments in the industry, surveyed the provinces of Manitoba, New Brunswick and Ontario to assess their regional HAZMAT response team's capabilities. In the review, it identified that many departments have at least one CBRN response team with varying levels of training qualifications supporting their respective municipalities. However, the provinces each managed their involvement or assistance to these teams in differing ways. For example, in Ontario, the Emergency Management Office (EMO) provides significant oversight and supports the operational costs associated with established and approved CBRN teams, whereas Manitoba's Office of the Fire Commissioner takes the lead role in establishing better capabilities, formalized training, and direct oversight.[105] While New Brunswick at the time of the survey still was "in the process to establish five teams… to deal with HAZMAT incidents."[106] Finally, it is important to note that while HAZMAT teams are more prepared to deal with industrial type chemical or biological incidents, the management of actual CBRNE responses would still require military intervention and assistance as they lack much of the required decontamination support in order to provide immediate aid.

The observations to take away from the sampling references of different Fire Departments and across Provinces supports that the action plans vary greatly across Canada. While many Fire Departments and Municipalities have theoretically established HAZMAT or CBRNE teams, there still exists divergences in the mandates that are set out

[105] Andrew A. Sanojca, "Developing regional hazmat teams: Examining what three provinces have in place for hazardous materials incidents," *Firefighting in Canada*, 7 December 2007, last accessed 10 February 2022, Developing regional haz-mat teams - Fire Fighting in Canada

[106] *Ibid*.

to be achieved among varying provincial government levels. Ultimately, it remains that provincial and municipal levels administer different expectations, programs, and mandates under their respective provincial emergency management services.

International Partnerships

In the often referenced 2011 CBRNE Resilience Strategy, it indicates that Canada "must invest in its relationship with international partners in order to facilitate the exchange of information and intelligence, enable mutual assistance and scientific cooperation, and counter proliferation of CBRNE materials."[107] Accordingly, Canada participates in a number of international organizations such as the Quadrilateral Group on CBRNE Counter-Terrorism, the Global Health Security Initiative (GHSI), the Global Partnership Against the Spread of Weapons and Material of Mass Destruction – a Group of Eight (G8) initiative, as well as other bilateral and multi-lateral partnerships to ensure Canada's national security and global stability.[108] Interestingly, the *Global Partnership Against the Spread of Weapons and Materials of Mass Destruction* website provides a comprehensive narrative of the organization describing its mandate, principles and guidelines and a more thorough review of its priorities with specific mention of Biological Security, Chemical Security, Nuclear Security and CBRN Security.[109] The Global Partnership website further states that its mandate is "to prevent terrorists and those that harbor them from acquiring weapons and materials of mass destruction"[110] and

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[107] Public Safety and Emergency Preparedness Canada, *"2011 Chemical…*, 11.

[108] *Ibid*., 2.

[109] Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, *Global Partnership Priorities*, last accessed 3 February 2022, About (gpwmd.com)

[110] Government of Canada, *Canada and the World – The Global Partnership and Canada's Weapons Threat Reduction Program*, last accessed 3 February 2022, Non-proliferation, arms control, and disarmament efforts (international.gc.ca)

that they have achieved impressive results that "eliminated or mitigated a wide range of serious threats."[111] This organization further notes that of the 31 active members, or countries, it "continues to implement a diverse range of programming activities around the world in four priority areas, which are to Strengthen Nuclear and Radiological Security, Mitigate Biological Threats, Chemical Weapons Destruction and Security, and Support UNSCR 1540."[112] It also depicts a prolific list of the International Organizations the Global Partnership collectively works with to moderate or reduce the threat of CBRN activities throughout the world. Some of these include the International Atomic Energy Agency (IAEA), the Nuclear Security Summit (NSS), the Organization for the Prohibition of Chemical Weapons (OPCW), the United Nations Office of Counter-Terrorism (UNOCT), or the European Union Risk Mitigation Centers of Excellence Initiative.[113]

While Canada provides representation at these CBRNE global councils or organizations, in addition to financial support, it remains unclear as to what level of involvement, preparation and planning that it provides in terms of international support, what can be provided to Canada as international assistance and what Canada in return can provide to support other international partners.

Summary

It is without a doubt that the existing CBRNE national strategies and basic action plans have evolved over the past two decades to what stands now as the Emergency Management Framework in Canada. However, the confounding gap between these

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[111] *Ibid*.
[112] *Ibid*.
[113] *Ibid*.

policies and their ability to be actioned appropriately reinforce that the space between policy and planning needs to be more carefully evaluated and practically cultivated. Moreover, the strategic context and objectives that have been identified in existing GoC directives clearly demonstrate that Public Safety Canada remains the overseer for national leadership and support in the event of a CBRNE incident. Although the first line of defence for the public in this type of scenario remains the local fire fighters, it is apparent that the level of CBRNE capacity that they hold would need to be significantly augmented or reinforced by other provincial or federal sources. In this case, DND and its military resources with more dedicated assets geared specifically towards large-scale CBRNE situations, such as decontamination modules and additional CBRN personnel equipment such as suits and masks would be required in order to effectively respond to any CBRN incident. Accordingly, this chapter has identified that Canada's current national defence policies are not sufficiently aligned among intragovernmental and FPT entities to ensure that a seamless and timely response would be likely.

The next chapter will evaluate the strengths and limitations of Canada's current strategic action plans as it pertains specifically to CBRNE. It will endeavour to assess the linkages between Canada's national policies to its response capabilities. Inevitably, it will endeavour to ascertain how prepared Canada is ready to respond to a large-scale CBRNE incident, especially taking into account the future dynamic changes to warfare that are anticipated in the near future.

CHAPTER THREE
STRENGTHS AND LIMITATIONS OF CANADA'S NATIONAL CBRNE STRATEGY AND ACTION PLANS

Introduction – The Need for Coherent National Strategies

The future of warfare and its foreseeable, and likely unavoidable, changes requires that national and governmental policies provide an adequate, overarching vision with actionable plans that can be seen to fruition by operational or tactical entities. Inevitably, strategic directives must create value, elucidate core strategic concepts, and provide specific viable targets if they are to be effectively executed at the lowest levels. In order to achieve the aforementioned, Don Argus and Danny Samson argue that effective leaders and their subsequent departments need "to 'paint a picture' for the whole of the organization that they are responsible for."[114] More specifically, the "vision and strategy needs to be set in every context, authorized for implementation, and communicated to all stakeholders in a manner that will motivate them."[115] Without the fundamentals to establish a baseline strategy, and without significantly taking into account certain leadership characteristics, the strategic implementation of a national action plan will not achieve successful benchmarks nor its intended objective end states.

Furthermore, without first assessing the problem, digesting and scrutinizing information, and then conducting an adequate analysis in how to manage a high-level strategy, the likelihood that the plan can be executed well and aligned with the direction is virtually non-existent. By extension, this then impedes the next step in developing effective strategies to manage a situation if the plan is unattainable due to poor

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[114] Don Argus and Danny Samson, *Strategic Leadership for Business Value Creation: Principles and Case Studies* (Singapore: Springer Singapore Pte Ltd, 2021), 7. 10.1007/978-981-15-9430-4.pdf (springer.com)

[115] *Ibid*, 8.

collaboration and execution standards. Thus, any refinement of that plan becomes negligible and the organization may be back to the drawing table to ascertain and develop another viable, strategic plan.

This chapter will examine what the current strengths and limitations are of Canada's current CBRNE strategy and action plan through the most recently developed Emergency Management framework. In particular, it will look to relay how organizational strategies should provide clarity to define its purpose, goals and the means in how to achieve them, especially when considering such a critical, volatile and significant subject such as CBRNE. Specifically, the study will reveal the nuances of the national response structure to a CBRNE incident, what the capabilities of providing adequate medical and life-saving measures to the civilian population are projected to be, and what level or scale of attack that Canada's CBRNE strategic action plans may be able to manage or support. Finally, this chapter will also look to provide insight and analyze Canada's current strategic emergency management action plan through its linkages to national directives and its stakeholders that would ultimately hold the responsibility to manage a CBRNE incident if it so occurred.

Developing a National Strategic Directive

A review of strategic organizational literature offers numerous recommendations on how to frame a strategic problem set. Often, collaboration with stakeholders and governmental departments are key to catalyzing action to manage a situation, specific incident, or challenge. Many sources will annotate different tools or analytical approaches to assist in developing a strategy, such as the usage of SWOT (Strengths, Weaknesses, Opportunities, Threats) analyses, competitor analyses or financial

modelling, and so on.[116] These tools then collectively provide the basis to deliberate and assess what the broad, conceptual and future-oriented problem set may be. While many strategic organizational sources are written towards successful approaches to business strategies, the concepts and basis for developing and implementing a cascade of initiatives and creating value should remain extant for any industry, even at national, provincial and municipal governmental levels.

An article in the *Harvard Business Review* identifies that in order to initiate development of a successful strategy, it is important to develop a set of answers to five-interlinked questions. These questions include:

(1) What are our broad **aspirations** for our organization **and** the concrete **goals** against which we can measure our progress?
(2) Across the potential field available to us, **where** will we choose **to play** and not play?
(3) In our chosen place to play, **how** will we choose **to win** against the competitors there?
(4) What **capabilities** are necessary **to build** and maintain to win in our chosen manner?
(5) What **management systems** are necessary **to operate** to build and maintain the key capabilities?[117]

The answers to the aforementioned questions then, theoretically, should offer a set of responses which would drive the aspirational goals to be achieved, with an intended end state or ultimate objective that would support the strategic mission or vision. Realistically, what should ideally happen throughout the creation of strategic directives becomes an iterative process that develops the plan with aspirations and goals in mind, then considers the what and how, then goes back to a review the aspirations and goals to

[116] Roger L. Martin, "Five Questions to Build a Strategy," *Harvard Business Review*, 26 May 2010, last accessed 2 Mar 22, Five Questions to Build a Strategy (hbr.org); Note – the bold words are in the original document to highlight the key components to the interlinked questions

[117] *Ibid*., 1.

determine if modifications are necessary before proceeding to the next step in determining capabilities and management systems. However, the folly of many organizations often start strategic analysis at the top of the hierarchy and look to determine a strategy from a focal top-down vision or mission statement, which can create a whirlwind of circular discussions with no one really committing or agreeing to anything that would result in an effective strategy.[118]

Another source indicates that organizations developing strategies "need to set the correct directions, focus on core capabilities and implement with vigor, while carefully managing risk."[119] As such, a solid strategy can then guide decisions in formulating a strategy perspective and determining key elements to enacting the plan via a set of strategic initiatives. In this respect, high-level group Mission, Vision and Objectives are seen as the pillars to achieve success,[120] but without lower level collaboration to understand these aspects with expected behaviours to be achieved through performance benchmarks and confirmation of capacity to support, the strategy will pragmatically become unsuccessful. In essence, "the organization must consider and align the elements of structure, processes and people…the decisions to be made by the right individuals and teams…to accomplish the strategic goals"[121] Thus, without a road map to the future, the outcome of the organization's ability to create value will not be achieved. In essence, "Failing to plan is planning to fail!"[122] This, of course, implies that just creating a strategic action plan is insufficient to ensuring the solid execution of that plan.

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[118] *Ibid*., 2.
[119] Don Argus and Danny Samson, *Strategic Leadership for Business Value Creation*…, ix.
[120] *Ibid*., 54.
[121] *Ibid*., 56.
[122] *Ibid*., 56.

This all sounds relatively straightforward, comprehensive and even practical in terms of expectations and likely execution of the task. However, what is often seen in many failed strategies is that the gap between the organizational strategy and the actionable targets or duties are significantly either misunderstood, not explicitly realized, or completely disregarded as being paramount to the execution of the overarching strategy. Even Henry Mintzberg, a renowned Canadian academic on business and management strategy, denotes that "the grand fallacy of 'strategic planning' should have been called 'strategic programming' and promoted as a process to formalize the consequences of strategies."[123] Nevertheless, even today, organizations and governmental departments still struggle with these concepts and seeing the effective implementation of a strategy to realization. Hence, these issues or concerns are generally not really appreciated until the time comes, often too late, to see that the strategic plan would not meet the intent nor achieve its intended objective outcomes. Unfortunately, when it comes to the impact to human lives and collateral damage, the results are more often than not catastrophic and only really understood in retrospection. In the case of Canada's current approach to CBRNE, it is more than likely that this strategy would foreseeably encounter the same failures.

A Review of Canada's CBRNE Policy and Strategy Outcomes

A historical examination at Canada's inability to see national policy and strategy to fruition has been experienced time and again. Notable examples have been observed in Canada's mission to Afghanistan, under then Prime Minister Stephen Harper, which

[123] Henry Mintzberg, "Rethinking Strategic Planning Part I: Pitfalls and Fallacies," *Long Range Planning* Vol. 27, No. 3, 1994, (Elsevier Science Ltd, Great Britain): 19. PII: 0024-6301(94)90185-6 (mintzberg.org)

ultimately neglected to achieve the expected mission outcome after years of investment and commitment. Another noteworthy example was Paul Martin's commitment to defend human security in Darfur which was never delivered. Even Jean Chrétien's government promised the scaling back of military commitments in the 1990s, only to see the CAF's operational tempo increase at the same time of a 30% decrease to military funding popularized as the "decade of darkness" by General Rick Hillier.[124]

Surprisingly, the trend is not an unexpected or unfamiliar one in Canada when it comes to national policy or defence strategy failures. In some respects, one may even contend that Canadian national strategies, especially from a defence perspective, often fail to result in the expected outcomes. One source offers six interrelated explanations, which affect Canada's ability to achieve successful strategic outcomes:

(1) Canadians don't typically develop policy and strategy through a rational process;
(2) Defence policy outcomes are often expendable because they are rarely linked directly to Ottawa's grander strategic goals;
(3) Canadian governments have habitually refused to accept the cost and the level of commitment necessary to achieve policy aims;
(4) The CAF's traditional military culture, characterized by an unwillingness to admit failure, interferes with rational analyses of the relative success of defence policy initiatives;
(5) Canadian defence policy is regularly operationalized in an alliance context; and
(6) Measuring defence policy outcomes is difficult in the best of times.[125]

Therefore, taking the aforementioned into consideration, it soon becomes clear that Canada's CBRNE strategy may have fallen victim to the same interdependent and

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[124] Douglas Dempster, "Capability Acquisition and Canadian Defence Policy: Programme Achievability and Resilience?" in *Canadian Defence Policy in Theory and Practice* (Ottawa: Palgrave Macmillan, 2020), 335.

[125] Adam Chapnick and J. Craig Stone, "From Policy and Strategy to Outcomes", in *Canadian Defence Policy in Theory and Practice* (Ottawa: Palgrave Macmillan, 2020): 82-83. 471558_1_En_Print.indd (springer.com)

causal effects that continue to plague Canada's ability of seeing its national strategic policies and directives from being attained. In order to assess the efficacy of Canada's CBRNE strategy, it is imperative to look at whether the strategy "purposely links policy aims [or ends] to competitive ways, with sustainable means" and "following a risk assessment that takes into consideration feasibility, political acceptability and suitability."[126]

As mentioned in the previous Chapter, the 2017 Emergency Management Framework of Canada presents a comprehensive, all-inclusive approach to managing a wide array of emergency situations ranging from environmental disasters to human-induced cataclysms.[127] While this document provides the perfunctory outlined purpose of the strategic framework, with generated principles providing the essence of the emergency management plan, it glosses over the governance mechanisms and coordination instruments that would be required to manage a national-level threat or incident response. Moreover, although the strategic directive references human-induced hazards, such as terrorist attacks, it is only mentioned once throughout the document and thus the conception of CBRNE is actually not fully implied or described. Further review of the government website that publishes CBRNE direction also notes that while the 2017 Emergency Management Framework is the most recent strategic directive to adhere to, the older versions of the 2011 and 2005 CBRNE strategies remain extant. In particular, the 2011 strategy as being the token CBRNE referenced strategic manual as the most

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[126] *Ibid*., 83-84.

[127] Government of Canada, *An Emergency Management Frame for Canada - Third Edition.* 2017. Public Safety Canada, last accessed 15 January 2022, https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/2017-mrgnc-mngmnt-frmwrk/2017-mrgnc-mngmnt-frmwrk-en.pdf

applicable directive.[128] Unfortunately, what is provided only further creates confusion and potential misdirection for guidance as to what the actual CBRNE action plan is in Canada.

Nonetheless, the still accessible 2005 CBRN Strategy, published shortly after the events of 9/11, offers the most concise strategic framework outline, minus an actual action plan on how to see the strategy to realization. The document, which expounds on specifics regarding CBRN strategic aims, concepts, roles and responsibilities, in addition to what coordination efforts should be achieved, illustrates the most complete and inclusive version of the reason for a CBRNE strategy with tangible strategic objectives and required collaborative efforts.[129] However, any further depiction of specific assigned tasks with objective outcomes, tasks that should be completed or timeline parameters to be monitored or achieved appears to be completely overlooked.

The next iteration with the 2011 CBRNE strategy further exacts additional direction regarding more explicit key strategic objectives. It also offers an accompanying governance structure and CBRNE Resilience Action Plan. Although the Action Plan is explicitly referenced numerous times throughout the document, it is not attached as an annex to the main strategic directive for ease for the reader to access. What follows for an interested reader is a barrage of information on numerous Canada's governmental websites that eventually leads to the CBRNE Resilience Action Plan. At first glance, the researcher will note a relatively comprehensive and delineated plan to achieve specific

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[128] Public Safety and Emergency Preparedness Canada, *2005 The Chemical, Biological, Radiological* …, 3**;** Public Safety and Emergency Preparedness Canada, 2011 C*hemical, Biological, Radiological …*; Government of Canada. *An Emergency Management Frame for Canada - Third Edition.* 2017. Public Safety Canada, last accessed 15 January 2022.

[129] Public Safety and Emergency Preparedness Canada*, 2005 The Chemical, Biological, Radiological* …, 3. rslnc-strtg-rchvd-eng.pdf (publicsafety.gc.ca)

strategic CBRNE objectives. However, as mentioned in the previous chapter, the accompanying Action Plan with identifiable action items, tasks, with specific coordinators, deliverables and timelines appears to be incomplete.[130] What is presented is a number of empty columns that it is not fully clear as to whether the named entity in the column above it implies it is responsible for the remaining unassigned column of associated, but different tasks. Further investigation spurred no evidence or confirmation on outlined timelines to achieve specific benchmarks noted in the Action Plan. Therefore, while the document at first glance seems to be appropriate for developing subsequent steps to support the national strategic directive, it fails to complete a number of the five interrelated questions to develop an effective strategy mentioned previously in this chapter.[131] As such, the Action Plan appears to be an underdeveloped and relatively illogical strategic plan, does not appear to be linked to Ottawa's grander strategic goals, and the cost analyses to see the strategy to fruition does not appear to have been taken into account nor revisited even years later. Nonetheless, one could postulate that the document is really just a mirage of incomplete information that has not been taken seriously in some respects, especially from a national oversight and quality control perspective.

Hence, what unfolds when further research is conducted on how Canada and Public Safety would respond to a CBRNE incident, offers a perplexing rabbit hole and deluge of documentation to numerous websites, links to other directives and multiple sources in order to extract some form of detailed action plan if a CBRNE incident were to

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[130] Public Safety and Emergency Preparedness Canada, *2011 Chemical, Biological,...*,Chemical, Biological, Radiological, Nuclear and Explosives Resilience Action Plan for Canada (publicsafety.gc.ca)

[131] *Ibid*.

occur. While it is important to remain objective when attempting to unravel an understanding of a national strategic policy, it is also imperative that such an important document regarding a potential event of such magnitude that would impact Canada's people at such a significant and national level, should be relatively simple to navigate and uncover.

Canada's CBRNE National Response Structure

In the 2011 CBRNE Resilience Strategy iteration, the Governance of the Strategy and Action Plan, as noted in Chapter 2 Tables 2.1 and 2.2, provided a relatively generic depiction of the relationship between various governmental entities. While it would be difficult to ascertain specific names to the organizational chart, especially when taking into consideration the diverse tiers of Emergency Management from the FPT ministries responsible for Emergency Management, it remains that even positional naming conventions would do better than what was provided. To determine the generic "Academic Community," "Industry," "Scientific Community," although affording a broad perspective, creates a high level of ambiguity and non-confidence in the ability to quickly mobilize the overarching Governance team if a catastrophic event were to occur.[132] Still, as we have revealed in the previous section, the first responders to a CBRNE threat would more than likely be the municipal firefighters of the jurisdiction were the incident would take place. Thus, depending on the level of response and immediate detection of a CBRNE event and combined with the level of communication to identify to the national level of further imminent threats, there is feasible room for the activation of the Governance team to have a bit of time to collectively gather. The crux

[132] *Ibid*., 7.

of the issue is that there is no indication or document that details the timeframe that it would take to pull together this team to handle a catastrophic CBRNE event in a timely and ultimately effective manner.

In the book *Good Strategy, Bad Strategy,* Richard P. Rumelt suggests that "having a coherent strategy – one that coordinates policies and actions"[133] is an essential component to developing a practicable plan that is understood, galvanized and put into action easily. However, one could contend that having a governance structure that is unclear as to who the parties or points of contact should be in the event that it is called upon in an emergency situation, may not be a completely coherent structure. Moreover, if the governance structure is only called upon in light of an emergency and fails to meet periodically, or as a minimum annually, the chances that it would be appropriately reactive in an suitable timeframe would be miniscule at best. Simply put, a strategy is only as good as the implementation of its plan in a timely manner.

Canada's Medical Preparedness in the Event of a CBRNE Emergency

Bioterrorism comprises "a large spectrum of concerns, from catastrophic terrorism with mass casualties to micro-events using low technology but producing civil unrest, disruption, disease, disabilities, and death."[134] It is important to not forget that in the case of a catastrophic CBRNE incident, the response to react to the situation is just the tip of the iceberg, figuratively speaking. In fact, the next step after an initial response is that of the emergency medical care that must be provided to those affected by such a situation.

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[133] Richard P. Rumelt, *Good Strategy, Bad Strategy: The Difference and Why it Matters*. 1st ed. (New York: Crown Business, 2011), 34.

[134] Erenler, Ali Kemal, Murat Güzel, and Ahmet Baydin, "How Prepared are we for Possible Bioterrorist Attacks: An Approach from Emergency Medicine Perspective," *The Scientific World* (2018): 1. How Prepared Are We for Possible Bioterrorist Attacks: An Approach from Emergency Medicine Perspective - ProQuest

Here, the crux of the matter surrounds whether or not the medical capacity in hospitals and primary care institutions would be able to provide adequate, life-saving medical care to those most affected. Erenler et al. state that "as first responders, a well-trained staff, efficient data systems, and sufficient laboratory capacity in the emergency department are the essentials for an appropriate response."[135]

As a comparative example, the 1995 Tokyo sarin subway attack affected over 5,000 people of which 12 were direct casualties that died, 40 were heavily injured, more than 900 moderately affected and many more that were considered slightly injured. In addition to these numbers, another 300 members of the rescue teams which included firefighters, police officers, and emergency medical personnel were also injured from the direct effects of the sarin gas attack. Many of these secondary victims were "caused by insufficient knowledge, training, and technical capabilities to cope with a threat posed by the use of chemical weapons."[136]

Moreover, recent experiences during the coronavirus-19 (COVID-19) pandemic offer just another example of the level of pressure and constraints that Canada's medical system would be able to provide in the event of a CBRNE crises. More often than not, the capacity of the hospitals in extreme situations is far less than the ability to provide adequate, life-saving support – a fact which profoundly resonated in Canada during the COVID-19 crisis. The impact of COVID-19 illustrated the tenuous abilities of Canada's medical system that were under continuous strain beyond normal expectations. In fact, one of the many reasons why the provinces went into numerous lockdowns across Canada

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[135] *Ibid*., 1

[136] Dusan Vicar and Radim Vicar, "CBRN Terrorism…, 22.

were due to the fact that the medical system was stressed to its maximum capacity and that in order to alleviate the burdens on the medical system. Here, it was paramount to try and moderate the virus by managing decreased contact due to its high virulence. This was particularly noted "when health authorities across the country concentrated their pandemic readiness efforts on maximizing the capacity of hospitals to treat those who fell critically ill."[137] Although conversely they had to cancel other non-emergency surgeries (including for cancer, cardiac, and other serious illnesses), diagnostic testing, clinical trials and palliative care were suspended"[138] in order to counteract the demands of COVID-19. Moreover, the Organization for Economic Co-operation and Development (OECD) recently ranked "Canada as fourth last in terms of intensive care beds available per capital (only Chile, Sweden and Colombia ranked lower)…Canada had just 1.97 ICU beds for every 1,000 residents."[139] These statistics only further reinforce that the medical system could feasibly be unprepared to handle another crisis as was evidenced by the pandemic pressures that were experienced throughout the past two years in Canada. A significant CBRNE event would more than likely create additional fissures and pressures upon an already strained medical force given the level of preparedness that our medical system already demonstrated.

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[137] Katherine Fierlbeck, Lorian Hardcastle, Aimée Craft, et al. *Vulnerable: The Law, Policy and Ethics of COVID-19*, edited by Flood, Colleen M., Vanessa MacDonnell, Sophie Thériault, Sridhar Venkatapuram and Jane Philpott (Ottawa, CA: University of Ottawa Press/Les Presses de l'Université d'Ottawa, 2020), 340-341. Read - Vulnerable : The Law, Policy and Ethics of COVID-19 - desLibris (oclc.org)

[138] *Ibid*., 341.

[139] Tristin Hopper, "Why Canada's hospital capacity was so easily overwhelmed by the COVID pandemic," *National Post*, 17 January 2022, 1, last accessed 14 March 2022, Why Canada's hospital capacity was so easily overwhelmed by the COVID pandemic | National Post

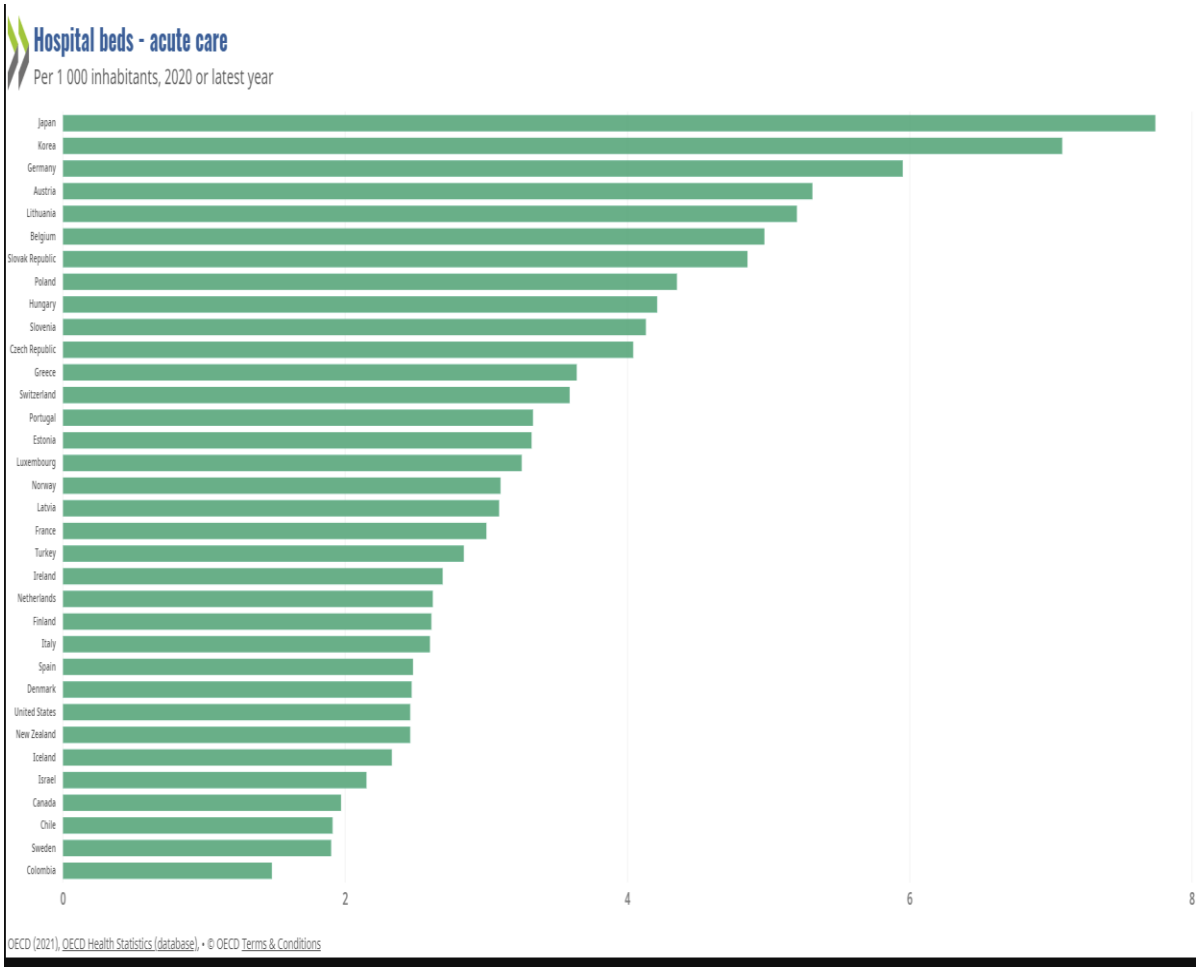

Figure 3.1: Hospital beds – acute care per 1,000 inhabitants

Source: OECD, 2020

Another study conducted in Canada in 2003 following the 9/11 terror attacks evaluated the risks and characteristics of CBRNE types of events and looked to ascertain the preparedness of Canadian emergency departments ability to respond. The results indicated that many hospitals throughout Canada "needed to revise their disaster readiness plans, with CBRN events in mind"[140] and the data suggested a significant lack

[140] Daniel Kollek, "Canadian Emergency Department Preparedness for a Nuclear, Biological or Chemical Event," *Canadian Journal of Emergency Medicine* 5, no. 1 (2003): 25. Canadian emergency department preparedness for a nuclear, biological or chemical event - ProQuest

of preparedness specifically with "a lack of tested disaster plans and decontamination facilities that could handle large numbers of patients."[141] Most poignant from this study was that the emergency departments (EDs) and their respective medical chiefs acknowledged that of the 95% EDs that were queried that had developed a disaster plan, only 47% had reviewed it in the past year and only 18% had actually conducted a disaster exercise in the previous 12 months.[142]

More recently, other studies regarding bioterrorism and CBRNE preparedness indicate a rather dismal, but practical truth, to how society and the medical world may be able to handle such an event. In one reference, the authors refer to category A agents "that are the greatest risk to national security"[143] predominantly because of its pathogenic origins closely linked to naturally occurring biological sources. Oftentimes, the initial diagnosis inflicted by biological agents from a malevolent aggressor are not avidly recognized in time, but may still cause a high mortality rate in the midst of a mass casualty response. According to one survey of the 1,603 physicians consulted on their level of preparation for CBRNE, the results found that "only one-third of respondents reported feeling comfortable about their ability to manage public health emergencies such as bioterrorist attacks and only one-half had participated in emergency training in the previous two years."[144] These factors, as well as understanding that mass casualty and disaster management are not routinely included in medical school or residency portions of medical training, only further buttresses the level of preparedness that Canadian medical

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[141] *Ibid*., 25.
[142] *Ibid*., 19.
[143] Nicholas A. Rathjen and S. David Shahbodaghi, "Bioterrorism," *American Family Physician* 104, no. 4 (1 October 2021): 376. Bioterrorism - ProQuest
[144] *Ibid*., 382.

institutions are ready to provide in the event of a CBRNE incident. This does not discount their ability to provide life-saving medical support, but it cannot be disregarded that Canada's medical and primary care institutions are more than likely to not be ready to manage a large-scale CBRNE event if it did occur.

Scale of CBRNE Support and Management

In order to properly prepare for an ostensibly disastrous event, one that directly impacts first responders, medical and primary care professionals, and the citizens in the surrounding area, one must be able to ascertain some level of estimate of what could be supported. While we can surmise a roundabout approximation of how many casualties any one entity could provide assistance to, it is extremely difficult to determine the scale of CBRNE support and management that would be feasible and under extreme circumstances. As discussed in the previous section, we know that Canada is one of the lowest ranking nations that possesses insufficient numbers of hospital beds for acute conditions in comparison to many other developed liberal democracies. In truth, it is a system that has consistently been overwhelmed easily even prior to the pandemic.[145]

Moreover, as discussed in the previous chapter, while it is understood that there are many entities involved in the overall emergency management and detection of CBRNE events, the actual initial response falls to the first responders from the municipal fire departments, and if detected early enough can be reinforced by military CBRNE decontamination units. Yet, as mentioned previously, the military's capacity is rather limited as well. If the deployable system can only accommodate up to 20 people and four light armoured vehicles in an hour, and this is if it is set up in sufficient time to properly

[145] Tristin Hopper, "Why Canada's hospital capacity…, 2.

counteract the initial CBRNE effects, the actual ability to provide adequate support is rather limited in Canada. More importantly, any reaction to a CBRNE event would not be immediate and would therefore be reactionary at best. This, of course, is extremely concerning especially given recent events which indicated that Russia's President Vladimir Putin "is using his nuclear arsenal in a way because it is a tool he has, one that is mysterious and utterly terrifying"[146] when he threatened NATO and Western democracies to not get involved in the conflict and war against Ukraine. While Russia is just one country that possesses nuclear warheads and the capacity to inflict catastrophic CBRNE destruction, it cannot be forgotten that many countries throughout the world are estimated to continue to stockpile these weapons (see Appendices 3 and 4). Nonetheless, projections for a nuclear war still remain relatively low even as tensions continue throughout Europe and Eurasia today.

Canada's CBRNE Strategic Links to National Directives and Policy

A look back at the last few decades, recognizes that Ottawa has published five defence White Papers (including the most recent in 2017), all of them professing to project defence and security challenges well into the future. Many of them also provided long term agendas or plans for the outlook of Canada's military. Yet, each of these "four defence policy statements had a shelf life of no more than a few years, before they were overtaken by events or succumbed to forces beyond their control"[147] such as structural deficits (i.e. a disparity noted between revenues and expenditures).

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[146] Thomas O'Falk, "How realistic is Vladimir Putin's nuclear threat," *Aljazeera*, 3 March 2022, last accessed 15 March 2022, How realistic is Vladimir Putin's nuclear threat? | Russia-Ukraine war News | Al Jazeera

[147] Eugene Lang, "The Shelf Life of Defence White Papers." *Policy Options*, 23 June 2017, last accessed 28 April 2022, 2. The shelf life of defence White Papers (irpp.org)

To provide further context, in 2006, the Department of National Defence had issued the *Canada First Defence Strategy*, which provided context and a long-term plan for the future of the CAF. Not only was the proposed increased defence spending greeted with ambivalence in government, but an analysis by the Conference of Defence Associations, a lobby group, "showed that even with the infusion of cash, capital spending appeared to be inadequate and that defence spending as a percentage of gross domestic product was projected to decline over the next twenty years."[148] Ironically, by the time the *Canada First Defence* strategic document was published, the CAF had already been operating in Afghanistan for five years. In essence, "the CAF were therefore operating in Afghanistan without a clear understanding of Ottawa's policy goals for at least two years"[149] and "despite a healthy economy, a "pro-defence" government, a sizable commitment in Afghanistan, and a level of public support for the CF unprecedented in recent times."[150]

The next iteration which followed in 2017 with *Strong, Secure, Engaged* further provided the government's direction on "an ambitious 20-year agenda for the Canadian Armed Forces…committing to a robust capital equipment program…more than $60 billion in new money promised over the next two decades to fund the policy."[151] Unfortunately, this document still misses clarity in terms of a grander or more strategic vision for Canada. It still remains ambiguous as to exactly what Canada's defence and foreign policies presently are and ultimately leaves the reader, and by extension, the

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[148] Robert Michael Hartfiel, "Planning without Guidance: Canadian Defence Policy and Planning, 1993-2004." *Canadian Public Administration* 53, no. 3 (2010): 341. Planning without guidance: Canadian defence policy and planning, 1993–2004 - Hartfiel - 2010 - Canadian Public Administration - Wiley Online Library (oclc.org)

[149] Adam Chapnick and J. Craig Stone, "From Policy…., 84.

[150] Robert Michael Hartfiel, "Planning without Guidance…, 342.

[151] Eugene Lang, "The Shelf Life…, 1.

organization to deduce lines of effort or a broader strategy. Surprisingly, around the same time that the Liberal government was voted into government in 2015, a number of other federal organizations and departments also experienced reviews and updated strategic directives. Other departments, such as Public Safety Canada and Global Affairs Canada, also received updated policies, but experienced the same situation as the CAF in that "there is little evidence that these processes were interlinked sufficiently to result in a whole-of-government vision of Canada's global posture."[152]

Although these are just a few examples in Canada's strategic national policy framework development efforts, it reinforces that one of the primary issues that exist in national policy making and action plan progress is that they are rarely, if not often, isolated from the bigger vision for Canada. This is especially true from the onset of initial policy development coordination in Canada. Consequently, the linkages between national policy creation, planning, and then execution appear to be particularly misaligned which provides context into why much of Canada's responses to situations are generally reactionary vice proactive.[153]

Nevertheless, it is important to note though that this issue has consistently been observed over many decades and is not a result of any one particular government. In fact, it seems to be more of an organizational culture approach in Canada that directly affects all departments and organizations in one way or another. As an example, the national security and intelligence advisor (NSIA) is a public servant position in the Privy Council Office (PCO). The NSIA is set to provide advice to the prime minister on security and

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[152] Adam Chapnick and J. Craig Stone, "From Policy…., 85.

[153] David S. McDonough, "Introduction," in *Canada's National Security in the Post-9/11 World* (Toronto: University of Toronto Press, 2012), 7.

intelligence matters, coordinating efforts among members of the security and intelligence community, providing information, advice and recommendations on strategic policy matters, just to name a few.[154]

Interestingly, the NSIA is advantageously well-positioned to provide medium-to-long term strategic national security policy advice and direction, especially given the office's visibility and most "up-to-date awareness of crossing-cutting national security issues facing Canada."[155] Unfortunately, this position is relegated by its ability to function in coordinating or gathering key players to develop effective national strategies because the "NSIA lacks any formal authority and is unable to provide direction to departments and agencies beyond relaying the view of the clerk of the Privy Council, the prime minister or his office (PMO)."[156] In fact, there is no legislation or federal mandate that governs the NSIA role or PCO, which consequently severely inhibits national security policy and decision-making as these authorities are generally held by federal ministers and deputy ministers. In effect, the NSIA is in a position that lacks any significant authority to ensure collaboration in the development of national security policies. This factor may be one of the issues that greatly hinders Canada's development of providing any effective, realistic and actionable national strategic directives or polices. Accordingly, what is often perceived as a continuous cycle of cross-sectional, stove

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[154] Privy Council Office, *Speech by the National Security and Intelligence Advisory to the Prime Minister*, 8 June 2021, last accessed 4 March 2022, Speech by the National Security and Intelligence Advisor to the Prime Minister to the Centre for International Governance Innovation - Privy Council Office - Canada.ca - Canada.ca

[155] Navid Hassibi, "Canada needs a better national security policy: Enhancing the role of the national security and intelligence advisor for briefings and advice to the PMO would result in a coherent defence strategy," *Policy Options*, 15 March 2021, last accessed 5 March 2022, Canada needs a better national security policy (irpp.org)

[156] *Ibid*., 1.

piping initiatives attempting to drive national policies to actualization, is never really achieved in attaining the benchmarks or goals set out before them.

Summary

In order to remain objective in examining Canada's CBRNE strategy, it is important to understand that it is entirely possible that a more well-informed, developed CBRNE Action Plan and Strategy could very well be classified documentation that is not readily accessible to the general public nor to curious researchers. While this fact may true, there is sufficient evidence in terms of medical system constraints and moderate CBRNE decontamination capabilities, at both the civilian and military level, that give credence that the level of response that Canada would be able to provide to its citizens in the event of a CBRNE incident would be minimal at best. In a world where recent tensions have promulgated greater concern about the world's ability to respond and react to heinous actions by malevolent actors, and taking into account how warfare continues to evolve, it is incumbent on the country's government to ensure that their strategic directives and action plans can be seen to fruition successfully.

Further, it is imperative that they are comprehensive, rational, factual, and ultimately realistic to those parties at the lowest operational levels that would be involved in managing a high intensity situation where tensions and outcomes could be so devastating to a country. Otherwise, the plan and strategies emplaced would likely be no better than the flimsy paper that they may have been derived on. Accordingly, the next chapter will look to address how Canada may be able to resolve the limitations of its current national CBRNE strategies. This combined with leveraging key personnel within their federal government to oversee the implementation of these plans will assure a more proactive approach and readiness to respond to a CBRNE incident.

CHAPTER FOUR
IS CANADA READY?

He who fails to plan is planning to fail.

- Winston Churchill, 20th Century

Introduction

The tenets of war intrinsically remain the same; however, the truth about warfare reinforces one noteworthy constant throughout history – that of change. It is naïve to expect that the fundamental mechanism of defence preparedness will always remain extant or impenetrable. In truth, the military and industrial revolutions only confirm that the pace of technological change eclipses the ability of many nations to develop effective national defence strategies to counteract them. However, this does not negate the ability of defence institutions to develop proactive defence or response systems to safeguard one's country and its citizens. Nowhere is this more true than with Canada's national strategic approach to its CBRNE emergency management response plan. Despite lessons learned and the considerable efforts that its national strategists had put forth into early CBRNE action plans following 9/11, the CBRNE response plan has virtually dissipated into an all-hazards approach concentration. Unfortunately, this line of thinking underrates the consequences of a CBRNE incident and diminishes the efficacy of an appropriate response plan.

Chapter 1 analyzed the nature of warfare and its ever-evolving progression in terms of tactics and approaches to conflict. It identified how the much-anticipated and imminent Fourth Industrial Revolution will bring forth impressive, new technological developments that will undoubtedly affect the nature of warfare and future defence considerations. Chapter 2 delved into Canada's perceived strategic intent of its national

defence strategies, with a clear focus on CBRNE security and defence preparations. It also distinguished the multitude of inter-governmental and municipal agencies that would be involved in responding to a CBRNE incident if it were to occur. Chapter 2 further ascertained what CBRNE defence capabilities Canadian agencies are equipped to offer and outlined the preparedness levels of each involved and responsive organization. Chapter 3 provided insight into how prepared Canada is able to react and support a CBRNE event by analyzing its strengths and limitations of its current strategic emergency management action plans. It additionally explored Canada's ability to provide adequate leadership direction and patent CBRNE support in the event a response is warranted. However, it is important to note that there still exists a gap between national strategic policy and how to see an action plan to fruition, which will be the focus of this next portion of the study.

This next and final chapter will identify some of the observations noted in this study and propose how Canada is in dire need of a grand strategy. Ideally, this grand strategy would "encompass the foreign policy role that the country would like to play and an assessment of its capability to play that role… incorporate a notion of the threats that a country faced historically and the risks it is likely to confront in the future."[157] It will also suggest that Canada's federal government could leverage key positions that currently exist within their departments to bolster Canada's CBRNE approach to provide more direct leadership oversight and assure better guidance if a response is required. Although these potential solutions are directed at CBRNE preparedness, they are broadly applicable

[157] Charles F. Doran and David Pratt, "The Need for a Canadian Grand Strategy," in *Canada's National Security in the Post-9/11 World* (Toronto: University of Toronto Press, 2019), 25-44. ProQuest Ebook Central - Canada's National Security in the Post 9-11 World

to a number of strategic action plans. Examples such as Canada's overarching national security strategy, which has not been renewed since 2004,[158] or the sorely needed cyber foreign policy[159] are just some examples of national defence strategies that often suffer the same lack of consideration to ensure appropriate planning and readiness levels. The challenges that have been observed recently with the Russian-Ukraine war have only reinforced that Canada's national security defence institutions are insufficiently prepared to effectively enact its strategic action plans, especially as it pertains to CBRNE. Accordingly, it is imperative that Canada assesses what they can do now to ensure that they can act decisively if and when the time comes.

The Necessity for a Grand Strategy

The requirement for a Canadian national grand strategy is not a novel proposal, unfortunately. It has been discussed and recommended for many years, but yet still, the Canadian governments for decades, both liberal and conservative, have never promulgated or even drafted a grand strategy for consideration. Leuprecht and Sokolsky comment that "those charged with formulating Canada's defense policy have consistently, except in times of war and pressing international crisis, concluded that the country's vital national interests and a modicum of global influence do not correlate with profligate spending."[160] This impression is only further bolstered by the most recent federal budget announcement by Finance Minister Chrystia Freeland that "set aside $8

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[158] Navid Hassibi, "Canada needs a better national security policy…, 2.

[159] Christopher Parsons, "When and how is the CSE disrupting international cybercrime?" *Policy Options*, 3 March 2022, last accessed 10 April 2022, When and how is the CSE disrupting international cybercrime? (irpp.org)

[160] Christian Leuprecht and Joel J. Sokolsky, "Defense Policy 'Walmart Style': Canadian Lessons in 'Not-So-Grand' Grand Strategy," *Armed Forces & Society* 41, no. 3 (2014): 542. Defense Policy "Walmart Style" (oclc.org)

billion over five years for defence…with Canada's military spending set to double between 2016 and 2026, led by a new $6-billion contribution to the CAF last week."[161] Freeland cited the war in Ukraine and Canada's responsibility to NATO allies as the premise for the mindset change stating that "recent events require the government to reassess Canada's role, priorities, and needs in the face of a changing world"[162] in light of the invasion of Ukraine as "a war for the entire democratic world."[163] Consequently, given these most recent global events, Canada's government is once again on the precipice of reassessing the importance of defence needs and priorities while simultaneously reliving past practices.

The paradoxical truth of how Canada continues to oversimplify the need for astute, practical strategic policies or actions plans only further confirms that its national stance is one for a preference of reaction rather than preemptive. One could further postulate the many other reasons for why the government has always appeared to be reticent to pursue a proactive agenda, but history and past behaviours support that, providing further supposition really has not led anywhere towards the materialization of a Canadian grand strategy. Despite this, it is easy to ascertain and inexorably declare that Canada's lack of national security focus has only encumbered its ability to properly prepare for both domestic and international threats. Canada's "free riding" and "just enough" grand strategy stance only hinders proper planning and future preparedness, which leaves the nation shuffling to catch up when something does occur.[164] The mantra

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[161] Marisa Coulton, "Important for Canada to react': Finance Minister Chrystia Freeland defends increased defence spending," *Financial Post*, 12 April 2022, last accessed 12 April 2022, 'Important for Canada to react': Finance Minister Chrystia Freeland defends increased defence spending (msn.com)

[162] *Ibid*., 1.

[163] *Ibid*., 1.

[164] Christian Leuprecht and Joel J. Sokolsky, "Defense Policy 'Walmart Style': Canadian Lessons…, 549-557.

to showing up to the party with minimal contribution is not one that should be sustained any longer as the outcome could feasibly have devastating effects. Nowhere is this more true and evident than what has been uncovered by a thorough assessment of Canada's current CBRNE strategies and action plans.

It is unfortunate, but not completely surprising, that the GoC's CBRNE strategies and action plans offer convoluted and, in some respects, untenable objectives. While the documents, in theory, provide context and an overarching vision, the nebulous operational effects and action plans are not thoroughly understood at several levels nor are they effectively practiced by the entities that would be involved in a CBRNE event. A national grand strategy is just one step in the right direction which lies in federal and foreign policy that "will protect its nation's interests and allow one to assess trends and prepare for contingencies… into a coherent frame work for policy initiatives."[165] Without this, the nation will continue to stovepipe policies and action plans that will not survive first contact from a malevolent enemy.

The Way Ahead for National CBRNE Defence Strategies

This study has inferred that it is imperative that Canada look to move forward from a defensive and minimalist culture to more of a countermeasure or proactive approach.[166] This key factor is one of the most inhibitive elements to Canada's overarching strategic guidelines and initiatives. Munier suggests that "offensive preferences refer to an inevitable vision of war, where the best option is to act before the

[165] Charles F. Doran and David Pratt, "The Need for a Canadian Grand Strategy…, 31.

[166] Marco Munier, "The Canadian National Intelligence Culture: A Minimalist and Defensive National Intelligence Apparatus," *International Journal (Toronto) 76*, no. 3 (2021): 429. The Canadian national intelligence culture: A minimalist and defensive national intelligence apparatus (sagepub.com)

other acts."[167] This course of action thereby implies that the Canadian national intelligence culture would need to anticipate what the offensives lines of action would entail, more than just the existing observant entities they are.

In order to properly prepare Canada and to ensure an adequate level of capability to defend against threats, regardless of the type of adversary, it requires a more thorough review of tangible threats versus perceived existential threats. Don Macnamara remarks that it is not surprising that the four main national interests of Canada almost perfectly align with Canada's threat perception. They are: (1) security to the protection of Canadian territory and its people, (2) prosperity to promote economic growth and support Canadian's overall welfare, (3) stabilizing international order in the interests of security and prosperity; and (4) the projection of values to enhance democracy, freedom and human rights.[168] Given these aforementioned national interests, Munier suggests that "Canada does not seem to perceive any existential threats to the survival of the state…the nature of the threats are more limited, related to physical security and economic security…driven by internationalist identity and national interests."[169] Consequently, Canada has traditionally not examined the actual physical threats with a keen, scrutinizing eye and thus has historically not put in adequate effort into defensive action plans. Even a recent annual report in 2018 into the National Security and Intelligence Committee of Parliamentarians (NSCIOP) acknowledged that "intelligence does not play a direct role and is not used as an offensive tool for government, but is used to monitor and advise."[170]

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[167] *Ibid*., 432.

[168] Don Macnamara, "Canada's National and International Security Interests," in David S. McDonough, ed., *Canada's National Security in the Post-9/11 World: Strategy, Interests, and Threats* (Toronto: University of Toronto Press, 2019), 45-56.

[169] Marco Munier, "The Canadian…, 437.

[170] Marco Munier, "The Canadian…, 440.

It is without a doubt that a reform in defence strategic development would need to occur, accompanied with viable action plans, to assure improvements especially as it pertains to CBRNE defensive support and effective response capacity.

A second approach to improving Canada's national defence strategies would be to empower certain political and government positions that are already in place, such as the highly influential position of the National Security Intelligence Advisor (NSIA). As discussed in the previous chapter, the Canadian government chooses not to employ or pursue proactive measures even within their own departments. The NSIA is a key position in the Canadian national intelligence community that is best situated to oversee the implementation and performance capabilities of all national defence strategic action plans. This study offers that the NSIA is a position that, if given the proper authorities to coordinate and provide direction to national defence departments and agencies, would be best placed to bring national security policies together into a coherent integrated strategy. Not only would the position be a centrally, politically well-positioned point of contract, but the NSIA could feasibly also ensure proper checks and balances to confirm strategic action plans viability, which does not appear to currently exist.[171]

The benefits to vitalizing a federal government position such as NSIA, which also happens to be a key stakeholder in the Canadian intelligence sphere, is just another step in the right direction that would reinforce Canada's commitment to national security and defence. By happenstance, the current NSIA Jody Thomas was previously the Deputy Minister to the Department of National Defence.[172] Intrinsically, it is not difficult to

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[171] Navid Hassibi, "Canada needs a better national security policy…, 2.

[172] Government of Canada, "The Prime Minister announces changes in the senior ranks of the Public Service," *Prime Minister of Canada Justin Trudeau*, 5 January 2022, last accessed 31 March 2022, The

contend that Canada's current NSIA would likely be the best candidate to oversee strategic action plans, such as CBRNE strategies, to ensure that they are practical in application and execution when the time comes for it to be implemented. Even the NSCIOP report recognized that "the proliferation and potential use of weapons of mass destruction was another national security threat"[173] and that "the NSIA should invest in and take a stronger managerial and leadership role to ensure organizational responses to the intelligence priorities are timely and consistently implemented."[174]

Not only could this recommendation be an incredible start point to address the many challenges in Canada's national security policies, but it could also open the doors to further reinforce the requirement for Canada to develop a grand strategy that would ultimately assure that national defence strategies could be seen to realization. Otherwise, without galvanizing the national defence community, the strategic action plans will perpetually remain in a state of reactionary impetus, which only decreases the nation's defence efficacy and readiness if and when the time comes to act.

Summary

This study has observed that Canada's strategic orientation is relatively weak due to "an absence of perceived external threats along with the protective role played by the United States has ensured that strategic thinking is not a natural part of most Canada's decision makers' DNA."[175] As governments have changed throughout the years or as

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Prime Minister announces changes in the senior ranks of the Public Service | Prime Minister of Canada (pm.gc.ca)

[173] Government of Canada, "Annual Report 2018," *National Security and Intelligence Committee of Parliamentarians* (Ottawa, 2018): 29. https://www.nsicop-cpsnr.ca/reports/rp-2019-04-09/2019-04-09_annual_report_2018_public_en.pdf

[174] *Ibid*., 55.

[175] Roy Remple, "Achieving Consensus and Effectiveness in Canadian Defence Policy," in *Canadian Defence Policy in Theory and Practice* (Ottawa: Palgrave Macmillan, 2020), 254.

domestic pressures have put forth new policy priorities, defence polices have continuously incurred a tumultuous cycle from great support to minimalist efforts. In truth, "Canada's weaker strategic culture has made it particularly difficult to sustain significant investments in defence"[176] as political consensus on core defence programs has often demonstrated to be elusive. However, recent global events may change the nascent impetus for more concerted efforts to be given to defence programs and by extension veritable action plans.

In the case of CBRNE, the unfortunate truth of Canada's present readiness for a CBRNE incident is that, in all likelihood, the national defence strategies are just not ready nor well developed enough to ensure seamless implementation. Whether it is from a nebulous leadership and management structure or from a medical capacity and decontamination system limitations, the undeniable fact is that Canada is not adequately prepared for CBRNE and the likely evolution of its use in future warfare events. Certainly, there does exist an emergency management framework that outlines feasible approaches to managing a CBRNE event. Yet, it is disconcerting to note that Canada's CBRNE preparedness is considerably lacking, whether it be from a strategic perspective or from a supportable framework viewpoint. However, the Canadian government possesses a number of options and even opportunities at its fingertips to enhance its defence preparedness. By shaping its own grand strategy to buttress its defence initiatives or through empowering their own personnel to lead and invigorate actionable strategic plans, the potential for improvement is just waiting to be harnessed and given the attention it deserves. Otherwise, the outlook and general prognosis for Canada's ability

[176] *Ibid*., 255.

to manage a CBRNE incident will have devastating outcomes that will only be fully appreciated in retrospection.

Appendix 1

Link of Military Revolutions to Industrial Revolution Developments

Military Revolution	Implications
First Revolution	
Westphalian System	Revenue generation, banking and taxes for financing wars, and professional militaries
Second Revolution	
French Revolution	National mobilization, levy en masse, and large-scale armies with conscription
Third Revolution	
Industrial Revolution	Mass production, standardization, and large-scale economic exploitation
Fourth Revolution	
World Wars I & II	Combined arms, armored blitzkrieg, carriers, bombers, and jets
Fifth Revolution	
Nuclear Revolution and missiles	Nuclear weapons and intercontinental ballistic missiles
Sixth Revolution	
Information Revolution	Command and control, connectivity and instant global reach, imagery, and cyber levy en masse by violent extremists
Seventh Revolution	
Autonomous Revolution	Autonomous weapons, swarms of robotic vehicles in multiple domains, self-organizing defensive systems, automated weapons, big data analytics, and machine and deep-learning programs

Source: Hoffman, Will War's Nature Change in the Seventh Military Revolution

Appendix 2

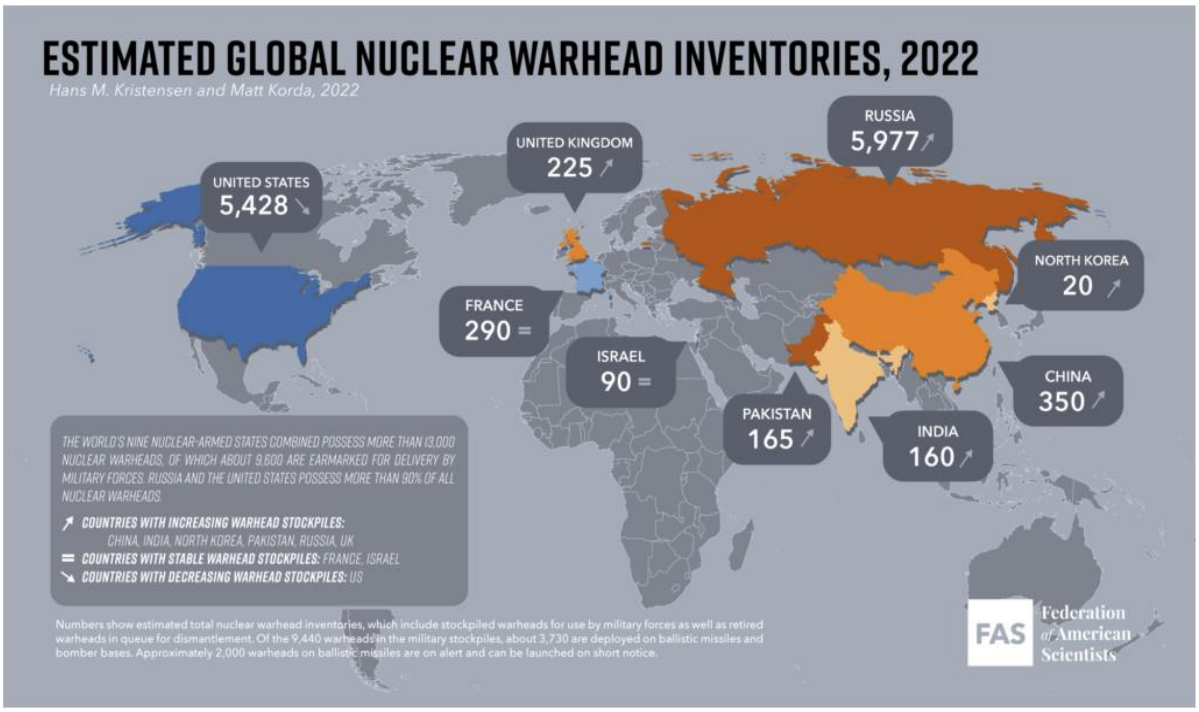
Proposed Range of Potential Nonviolent Hybrid Threat Instruments

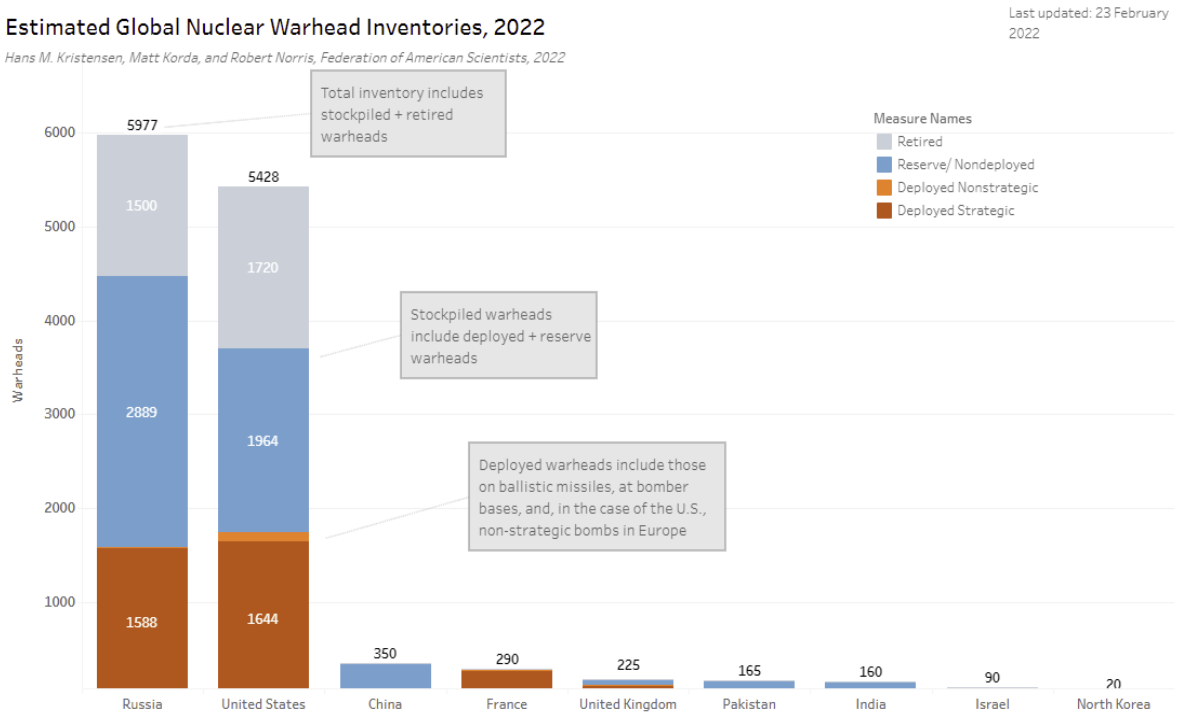
Type of instrument	Source
Cultural	Liang and Xiagsui's trans-military and non-military forms of warfare in *Unrestricted Warfare* (1999)
Diplomatic	
Network	
Intelligence	
Psychological	
Technological	
Smuggling	
Drug 'warfare'	
Fictitious/fabrication 'warfare'	
Financial	
Trade	
Resources	
Economic/economic aid incentives	
Legal/moral/regulatory	
Sanctions	
Media/propaganda	
Ideology/religion	
Forced population shifts/ migration	
Covert means	RAND study, *Modern Political Warfare* (2018)
Unconventional warfare	
Proxy warfare	
Domestic networks	Dubik and Vincent, *America's Global Competitions: The Gray Zone in Context*, ISW (2018)
Military coercion (short of war)	

Source: Monaghan, "Countering Hybrid Warfare: So What for the Future Joint Force?"

Appendix 3

Estimated Global Nuclear Warhead Inventories, 2022



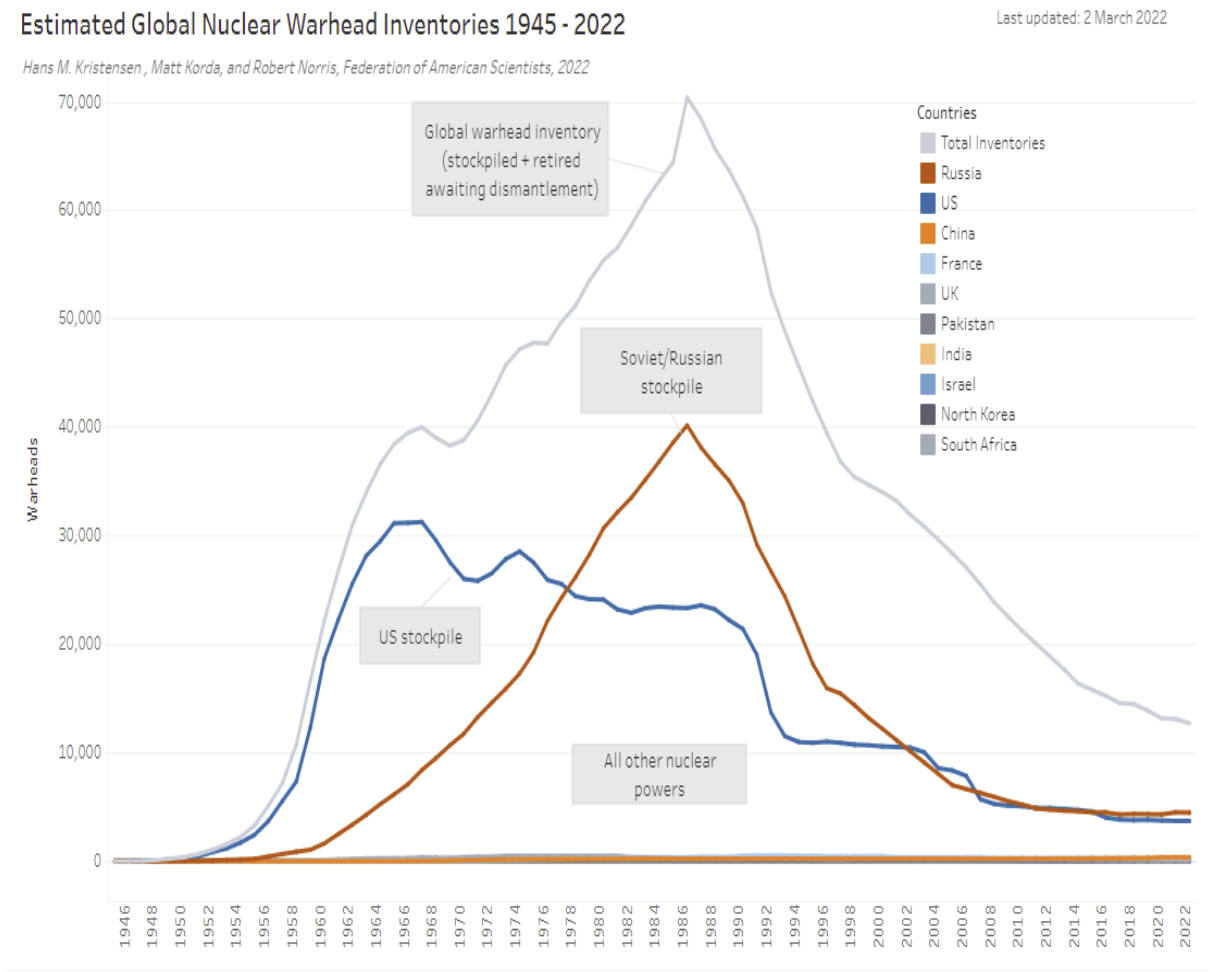


Source: Federation of American Scientists, 2022

[Status of World Nuclear Forces – Federation Of American Scientists (fas.org)]

Appendix 4

Estimated Global Nuclear Warhead Inventories 1945-2022



Source: Federation of American Scientists, 2022

[Status of World Nuclear Forces – Federation Of American Scientists (fas.org)]

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