

# **Unconventional Weapons and International Terrorism**

Challenges and new approaches

*Edited by*

**Magnus Ranstorp and  
Magnus Normark**



Series: Political Violence

# Unconventional Weapons and International Terrorism

In recent years, senior policy officials have highlighted increased signs of convergence between terrorism and unconventional (CBRN) weapons. Terrorism now involves technologies available to anyone, anywhere, anytime, deployed through innovative solutions. This indicates a new and more complex global security environment with increasing risks of terrorists trying to acquire and deploy a CBRN (chemical, biological, radiological and nuclear) attack.

This book addresses the critical importance of understanding innovation and decision-making between terrorist groups and unconventional weapons, and the difficulty in pinpointing what factors may drive violence escalation. It also underscores the necessity to understand the complex interaction between terrorist group dynamics and decision-making behavior in relation to old and new technologies.

*Unconventional Weapons and International Terrorism* seeks to identify a set of early warnings and critical indicators for possible future terrorist efforts to acquire and utilize unconventional CBRN weapons as a means of pursuing their goals. It also discusses the challenge for intelligence analysis in handling threat convergence in the context of globalization. The book will be of great interest to students of terrorism studies, counter-terrorism, nuclear proliferation, security studies and IR in general.

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Challenges and new approaches

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# Introduction

## Detecting CBRN terrorism signatures – challenges and new approaches

*Magnus Ranstorp and Magnus Normark*

In September 2007, German authorities announced they had foiled a major terrorist attack against American and German targets around the Frankfurt area. Three men were arrested in the so-called Operation Alberich, caught mixing chemical ingredients at a vacation house in the Sauerland region allegedly intended for use in three separate car bombs, targeting the Ramstein US military base; a nightclub; and Frankfurt International Airport.<sup>1</sup> What astonished investigators was not only that the three-man cell continued their attack preparations despite knowing that they were under surveillance, but also the sheer quantities of hydrogen peroxide amassed: 730 kilograms.

This incident illustrates the ready availability of vast amounts of industrial chemicals to anyone, including terrorists. One member of the terrorist cell attempted to purchase more highly concentrated hydrogen peroxide, but failed as he did not have the required permit. Instead they bought, on five occasions, 12 containers of 35 percent hydrogen peroxide which they intended to purify and distill to 75 percent using starch derived from flour.<sup>2</sup> The cell had also acquired 26 military-style detonators. If successful this cell would have launched terror attacks more lethal than the 2004 Madrid or 2005 London attacks combined. This incident raises the question of why this terror cell decided on using an explosive precursor and did not move in the direction of acquiring toxic chemicals.

The toxic scenario emerged with the adoption of chlorine cylinders in vehicle-borne improvised explosive devices (IEDs) by terrorists within the Iraqi insurgency, starting in October 2006. A month earlier, Abu Hamza al-Muhajir, leader of al-Qaeda in Iraq, had urged scientists to assist insurgents in the development of unconventional weapons for use against US military facilities in Iraq.<sup>3</sup> Over the next nine months, al-Qaeda and affiliated groups used chlorine gas attacks on at least 15 occasions against the US military, Iraqi forces and civilians. Then these types of chlorine attacks suddenly ceased. It is clear that chlorine was widely used for purifying drinking water in Iraq and as a disinfectant.<sup>4</sup> What is a mystery is why it suddenly disappeared given that this type of attack greatly amplifies the fear factor in the West. Will this type of tactical attack repertoire eventually migrate to Western cities in the same way that IED construction has migrated from the Iraqi to the Afghan operational theatre?

Both these incidents from Germany and Iraq illustrate the crucial importance of understanding innovation and decision-making within the context of threat convergence between terrorist groups and unconventional (CBRN) weapons and the difficulty in pinpointing what factors may drive violence escalation. It also underscores the necessity of understanding the complex interaction between terrorist group dynamics and decision-making behavior in relation to old and new technologies.

The very fact of threat convergence between terrorism and CBRN elevates the nature of the threat from a tactical level to a strategic dimension; it is quite remarkable how little corollary intellectual effort has gone into further understanding or identifying when, under what circumstances and how this convergence process will occur. The starting point for this book originated from a threefold observation.

First, senior policy officials have more and more underscored the increased signs of this convergence between terrorism and CBRN weapons without divulging the exact contours of what the threat looks like. Aum Shinrikyo; September 11 attacks by al-Qaeda; AQ Khan network and nuclear technology proliferation; anthrax; weak and failed states; new technologies available to anyone, anywhere, anytime; all these factors have been raised as indicators of a new and more complex global security environment that indicates it is not a question of if, but when, a terrorist group deploys a major CBRN attack. Scores of Western officials publicly warn us that the day is creeping closer when terrorists will use weapons of mass destruction of unconventional means. Even former UN chief Kofi Annan is somber in his outlook, as exemplified by his address to the Madrid conference announcing the UN counter-terrorism strategy: "Nuclear terrorism is still often treated as science fiction. I wish it were." Few government officials or analysts are privileged enough to have insights into the spectrum of early warning signals that collectively worry world leaders. Many analysts operate from an incomplete operational picture or from old, static assumptions devoid of precision or crucial details. Nevertheless, most public assessments are uniformly grim, as illustrated by Germany's Foreign Minister Joschka Fischer, stating that "the use of nuclear weapons by terrorists would not only result in a major humanitarian tragedy, but also would most likely move the world beyond the threshold for actually waging a nuclear war."<sup>5</sup> What lies behind these apocalyptic warnings, and what is the real likelihood of terrorists using CBRN weapons?

Second, most conferences dealing with the issue of threat convergence between CBRN and terrorism often end up with over-generalizations or stove-piped discussions between scientists as to what is technically possible and feasible, on the one hand, and social scientists trying to guess intentions by drawing on a limited repertoire of case studies involving CBRN incidents and terrorism, on the other. This leads not only to the methodological problem of mixing vastly different contexts and terrorist groups in an indiscriminate fashion, but also to rather imprecise guesswork. A striking feature of most conferences or workshops trying to address CBRN terrorism is how seldom they are successful in pushing the envelope of knowledge by finding fruitful avenues of convergence between the hard sciences and social and behavioral sciences. How do you

create synergies between different disciplines' understanding of threat convergence from a multitude of analytical perspectives?

Third, the academic community has made relatively few notable advances in furthering our understanding of threat convergence. As identified by Gary Ackerman, a recent survey of all WMD terrorism publications indicated that the field has "reached something of an 'interpretative impasse'" that is reminiscent of the problems associated with early terrorism studies research with a small, closed, epistemological community and the recycling of the same material (usually Aum Shinrikyo) and the same assumptions about the trajectory of procurement, weaponization and deployment.<sup>6</sup> There are notable exceptions where valuable contributions have been made in the past, but very few studies provide groundbreaking avenues for further understanding of this complex issue. Even fewer studies exists that question how we know what we know, as several reported CBRN terrorism cases are fictitious or highly questionable in terms of the scientific facts surrounding the actual chemical or biological agents involved.

This threefold observation is illustrative of the kaleidoscope of major methodological challenges involved in understanding the threat convergence between CBRN and terrorism. This approach became the starting point for our intellectual effort of trying to push the envelope of knowledge in certain research areas, trying to bridge the necessary technical dimensions with a better granulated assessment of terrorist intentions. This proved to be by its very nature a difficult but necessary exercise.

This book is the cumulative result from an international workshop on CBRN and terrorism threat convergence, held at the Swedish National Defence College August 10–13, 2007, where we gathered relevant and recognized international expertise from academia and government. A number of central overarching questions emerged as critical for our assembled research team to bear in mind:

- To what degree are there substantial indications that CBRN weapons are becoming attractive methods for terrorists?
- What does CBRN terrorism entail in relation to incentives to escalate or enhance the effects of violent means and what are the necessary levels of competencies, funds, logistics and other resources for building a capacity and setting the preconditions for a successful attack?
- What are useful methodological approaches to capture the increasing complexity and technological change in relation to CBRN terrorism pathways?

As eloquently underscored by Nancy K. Hayden from Sandia National Laboratories, "to understand the evolutionary dynamics of motivations, the interplay between competing motivations of actors and how trajectories toward or away from WMD proliferation are influenced by state actions, there needs to be more extensive research into second order effects."<sup>7</sup>

What we do know is that contemporary terrorist groups have been thinking long and hard on the prospects of acquiring CBRN weapons and that leading Salafist-Jihadist leaders have made efforts to influence networks or agents of



influence worldwide to pursue this capacity by extensive rhetoric and information campaigns justifying the pursuit of escalated effects of violence, indiscriminate killings and the use of CBRN weapons. This visible elevation of CBRN into the realm of the Salafist–Jihadist discourse suggests that there is at least a possibility that a range of non-state actors may pursue a path toward acquiring CBRN weapons capability for terror purposes.

No matter how likely or unlikely one may perceive the CBRN terrorism threat to be, the potential consequences of such an event in combination with the cascading effects of technological development and horizontal proliferation necessitates the development of a methodological approach to better analytically capture the multidimensional and complex nature of this threat conversion. Furthermore, development of new mechanisms to sense various capacities for groups moving in this direction is necessary, given the tremendous consequences should these groups decide to pursue a CBRN path in the future.

### **What is meant by the term “CBRN”?**

We have chosen to use the term CBRN in our study objectives to take into account all uses of chemical, biological, radiological and nuclear substances and materials for mass-impact terrorist purposes. The term “weapons of mass destruction” (WMD) has to a large extent become a political one with a bad appellation, especially after the US arguments for the attack on Iraq in 2003. In general, the term WMD often refers to classical chemical, biological and nuclear agents and materials, weaponized through some form of militarily significant carrier system which, for most part, is in the hands of so-called “rogue states.” As such, the term “WMD” does not distinguish enough between the vast spectrum of different technical aspects that exists within this category of violent means and methods. Strictly speaking, the only category of weapon capable of *true* mass destruction is nuclear weapons. These significant differences have been taken into account in this study as we deal with the individual categories of agents and materials, in regards to their accessibility, effects and inherent properties for terrorist purposes, organized and discussed separately in individual chapters.

The potential factors influencing terrorists’ approach to violent means and methods, on the other hand, are slightly different in character and have to a large extent common grounds over the wide spectrum of CBRN tracks. At the center of these aspects lie the possible *incentives* and *disincentives* to change or develop the toolbox for violent means from the current, conservative and traditional *modus operandi* in regards to the choice of hardware for terror attacks. Closely connected to this is the general notion of enhancing the psychological effect that choosing CBRN options entails in comparison to bullets and explosives.

### **Structure and approach**

The focus of this research study is to explore new and innovative ways forward in better understanding and predicting the potential convergence between CBRN

weapons<sup>8</sup> and terrorism. The starting point (and inspiration) for this approach is the critical perspective of Gary Ackerman who, based on a meticulous state-of-the-art review of the literature and knowledge base, concludes that WMD terrorism research has reached “an interpretative impasse.”<sup>9</sup> The past may not be a good indicator for future epochal leaps in technological evolution and how terrorist groups view and assess these weapon options. New approaches are necessary to consider convergence of different knowledge bases to better address the complexity of the variables involved.

This study has adopted an approach aimed to understand the multidimensional aspects of non-state actors: their group dynamics, incentives and potential capacity-building signatures in the process of acquiring and deploying a CBRN terror capacity (see Figure I.1). The main challenge in this approach is to look beyond the few and, from the terrorist groups’ perspective, relatively unsuccessful CBRN terror attempts that have been made so far. The principal aim is to unlock the potential innovative capabilities of a non-state actor for creating a “successful” mass-impact CBRN-based terror incident.

From the top-down perspective (see Figure I.1), this study seeks to understand the overlapping proliferation environments as they move toward the non-state actor/group perspective. What factors and early warning signals exist within this type of technical/environment-based approach?

The principal goal of this study is to identify a set of early warnings/critical indicators for possible future terrorist efforts to acquire and utilize CBRN weapons as a means to pursue their goals. In this context some aspects can be singled out as highly relevant in order to explore details facilitating the process of

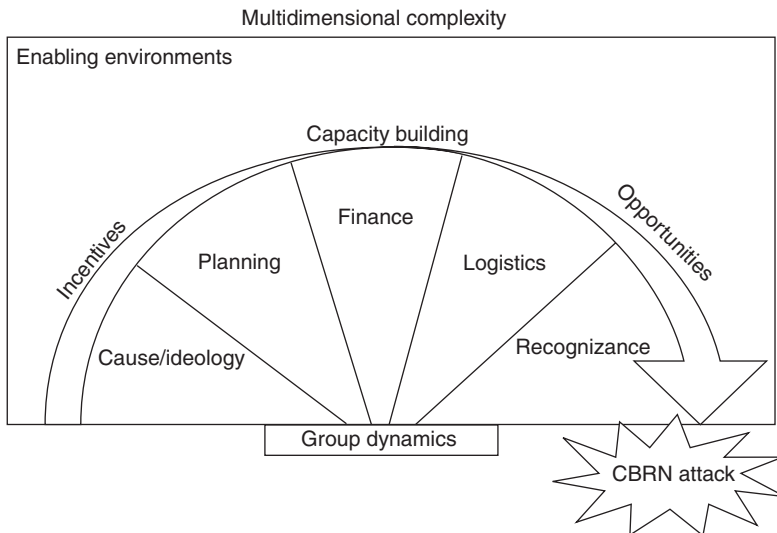


Figure I.1 The complexity of terrorist targeting versus proliferation environments.

understanding the complexity of the CBRN terrorism domain and possible future expressions of such a development.

A starting point for this study was to identify the state-of-the-art knowledge on threat convergence (CBRN terrorism) taking into account the contemporary research efforts made over the last two decades. The principal aim for such an approach was to identify possible knowledge gaps and to find new innovative approaches for future waves of research efforts.

It is clear that CBRN terrorism is not a prioritized choice for most terrorist groups in their decision to employ violence. This very fact raises avenues to explore critical factors that influence the choice of what kind of violent means are pursued to achieve their goals; what factors can push them into another direction in the future and what can impel them to broaden their toolbox to include CBRN means in their attack mode? These critical issues are at the heart of the challenge to understand the threat and, if approached in a nuanced way, will provide us with a set of potential factors to consider in monitoring pathways in this direction, in order to block or divert activities of this kind to counter such development. It is also necessary in order to build CBRN terrorism resilience in our societies, making us less vulnerable to such attacks.

Understanding terrorism behavior and motivation is also important, especially the question of what drives innovative capacity within terrorist groups in regards to violent means and *modus operandi*, and whether it is possible to distinguish if and to what extent ideological and political factors play any role in decisions to pursue CBRN methods.

Another significant aspect of this study is the issue of terrorists' capacity-building and the exploration of what stage in a terrorist groups' preparations for a CBRN attack is most likely to reveal critical indicators for counter-terrorism (CT) purposes. Some of the important aspects to specifically examine are the specific nature of potential indicators in terms of acquisition of technical resources and competencies and to assess the state–non-state nexus.

Which states possessing WMD capabilities (past or present programs) could potentially support non-state actors with means to carry out a CBRN mass-impact attack? Furthermore, given that there are terrorist groups around the world with an interest in acquiring CBRN capabilities for terror attacks, it is relevant to discuss what type of environment could facilitate opportunities for non-state actors to develop a CBRN weapon and prepare a CBRN attack. It's generally assumed that weak and failed states would facilitate an environment and opportunities for developing illicit CBRN means for terrorism purposes with little risk of interruption or obstruction. To what extent would the competencies, materials and equipment needed for the development of CBRN weapons be accessible in these areas? Would terrorist groups regard illicit efforts too risky to be pursued in a European country, where materials and technology are more commonly available for military, civilian or industrial use? All these issues are important to examine and could provide new valuable contributions in order to facilitate means for detection of pathways toward CBRN terrorism for the future.

After discussing the various incentives for terrorists to pursue a CBRN path toward terrorism, as well as the signatures of such efforts through indicators, this study focuses on the thorny issue of methodology to capture this complexity. How does the world of intelligence analysis approach these multifaceted and difficult threat convergence issues in their approach to uncertainty and complexity, specifically in predicting threat convergence? Are there methodological approaches which would be suitable for the intelligence community and other law enforcement functions to develop in order to understand and detect non-state actors' possible commitment to deploy a CBRN weapon for terror purposes? From the academic community and government-sponsored scientists, what are the cutting-edge questions that remain unanswered and how should one approach so-called "wicked problems" and social complexity? What should future research focus on and why?

### **Structure of book chapters**

This book is divided into four parts and provides a rich analytical smorgasbord in asking and identifying critical questions and avenues for approaching the issue of CBRN terrorism threat convergence.

The first section of this book is dedicated to framing the field of CBRN terrorism research. Gary Ackerman of the University of Maryland provides an excellent review of the status of the current research field and outlines a series of aspects of CBRN terrorism which he argues have been given insufficient attention by the research community. He points out that the current research wave during the past five years has added little to further our insights and knowledge of threats and risks of CBRN terrorism. He argues forcefully, with striking examples of why it truly is a case for "interpretative impasse" within the field but, more importantly, navigates us through the methodological pitfalls and provides novel pathways which can be applied in order to explore new ways and methods that can advance CBRN terrorism research beyond the current status.

The second part of the book is centered on discussing the various factors influencing terrorists' attitudes toward CBRN weapons. Brian Fishman and James J.F. Forest of the Combating Terrorism Center at the US Military Academy, West Point explore terrorists' perspectives on CBRN as violent means and possible incentives for approaching the use of such weapons in the near future. The foremost focal point of this chapter is the various forms and shapes of al-Qaeda. Fishman and Forest present an insightful perception of the ideology that unites al-Qaeda and what this ideology suggests about the organization's general interest in CBRN weapons. By exploring the strategic calculations behind most terrorist groups' interest in CBRN weapons from the two factors of complexity and intended impact, they suggest an analytical framework for assessing vital factors terrorists have to consider in order to approach a CBRN pathway toward a terrorist attack. Fishman and Forest conclude their contribution by applying this analytical framework in order to assess the mode of CBRN attack most likely to fall into the respective dimensions of the al-Qaeda network.

Anne Stenersen of the Norwegian Defence Research Establishment continues the exploration of al-Qaeda-affiliated actors' viewpoint toward CBRN terrorism by critically scrutinizing the discussions and literature found on some of the radical Islamic internet sites affiliated to the al-Qaeda network. Al-Qaeda's active use of the internet over the last few years has given researchers access to some of the primary sources behind militant Islamism, including a wide range of jihadi training manuals and handbooks, of which some are dedicated to CBRN weapons. Anne's valuable research reveals important findings such as the limited consideration which the Islamists, active on these internet sites, give to the issues of CBRN as a violent means for reaching their objectives, as well as the undisputable fact that the manuals and the substance of the discussion forums found on these websites display a clear lack of basic knowledge of CBRN materials, acquisition, research and dispersion, as well as innovative capability.

In the third part of the book we move into CBRN terrorism research from a technical perspective in an effort to merge the dimensions of actors, ideologies, incentives and strategic calculations with the "hard side" of the nebulous conversion equation of the terrorism threat: CBRN means and methods.

Amy E. Smithson of the Monterey Institute's Center for Nonproliferation Studies initiates this part of the book by exploring the potential characteristics of chemical weapons (CWs) that might attract terrorists to pursue such a path for violent means. Amy highlights potential acquisition and utilization routes for terror attacks with CWs, and in that process identifies a wide range of more or less critical indicators of such activities. In this chapter Amy elaborates on potential interaction between states and terrorists in the latter's efforts to acquire CWs as well as potential technological developments and advances that may lower the current threshold for terrorists to incorporate CWs in their regular toolbox. She concludes her insightful contribution by exploring the potential shortcut for terrorists' to create chemical disasters by targeting key chemical industrial facilities, transports, etc.

Next Gabriele Kraatz-Wadsack from the United Nations WMD Branch provides an excellent discussion of normative multilateral arms control approaches, past and present, to biological non-proliferation mechanisms. She continues with a perceptive discussion on procurement of equipment and materials for biological weapons, through her experiences of lessons learned from the UN mission in Iraq. This chapter is particularly valuable for identifying critical indicators for approaches toward acquiring and utilizing biological weapons. Gabriele argues that in regards to critical indicators for bioterrorism, there are many checkpoints and few choke-points, making such activities very hard to detect in time.

A third contribution from the technical perspective is authored by Walter Biederbick from Germany's Robert Koch Institute, who scrutinizes a selection of potential biological warfare agents for terrorist attacks. Walter critically views the accessibility of these agents and the required level of knowledge these agents demand in order to be utilized and dispersed as weapons. He concludes his contribution by elaborating on the bioterrorism threat in the future by looking at technological developments, proliferation of knowledge and means and costs for employing biological agents in terror attacks.

Charles D. Ferguson from the Council of Foreign Relations concludes the section on technical perspectives on CBRN terrorism by discussing “influence diagram analysis” as a methodological approach toward assessing the potential that terrorists will converge on the pathways of nuclear and radiological weapons. In this process Charles highlights potential influences and decisions terrorists must face and challenge on the path toward employing nuclear or radiological attacks, and through this identifies possible indicators and thresholds for such activities.

The last part of this book is dedicated to the methodological challenges approaching so-called “wicked problems,” characterizing the complex dimensions of twenty-first-century national security. It examines the intelligence community’s (IC) perspectives of the risk of threat convergence and the challenges of approaching the complex dilemma of detecting and assessing the CBRN terrorism threat. Greg Treverton shares his extensive experiences as a senior IC practitioner and academic at RAND, discussing the difficulties in this field of sense-making for intelligence analysts by highlighting the dramatic change in targets for the intelligence communities in regards to international terrorists and the implications and challenges it represents. Greg caps his contribution by illustrating these challenges through the prism of CBRN terrorism complexity. He outlines a Bayesian, iterative process approach that the intelligence community needs to adopt in order to adjust its methods to new complex challenges, and highlights the importance of involving a multidiscipline set of experts working under the awareness that uncertainties cannot be completely resolved.

Nancy Hayden from Sandia National Laboratories argues in her chapter that we need to include much more complex scenarios between state and non-state actors when considering motivations and interventions of terrorist activity. She discusses the merits of various analytic methodologies for handling so-called “wicked problems” such as social-science modeling and simulations, as well as state-of-the-art social-network analysis. Nancy critically reviews the merits of various methodological approaches and provides a useful menu of research questions that are urgently needed to be addressed by the scholarly and policy communities.

And finally, the editors provide a concluding chapter where they reflect on the previous chapters and discuss where we should head in our next collective and individual research efforts.

## Notes

- 1 Mark Landler, “German Police Arrest 2 in Terrorist Plot,” *New York Times*, 6 September 2007.
- 2 For a detailed description of the plot, see: Simone Kaiser, “How the CIA Helped Germany Foil Terror Plot,” *Spiegel Online*, 10 September 2007. Available at: <http://spiegel.de/international/germany/0,1518,504837,00.html>.
- 3 Sammy Salama and Gina Cabrera-Farraj, “New Leader of Al Qaeda in Iraq Calls for Use of Unconventional Weapons Against U.S. Forces: Possible Poisoning of Iraqi Security Forces at Central Iraq Base,” *WMD Insights*, November 2006. Available at: [www.wmdinsights.org/I10/I10\\_ME1\\_NewLeaderAlQaeda.html](http://www.wmdinsights.org/I10/I10_ME1_NewLeaderAlQaeda.html).

- 4 Richard Weitz, Ibrahim Al-Marashi and Khalid Hilal, "Chlorine as a Terrorist Weapon in Iraq," *WMD Insights*, May 2007. Online at: [www.wmdinsights.org/I15/I15\\_ME1\\_Chlorine.htm](http://www.wmdinsights.org/I15/I15_ME1_Chlorine.htm)
- 5 Joschka Fischer, "The New Nuclear Risk," *Guardian*, 31 March 2008.
- 6 Gary Ackerman, "WMD Terrorism Research: Whereto from Here," *International Studies Review*, Vol. 7, No. 1 (2005): p. 137.
- 7 Nancy Hayden, "Terrifying Landscapes: A Study of Scientific Research into Understanding Motivations of Non-state Actors to Acquire and/or Use Weapons of Mass Destruction," Defence Threat Reduction Agency, June 22, 2007.
- 8 Chemical, biological, radiological or nuclear means to achieve a mass-impact terror incident in terms of physical, psychological and social effects.
- 9 Gary Ackerman, "WMD Terrorism Research: Whereto From Here?"