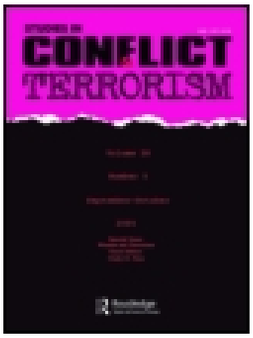

Studies in Conflict & Terrorism

ISSN: 1057-610X (Print) 1521-0731 (Online) Journal homepage: http://www.tandfonline.com/loi/uter20

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To cite this article: Richard Falkenrath (2001) Analytic Models and Policy Prescription: Understanding Recent Innovation in U.S. Counterterrorism, Studies in Conflict & Terrorism, 24:3, 159-181, DOI: 10.1080/10576100151130252

To link to this article: http://dx.doi.org/10.1080/10576100151130252

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Studies in Conflict & Terrorism, 24:159–181, 2001
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Analytic Models and Policy Prescription: Understanding Recent Innovation in U.S. Counterterrorism

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The threat of terrorism, particularly terrorism involving a weapon of mass destruction (WMD), has received enormous attention in the last decade. Since the mid-1990s, the federal government has embarked on a concerted national effort to prepare the country for acts of WMD terrorism. A key component of the counterterrorism agenda is the domestic preparedness program, a series of initiatives aimed at reducing America's vulnerability to a WMD terrorist attack. However, there is a heated debate over whether or not the United States needs a domestic preparedness program at all. This article argues that much of the debate originates in disparate approaches to analyzing terrorism. Terrorism studies specialists use an internal model that analyzes the root causes, motives, and historical patterns of terrorism and concludes that the threat of WMD terrorism against the United States is not sufficient to warrant the domestic preparedness budget. Policy makers and national security experts, however, rely on an external risk assessment model that considers terrorism within the context of the many risks to American security. This assessment model evaluates WMD terrorism on the basis of risk and consequences, and reaches a logical conclusion that the potential for mass destruction not only merits, but also requires a level of domestic preparedness.

The threat of terrorism has received enormous attention in the last decade. Anxieties ran particularly high at the turn of the millennium, which fortunately passed without a major terrorist incident. Virtually all states expend some resources to combat terrorism. The policies, programs, and operations that governments undertake to meet this challenge are known collectively as counterterrorism. Although this term is only a few decades old, the practice of counterterrorism is as old as terrorism itself. Like terrorism, counterterrorism is easily recognized, even if its boundaries are somewhat imprecise.

Something new and interesting has been occurring in the practice of counterterrorism in the United States since the mid-1990s. The federal government has embarked on a

Received 10 October 2000; accepted 12 December 2000.

The author thanks Geoffrey Chapin, David Grannis, Gregory Koblentz, Michele Malvesti, Carlotta Stern, Rebecca Storo, and especially Robyn Pangi for their assistance with this article. He also expresses thanks to Diane McCree for her editorial assistance.

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concerted national effort to prepare the country for acts of terrorism involving weapons of mass destruction (WMD).[1] This effort, known as domestic preparedness,[2] involves the creation of multiple new programs that provide specialized training and equipment to various response personnel, sponsor new research and development projects, collect information on potential threats, and aim to improve the coordination and organization of governmental efforts. U.S. counterterrorism budgets increased rapidly in the late 1990s, but no sector has grown faster than the domestic preparedness program, the budget of which rose from essentially zero dollars in 1995 to approximately $1.4 billion of the $8.4 billion total federal counterterrorism budget by fiscal 2000 (see Table 1). In the late 1990s, the government established more than a dozen new federal offices to address various aspects of the domestic preparedness mission.[3] Many of the activities carried out under the rubric of domestic preparedness are related to other well-established government functions, such as emergency management, hazardous materials response, public health administration, and military WMD defense. Domestic preparedness, however, is wholly new as a distinct element of governmental counterterrorism programs, not just in the United States but also worldwide. No other state has ever had a domestic preparedness program like the one now being developed in the United States.[4]

Aside from its newness, the U.S. domestic preparedness program is noteworthy for at least two reasons. First, implementation of the program is extremely complex, and effective response involves a wide range of technical requirements. A goal of the U.S. domestic program, therefore, is to enhance those operational capabilities that are important to the task of responding to WMD terrorism but are deficient in their current form. This task is hard in part because of the uncertainties inherent in the threat assessment that

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Table 1
Federal funding for combating terrorism, FY 1998–2001

	FY98 Actual		FY99 Actual		FY00 Enacted		FY01 Request	
Function	Overall	WMD	Overall	WMD	Overall	WMD	Overall	WMD
Law enforcement and investigative	2655	72	2687	102	2820	94	3025	143
Physical security of government	2894	175	4356	199	3637	201	4259	185
Physical security of national populace	147	3	257	4	250	4	267	4
Preparing for and responding to terrorist acts	418	155	930	564	984	619	947	633
Research and development	403	240	527	369	728	537	813	590
Total	6516	645	8757	1238	8420	1455	9311	1555

Note. Figures given in millions of nominal dollars.

Source: Office of Management and Budget, *Annual Report to Congress on Combating Terrorism: Including Defense Against Weapons of Mass Destruction/Domestic Preparedness and Critical Infrastructure Protection*, 18 May 2000, pp. 49, 59. For further detail, see Gregory Koblentz, "Overview of Federal Programs to Enhance State and Local Preparedness for Terrorism with Weapons of Mass Destruction," BCSIA Discussion Paper, forthcoming.

motivates the program, and in part because of the analytic problem of understanding the relationship between genuine technical requirements and existing but deficient capabilities. Yet, the most serious challenge to the implementation of the U.S. domestic preparedness program arises from the fact that even though the program originated and is funded at the federal level, the objectives of the program cannot be achieved solely by pursuing improvements at that level. U.S capabilities relevant to a WMD response are distributed widely and unevenly throughout an extraordinarily complex latticework of functionally organized agencies; levels of government (federal, state, county, and local); and public, private, and nongovernmental actors.[5]

Second, there is a debate over whether or not the United States needs a domestic preparedness program at all. Even though the specific policy significance of this debate appears to be diminishing (official Washington seems to have decided that a large-scale program to counter the threat of WMD terrorism *is* necessary), the debate is nonetheless interesting as a case study of the ways in which different analytic models influence policy outcomes. The rationale for the U.S. domestic preparedness program is not obvious, especially to those who have spent their careers thinking about the problem of terrorism. Aside from a few marginal cases with little potential for anything close to mass destruction, only one significant terrorist attack has involved WMD: the release of a nerve agent by the Japanese cult Aum Shinrikyo in the Tokyo subway in March 1995.[6] Terrorism has been extensively studied since the 1960s, revealing two interesting facts. First, terrorists generally do not try to kill as many people as they can. Second, terrorists tend to be tactical conservatives content with conventional weaponry, mainly guns and explosives. Given these facts, many terrorism analysts have been puzzled by, and critical of, the U.S. decision to invest more than $1 billion per year in domestic WMD preparedness.

Thus, there is a discrepancy between the expectation of specialists on terrorism and the policy outcome of the U.S. domestic preparedness program. The most common explanation for this discrepancy is that policymakers are behaving illogically, either out of ignorance or because they harbor ulterior motives (i.e., personal or institutional interests).[7] This explanation seems to be the most widely held, particularly by terrorism specialists who oppose the domestic preparedness program.[8] A closely related explanation focuses on a specific aspect of policymaker ignorance, namely the misinterpretation of the Aum Shinrikyo case. Through detailed study of the Aum and its chemical and biological weapons program, several experts have concluded that the real lesson of the Aum case is that only an incredibly improbable combination of factors will cause a non-state actor to seek to acquire and use WMD,[9] and that even a exceptionally wealthy and well-educated non-state actor will have great difficulty doing so successfully.[10] These experts argue, therefore, that a major U.S. policy response to the threat of WMD terrorism is unwarranted given the true character of the only real exemplar of the threat.

In this article I argue for an alternative explanation of the discrepancy between the expectation of specialists on terrorism and the policy outcome of the U.S. domestic preparedness program is argued: The policy outcome resulted from a mode of analysis that the substantive specialists do not perform. Put differently and more generally, a policy prescription that is illogical according to one analytic model of a problem may be perfectly logical according to another.[11] The substantive experts on terrorism adhere to an analytic model known as, for lack of a better term, "terrorism studies." Its hallmark is a focus on the practice and especially the practitioners of terrorism. In social–psychological terms, terrorism studies is an "internal" approach to prediction because it focuses on the constituents of the specific problem rather than on the broad distribution

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of possible outcomes.[12] Thus, using terrorism studies as the analytic model, it is hard to find a rational explanation for the origin of the U.S. domestic preparedness program.

The U.S. domestic preparedness program is readily explained, however, if the intellectual step of adopting an "external" analytic approach to the problem of WMD terrorism is made. This involves conceiving of WMD terrorism not as the action of a particular subset of society (i.e., terrorists), but as one particular kind of risk among many facing a nation.[13] Assessing terrorism as risk involves evaluating its probability and consequence: Abstract attributes that can be usefully compared and are possessed, in one way or another, by all forms of injury that could befall a nation.[14] Terrorism experts, like many highly specialized professionals, are decidedly uncomfortable thinking about the subject of their studies in the context of every other problem facing society, which explains in part their skepticism of the U.S. domestic preparedness program.

This article develops the argument in two main sections. The first surveys key insights of the terrorism studies literature, focusing particularly on those related to the prospects of WMD terrorism and specifying the ways in which terrorism studies is, and is not, relevant to policy. The second examines terrorism through a distinct analytic model of "risk management," and assesses in qualitative terms the problem of WMD terrorism in a manner unlike the assessment reached through the terrorism studies model. This section also describes some of the problems of applying the risk management model to national security threats like WMD terrorism.

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Terrorism Studies: Insights and Contributions to Policy

The literature on terrorism is vast.[15] Most of this work focuses on the practitioners of terrorism, that is, on the terrorists themselves. Different strands within terrorism studies consider, for example, the motivations or belief systems of individual terrorists; the external strategies or internal dynamics of particular terrorist organizations; or the interaction of terrorist movements with other entities, such as governments, the media, or social subgroups. The field has yielded a wealth of specific information about terrorism as it has been practiced in the past, as well as genuine insights into how it might be practiced in the future. A few of these insights are described later.

Terrorism studies aspires not just to scholastic respectability but to policy relevance. The sheer size of the terrorism studies literature can only be explained by the wider social importance of terrorism and, in particular, by the interest of governments in the subject. It has helped organize and inform governmental counterterrorism practices. But terrorism studies does not generate answers to *all* questions important to the practice of counterterrorism. Because terrorism studies is the dominant mode of thought informing the governmental practice of counterterrorism, it is important to clarify the ways in which the model is and is not policy relevant.

Definitions and Statistics

There is no agreed definition of terrorism or consistent system for categorizing it. Historically, the quantity and diversity of organized violence has been enormous. Yet, experts are often at odds over which subset of acquired violence should be labeled "terrorism." Most definitions of terrorism seek to narrow the field by focusing on the nature of the act (e.g., violence directed against third parties, often civilians with no direct role in the terrorists' grievance), the intentions behind their violent acts (e.g., to achieve some particular purpose, usually by instilling fear), or the type of actor involved

(e.g., certain kinds of substate groups).[16] Even the narrowest definitions of terrorism, however, reflect great diversity in the precise organization, motivation, and tactical practices of the terrorists. The difficulty of defining terrorism has also been compounded by the rhetorical power of the word "terrorist"—a power that has caused many, both inside and outside of government, to define and apply the word in ways that serve their particular preferences. Terrorism and terrorists have also proven difficult to categorize consistently, with terrorism experts offering multiple typologies of their subject of study, none of which dominates the profession.

Several organizations maintain statistical databases of terrorist incidents.[17] These statistics, however, are incomplete and inconsistent; because of their unreliability, they must be used cautiously in analysis. Several reasons account for the generally low quality of statistical information on terrorism:[18]

- Without a universally accepted definition, there can be no consistent counting rules for developing terrorism statistics. None of the existing databases on terrorism uses the same definition.[19]
- The statistics provided by nongovernmental organizations rely on data culled from news reports. Hence they are biased toward the most newsworthy forms of terrorism and against less newsworthy forms.
- The statistics provided by governments, on the other hand, use definitions and counting rules that are influenced by policy considerations. Governments have typically been reluctant, for example, to label as "terrorist" a group whose cause they regard as just, or to whom they are providing material assistance.
- Gathering cross-sectional or time-series data on domestic terrorism has proven totally unmanageable for reasons of definition, scale, and government preferences.[20] Because analysis tends to follow available data, most trend analysis has focused on international terrorism. Moreover, the incidence of domestic terrorism is very uneven, with a handful of countries, such as Algeria, Colombia, Congo, India (Kashmir), Sierra Leone, Sri Lanka, and Yemen accounting for the majority of incidents. These cases also illustrate the problem of defining terrorism, because many of these incidents could also be understood as the actions of long-running civil wars, though the local governments prefer to label their adversaries as "terrorists."
- Databases on terrorism are not perfectly consistent over time: They cover (with occasional gaps) different time periods, and once in awhile the counting rules may change.
- Analysts may wish to include attempted but foiled terrorist events in their conclusions, but averted attacks are impossible to compile statistically.
- The inability to identify the parties responsible for some attacks may complicate data classification or determination of a terrorist event.

The U.S. Department of State provides the most consistent, readily available time-series statistical information on terrorism. Even this database, however, has serious problems. First, it looks at only international terrorism, ignoring altogether the far more prevalent phenomenon of domestic terrorism.[21] It is not, in other words, a representative sample of terrorism in general. Second, the definition of what qualifies as international terrorism is influenced by U.S. policy preferences. For instance, the U.S. Department of State has counted Hezbollah attacks against targets in Israel, but would not count Israeli attacks against targets in occupied southern Lebanon. Similarly, the data do not include

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cross-border terrorist acts committed against the government of former Yugoslavia by the Kosovo Liberation Army. For lack of a better alternative, the State Department's data is used in what follows to provide a rough quantitative illustration of the magnitude of the terrorist threat.

In general, labeling terrorism as "domestic" or "international" complicates analysis. Some experts focus solely on international terrorism, which tends to simplify analysis by excluding many revolutionary movements and criminal syndicates, and thus narrowing the range of cases. Many governments, including the United States, divide bureaucratic responsibility and legal authority according to this domestic–international distinction. Governments may have good reasons for apportioning internal responsibility this way, but the practice is legally entrenched, bureaucratically expedient, and an artifact of a simpler, less globally interconnected era. Today the domestic–international distinction tends to confuse the understanding of terrorism, and its rigid application tends to weaken counter-terrorism efforts. Terrorism is best conceived of as a transnational phenomenon, with domestic and international elements mixed idiosyncratically together. Given that no modern state can seal itself off from the international community, the domestic–international distinction contributes to the fragmentation of a state's preparedness efforts, as well as to the perpetuation of differential zones of vulnerability and readiness.

Observed Terrorist Tendencies

The scholarly study of terrorism addresses a set of questions familiar across the social sciences. Why does terrorism occur? What motivates terrorists? What strategies and tactics do terrorists employ to achieve their goals? How do terrorist movements organize themselves internally? How do terrorists perceive their external environment? Under what conditions will terrorists abandon their violent struggle? The success of the terrorism studies literature in answering these questions is uneven.

With respect to the most fundamental question of terrorism—Why does it happen?—it has proven much easier to explain why individuals do not become terrorists than why they do. Terrorist movements almost always fail in the sense that they very rarely achieve their long-range strategic objectives and, eventually, their governmental adversaries generally get the better of them.[22] If terrorism had a better record of long-term success, it would doubtless be a substantially larger global problem than it is.

A variety of root causes of terrorism have been identified—injustice, oppression, poverty, victimization, nationalism, and ideological or religious extremism—but these characteristics apply to very large populations, the vast majority of which never become terrorists. Similarly, the specific motivations of individual terrorists and terrorist movements vary enormously. Thus the most powerful analyses of the origins of terrorism tend to be highly specific, applying only to a single terrorist movement or an individual terrorist, and rooted in particular social and psychological circumstances. The literature contains no satisfactory general explanation, but rather only highly case-specific analyses of why individuals become terrorists.

Once they form, terrorist organizations tend to be internally conservative. Like all political bodies, terrorist groups are interested in self-preservation, and hence are as risk averse as their organizational self-definition allows them to be.[23] Among other things, self-preservation requires that terrorists avoid revealing their location to the governments they target. Terrorists must exercise extreme caution when doing anything that might attract the attention of the authorities because they survive by blending in with society.[24]

Risk aversion also makes terrorists reluctant to experiment with tactical innovations.[25]

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There is some evidence of copycatting among terrorists, with one group imitating the successful tactic of another, producing occasional clusters of similar incidents—for example, aircraft hijacking, hostage taking, and seize-barricade situations—in limited periods of time.[26] Similarities between operations of different terrorists also result from familiarity between groups and cross-organization education programs. When terrorists do change tactics, it is often in response to a successful change in counterterrorist tactics. The clearest example of this terrorist–counterterrorist dialectic at work is aircraft hijackings, which declined precipitously after the widespread introduction of more effective airport security systems.[27]

Terrorists tend to be highly deliberate in their use of violent force.[28] They pick their weapons and the time and place of their attacks carefully. They understand that by staging an attack, they will set in motion a sequence of public reactions and governmental responses that may be beyond their capacity to control. Terrorists have only rarely used the maximum amount of deadly force at their disposal. Indeed only 14 incidents conventionally defined as terrorism have resulted in the deaths of more than 100 people (see Table 2). This self-restraint has something to do with the greater technical obstacles and risks associated with more damaging types of attacks, but the principal source of terrorist self-restraint is motivational. Most terrorist violence has been committed by individuals trying not simply to kill people but to achieve some larger aim, and these individuals have most often found great numbers of casualties to be injurious to their larger aims.

Terrorists have historically appreciated the importance of the media to the success of their operations. They regularly take steps to ensure that they receive credit for their actions, sometimes make themselves available for interviews, and occasionally stage their operations in a media-friendly manner. This was especially true of European and Middle Eastern terrorists in the 1970s and 1980s. The number of major terrorist attacks for which no group claimed responsibility rose in the 1990s, however, suggesting a possible shift in terrorist attitudes toward publicity and notoriety. This shift may be the

Table 2
Mass casualty terrorist incidents (100 or more killed)

Year	Event	Deaths
1925	Bombing of cathedral in Sofia, Bulgaria	160
1946	"Avengers" attack on SS officers in Germany	100s (?)
1978	Arson of Rex cinema in Abadan, Iran	477
1983	Bombing of the U.S. Marine barracks in Lebanon	241
1985	Bombing of Air India passenger airliner	328
1987	Bombing of South Korean airliner	117
1987	Car bomb in Sri Lanka bus station	113
1988	Bombing of Pan Am flight 103	278
1989	Bombing of French UTA airliner	171
1989	Bombing of Colombian Avianca aircraft	107
1993	Bombay bombings (10 bombs in less than 3 hours)	235
1995	Bombing of Murrah federal building in Oklahoma City	168
1998	Bombings of U.S. embassies in Tanzania and Kenya	220+
1999	Bombing of apartment building in Moscow	118

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result of the development of more effective national and international counterterrorism practices, which may be increasing the risks perceived by active terrorists.

Terrorism Studies and Counterterrorism Policy

The strongest claim that terrorism studies can make to policy relevance is the insight it can provide into how a specific terrorist organization will behave under a particular set of circumstances. At times this insight will emerge from a prior, detailed analysis of the organization. For example, as Israel and the Palestinian Liberation Organization made rapid progress toward a comprehensive settlement in 1993–95, Israeli terrorism experts were able to predict that the more extreme Palestinian factions (mainly Hamas and the George Habbas group) would step up terrorist attacks against Israel with the objective of influencing Israeli attitudes and disrupting the peace process. More often, however, the policy relevance of terrorism studies derives from the insight they can furnish on the motivations, modus operandi, strategies, tactics, and limitations of terrorist movements in general. Thus, as a result of close study of past terrorism, the importance of the media in most terrorist strategies is now well understood. Governments now actively encourage media outlets, especially the major suppliers of televised news, to handle terrorist incidents responsibly and to avoid becoming the terrorists' unwitting accomplices.[29] Similarly, the study of past terrorist movements has revealed the importance that terrorists attach to their self-definition as combatants in a legitimate political struggle against an unlawful or immoral power. Governments have been able to apply this particular insight to their counterterrorism practices, which in many countries involves treating terrorists as common criminals and deliberately denying them the legitimacy, political status, and special treatment they seek, with the aim of demoralizing active terrorists and dissuading potential terrorists from becoming active. In two other aspects of counterterrorism policy, however, terrorism studies is less useful. These are threat assessment and priority setting.

For the most critical aspect of threat assessment—the tactical warning of impending attacks—the study of past terrorist movements is plainly irrelevant. For the more general function of estimating the most likely type, place, perpetrator, and timing of terrorist attacks, terrorism studies are useful but less so than commonly assumed. There is no reason to believe, for instance, that the sample of terrorist activity available to study is not coterminous with all current or potential terrorist activity at a given time or in a given region. In extreme cases, an over-reliance on the study of past terrorist movements may even reinforce the tendency to assume that the future will resemble the past. An analytic mistake of this kind may increase one's susceptibility to surprise.

Another problem is that threat assessments drawing principally from terrorism studies often generalize about many different terrorist movements even when there is no theoretical reason to believe that the activities or the decisions of these groups will covary. Several authors, for example, have pointed to a rising threat of extreme religious terrorism,[30] but have failed to explain why one should expect a change in the behavior of one member of this amorphous category to echo through the category as a whole. Between 1993 and 1996, four of the most destructive terrorist acts in history were carried out by a Sunni Muslim (Ramzi Yousef and the World Trade Center in New York City), apocalyptic Buddhists (Aum Shinrikyo and the Tokyo subway), a racist Christian (Timothy McVeigh and the Murrah federal building in Oklahoma City), and suspected Shiite Muslims (the bombers of Khobar Towers in Saudi Arabia, possibly affiliated with Osama bin Ladin). In the absence of a compelling theoretical argument for assuming a

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similarity in the internal or external circumstances of these diverse actors, it should be assumed that the link between religious affiliation and a destructive act is coincidental. Furthermore, a conclusion based on this small cluster should certainly not extend to all other actors to whom the appellation "religious terrorist" might be applied.

In counterterrorism, setting priorities is important not just for developing budgets, but also for imposing legal limits on the measures that government security agencies may employ against real and perceived terrorist threats. The strength of terrorism studies lies in its extremely tight analytic focus. As a consequence of this narrow scope, however, terrorism studies provides little if any basis for determining the priority that a government should attach to its counterterrorism program relative to other policy areas. For this, one must consider terrorism in the broader context of other issues deserving a share of scarce government resources.

The point here is not to suggest that terrorism studies has no policy relevance, but to be clear about the types of claims that analysis of past terrorist movements can support. As a particular analytic "lens" on the problem of terrorism, terrorism studies is relevant for developing certain types of counterterrorism policy prescriptions, but is immaterial—if not misleading—for devising other types. As an analysis of the U.S. domestic preparedness program makes clear, policy prescription may have as much to do with the underlying mode of thought and analysis as will the reality of the situation, whatever that may be.

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Terrorism Studies and the U.S. Domestic Preparedness Program

The intellectual origins of the U.S. domestic preparedness program cannot be traced to terrorism studies. For the most part, the subject of WMD terrorism has been at the margins of terrorism studies, largely ignored by most professional terrorism analysts. This historical marginalism of WMD terrorism within the field of terrorism studies is not surprising. The defining characteristic of serious scholarship on terrorism is the study of actual terrorist movements. There has been virtually no evidence of any known terrorist organization's sustained interest in acquiring or using WMD, therefore the subject received minimal scholarly attention (compared to conventional terrorism) until the mid-1990s. Moreover, terrorism studies professionals who have studied WMD terrorism have tended to downplay it: Their prescriptive arguments, while often ambiguous or equivocal, have typically counseled against a major governmental response to the longstanding theoretical possibility of WMD terrorism.[31] The only really clear recommendation of terrorism studies professionals is that U.S. policymakers should stop exaggerating, or "hyping," the threat of WMD terrorism in public. The terrorism experts have two main reasons for this explanation: first, their study of terrorism provides no basis for such extreme threat assessments; but second, they are concerned that excessive attention to the WMD threat will give terrorist groups new ideas and encourage them to experiment with these heretofore disregarded weapons. This recommendation is, however, relatively uncontroversial—even among experts who support the domestic WMD preparedness program—and it does not amount to fundamental criticism of the U.S. policy response.

The rapid growth of the U.S. domestic preparedness budget in the late 1990s, however, *has* attracted the attention of terrorism studies professionals, and the published results of their renewed attention have been skeptical of the need for an expensive domestic preparedness program. The clearest statement of this view comes from Ehud Sprinzak, a terrorism expert based at Hebrew University in Jerusalem, who asserts that,

"as an unprecedented fear of mass-destruction terrorism spreads throughout the American security establishment, governments worldwide are devoting more attention to the threat. But as horrifying as the prospect may be, the relatively low risks of such an event do not justify the high costs now being contemplated to defend against it."[32]

Likewise, several recent analyses of the prospect of chemical and biological weapons terrorism have found insufficient evidence to support a significantly heightened threat assessment and, consequently, take a dim view of large-scale expenditures to prepare for the possibility of an act of chemical or biological terrorism.[33] Researchers at the Monterey Institute of International Studies (MIIS) have been by far the most exhaustive and rigorous in their examinations of the threat of chemical and biological terrorism, developing both a new statistical database and commissioning a dozen detailed case studies of the most widely cited episodes of non-state actor involvement with chemical or biological agents and weapons.[34]

The recent MIIS studies make major contributions to the scholarly literature. In their conclusions regarding the need for a domestic preparedness program as expensive as the one proposed, they tend to be equivocal but generally opposed.[35] Referring to the Clinton administration's fiscal year 2000 budget of $1.4 billion for domestic preparedness, Jonathan Tucker and Amy Sands ask: "Is such a dramatic increase warranted? Not necessarily. In fact, a variety of factors . . . led U.S. officials to overestimate the threat of mass-casualty attacks involving chemical or biological agents. A mid-course correction in U.S. policy is now needed."[36] Separately, Tucker writes with greater specificity that "the potential threat of chemical and biological terrorism is sufficient to warrant an ongoing investigation in improved intelligence collection and civil defense as a prudent insurance policy, but not on the massive scale advocated by some publicists and federal officials."[37] In short, although no dollar figure is named, it seems safe to conclude that the most detailed body of scholarship to address the problem of mass-destruction terrorism gives little support to the expensive U.S. domestic preparedness program, which to date has focused on very high consequence, mass-casualty scenarios.

The researchers at MIIS and elsewhere who study the threat of chemical and biological terrorism do not, however, reject the U.S. domestic preparedness program in its entirety, but rather recommend that it be refocused. Specifically, these researchers conclude that the U.S. government should devote more attention and money to preparing for the types of incidents that have occurred most frequently in the past, such as hoaxes and small-scale contamination. They reason that these types of incidents will occur more frequently in the future than will mass-casualty terrorism attacks involving military-grade biological or chemical weapons, which are the current focus of the U.S. domestic preparedness program. Their view is based on a close examination of past incidents involving chemical or biological weapons agents,[38] as well as on an exhaustive analysis of a database containing 520 documented chemical and biological weapons (CBW) incidents that occurred between 1900 and May 1999, compiled by MIIS.[39] According to Tucker and Sands, 54 percent of these incidents were terrorist cases, while 46 percent were criminal cases. Of the total number of terrorist cases, 263 were sufficiently well documented for MIIS to analyze further. Of these 263 cases, only 27 percent (71 incidents) involved the actual use of a chemical or biological agent, resulting in a global total of 123 deaths, all but one of which occurred outside of the United States.[40] This analysis leads Tucker and Sands to conclude that, "the most likely incidents of chemical and biological terrorism in the future will involve hoaxes and relatively small-scale attacks."[41] The policy prescription they draw from their analysis is that "although some planning for worst-case scenarios is justified, the types of chemical and biological ter-

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rorism against which federal, state, and local planning should be primarily directed are small- to medium-scale attacks. Such a threat assessment is not the stuff of newspaper headlines, but the historical record surely justifies it."[42] Comparable forms of analysis have led other experts to reach similar conclusions.[43]

The analytic model used in the studies described above—"terrorism studies"—is a fundamentally internal mode of analysis. It looks at the specifics of the problem itself, that is, at statistical data on the frequency of similar types of incidents and at case studies of particularly interesting (though not necessarily representative) incidents. Yet, determining whether the United States needs such an expensive program of WMD preparedness, and how it should be focused, is exactly the sort of policy question that internal modes of analysis, such as the terrorism studies analytic model, are ill equipped to answer. Instead, the fundamental issue of broad threat assessment and national priorities requires an "external" form of analysis.

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External Analysis of Terrorism: Risk Management

The distinct external analytic model treats terrorism as one of many risks confronting a state.[44] It involves assessing terrorism in terms of probabilities and consequences, abstract attributes that all problems possess in one way or another, and that can be usefully compared. As a technique for analysis, this model is decidedly different from terrorism studies, which examines only terroristic phenomena and does not seek to compare these phenomena to non-terroristic problems. By shifting analytic models, that is, by conceptualizing terrorism not as the idiosyncratic actions of individuals or groups (internally) but as one risk among many that face society (externally), the U.S. domestic preparedness program is more easily understood.

A Puzzling First Impression

When viewed in the context of all other sources of human death and injury, terrorism is statistically insignificant. Table 3 compares the casualties of international terrorism relative to several other causes of human death and injury, using the admittedly imperfect data on international terrorism supplied by the U.S. Department of State. Clearly, worldwide casualties from terrorism would be higher if the data included domestic terrorism, which kills many more people than does international terrorism. It seems highly unlikely, however, that the number of casualties from domestic and international terrorism would be anywhere close to the number of casualties caused by disease, accidents, and natural disasters.[45]

Annual fatalities from terrorism can be conceived mathematically as a function of the frequency of terrorist incidents and their average lethality. With respect to frequency, acts of international terrorism are so rare that the average person has a negligible chance of ever experiencing one personally. According to the U.S. State Department, 7,388 international terrorist incidents occurred between 1983 and 1998, a global average of 462 per year. The lethality of each incident is extremely low. Indeed, most incidents produced zero casualties. Average fatalities from international terrorism were 390 per year. The terrorist threat is not, of course, evenly distributed around the world. Certain states at certain periods have experienced terrorism more frequently and with higher average lethality than others.[46] Nevertheless, based on the raw empirical evidence, terrorism is statistically insignificant as a source of human suffering. It is, in other words, not much of a risk.[47]

Yet, it is equally clear that as a political and social phenomenon, terrorism is

Table 3
Worldwide fatalities from international terrorism compared to other causes of death (per 100,000)

Year	Terrorism	Meningitis	Car accidents	Suicide	Murder	TB
1983	0.116	—	14.900	12.100	8.30	0.80
1984	0.005	—	15.390	12.420	7.90	0.70
1985	0.016	—	15.150	12.380	8.00	0.70
1986	0.005	—	15.920	12.870	8.60	0.70
1987	0.003	—	19.106	12.710	8.30	0.70
1988	0.078	—	19.218	12.440	8.40	0.80
1989	0.006	—	18.429	12.250	8.70	0.80
1990	0.004	0.30	18.800	11.500	9.40	0.70
1991	0.003	0.30	17.300	11.400	9.80	0.70
1992	0.001	0.20	16.100	11.100	9.30	0.70
1993	0.002	0.30	16.300	11.300	9.50	0.60
1994	0.002	0.30	16.300	11.200	9.00	0.60
1995	0.005	0.20	16.500	11.200	8.20	0.50
1996	0.009	0.30	16.500	10.800	7.40	0.50
1997	0.003	—	15.800	—	6.80	0.40

Sources: U.S. Department of State, Centers for Disease Control and Prevention, World Almanac, <www.disastercenter.com/traffic/AgeGroup>.

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enormously significant, at least in the United States. According to opinion polling done by the Chicago Council on Foreign Relations in 1998–99, 84 percent of the general public identified international terrorism as a "critical threat" to the United States, more than any other issue. Sixty-one percent of "leaders" identified international terrorism as a "critical threat," putting it just behind nuclear proliferation (67 percent) and chemical and biological weapons (64 percent).[48] This view is held by political leaders across the political spectrum. President Clinton made terrorism the centerpiece of his address to the United Nations General Assembly in September 1998, telling the delegates: "It is a grave misconception to see terrorism as only, or even mostly, an American problem. Indeed, it is a clear and present danger to tolerant and open societies and innocent people everywhere. No one in this room, nor the people you represent, are immune."[49]

So, in this respect, terrorism presents a puzzle: The general public and the political leadership tend to perceive the threat of terrorism as a greater problem than the available data would indicate. There are two explanations for this divergence in measured and expressed indices of the severity of the problem of terrorism. First, the full social consequence of any act of terrorism is in fact a high multiple of the number of people injured or killed in the incident.[50] Second, people systematically overestimate both the consequences and the likelihood of terrorism.

Social Magnification of Consequences

The statistics on terrorism capture only its immediate corporal consequences: the number of people killed or injured. The full social consequences of a terrorist act go well

beyond the body count. The wider social impact of an act of terrorism is determined by many factors, not all of which are controlled by the terrorists: where the attack took place; the type and size of the weapons used; the nature of the target; the possibility of a continuing campaign; the effectiveness of the government's response; and the media's portrayal of the threat.

The most important factor driving terrorism's "multiplier effect" is the psychological effect it has on people far removed from the incident itself. Terrorism evokes a sense of horror, indignity, and vulnerability—the last being especially powerful because the victims of terrorism are often innocent civilians who have no specific role in the terrorists' grievances, and with whom the general public easily identifies. The medium through which these effects are transmitted is typically a news source, often television. The media is thus the institution to which terrorism owes most of its disproportionate significance.[51]

The consequences of terrorism, however, are not purely psychological. Long-term repercussions may also include an economic, ecological, diplomatic, or strategic dimension. And they are nearly always political. Prolonged or repeated terrorist incidents, such as an extended hostage or barricade situation, create the impression of governmental apathy or impotence that leaders obviously find extremely unsettling. Governments are charged above all with protecting their citizens—not only against attack but also from living in fear. The power of terrorism has been its ability to create fear beyond the scene of any particular terrorist act. Thus the first explanation for the high level of popular and elite concern over the problem of terrorism is the process by which the immediate physical consequences of a terrorist act are greatly magnified by natural social reactions. As an explanation for the divergence of statistical measures of terrorism from popular and elite attitudes, this is a rational reason: It reflects the awareness, possibly implicit, that terrorist acts cause greater damage to societies than the statistics suggest.

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A More Complete Picture of Terrorism as Risk

Combining an understanding of the social magnification of the consequences of terrorism with conclusions drawn from the terrorism studies literature on the past frequency and patterns of terrorism offers insight into the origin and character of the U.S. domestic preparedness program that terrorism studies cannot offer alone. The U.S. domestic preparedness program makes very little sense from the point of view of terrorism studies, but is much more understandable in a risk management context. The key differences, of course, are the factoring in of potential consequences and the opportunity for comparisons with other risks.

It is readily apparent that terrorism in general is a high-consequence, low-probability risk. Major acts of terrorism rarely happen, but when they do they affect whole societies and command the attention of governments because of the social magnification of consequences. In the broadest comparative terms, terrorist acts are for most nation-states more likely but less damaging than war, yet less likely but more damaging than criminality.

It is also reasonable to assume that the probability and consequences of terrorist acts are inversely related. In other words, we should assume that very high-consequence terrorism (e.g., WMD terrorism) has an even lower probability of occurring than less damaging types of terrorist acts (e.g., conventional bombings). This inverse relationship, depicted in Figure 1, results both from tactical preferences of potential terrorists and

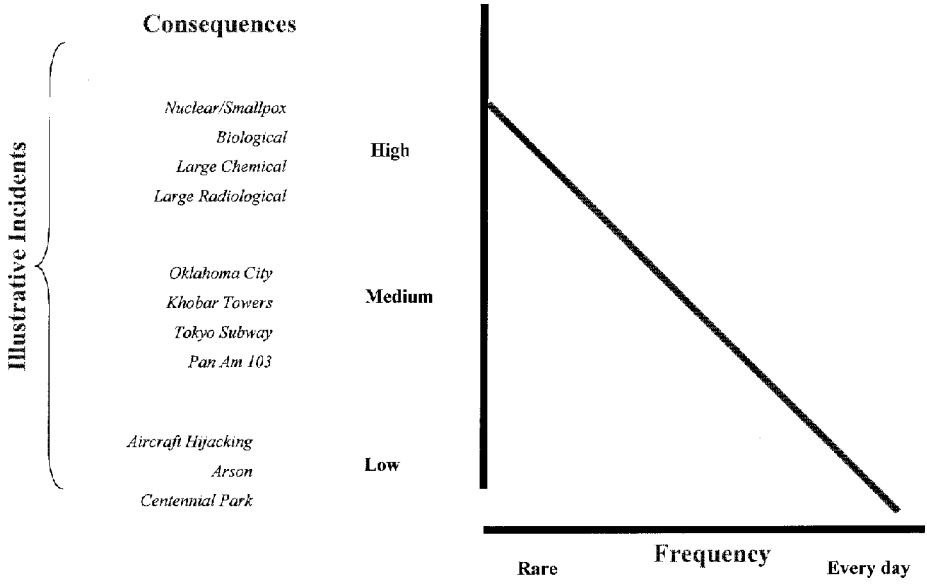

Figure 1. An inverse relationship between severity of consequences and probability.

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their technical capacities. Seen in this perspective, the rationale behind the U.S. domestic preparedness program becomes more understandable, because it need not be based on any specific expectation about the future behavior of terrorists. The U.S. domestic preparedness program reflects, rather, a collective decision to allocate resources toward a particular portion of the threat spectrum that had previously received little attention. This decision was triggered by a relatively small number of high-profile terrorist incidents that suggested an increase in the probability of an act of WMD terrorism, though not a high absolute probability. Because the severity of the terrorist risk is held in check by its low probability, governments are acutely sensitive to perceived increases in the likelihood of terrorist acts.

Changing Risk Perceptions and Policy Innovation

The main contribution of the risk management model is that it facilitates the setting of priorities.[52] It does this in two ways. First, it renders policy problems roughly comparable, either across different types of problems or within a single type of problem over time, by analyzing them in terms of a limited number of common factors. Over time, many experts and officials have concluded that the probability of an act of WMD terrorism is growing. Across policy problems, WMD terrorism appears analogous to the possibility of a limited intercontinental ballistic missile attack against the continental United States, another low-probability but extremely high-consequence threat that the U.S. government takes very seriously.

Second, by pointing toward analogous policy areas, the risk management model suggests rough budgetary benchmarks. An annual budget of $1.4 billion for domestic preparedness is very high in an absolute sense, but in a relative sense, that is, compared to similar or related categories of U.S. expenditure, it is not at all large. The budgetary information presented in Table 4 illustrates this point. Thus, even if one cannot precisely

Table 4
U.S. federal expenditures (in billions of nominal dollars).

	1997	1998	1999	2000	2001
Total Gross Domestic Product	7997	8405	8748	9106	9485
Total Federal Expenditures	1601	1653	1727	1766	1799
National Defense	271	268	277	274	282
Federal administration of justice	20	23	24	28	29
Federal assistance to state and local governments for administration of justice	3	4	4	6	6
Counterterrorism (all federal programs)	—	6.5	8.7	8.4	9.1
Domestic Preparedness Program	—	0.6	1.2	1.4	1.5
National missile defense	—	0.9	1	1.9	1.9

Source: Office of Management and Budget. See <http://w3.access.gpo.gov/usbudget/fy2000/hist.html#h4>.
See also <http://w3.access.gpo.gov/usbudget/fy2000/hist.html#h10>.

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quantify the nature of a risk, one can get a rough sense of whether it deserves more or less attention from the government.

Determining how changing risk perceptions affect policy depends on many factors, but in the case of the U.S. domestic preparedness program, two appear to be particularly important: institutional setting and risk aversion. An important aspect of the origin of the U.S. domestic preparedness program lies with the structure of American government. In the United States, state and local governments have primary responsibility for dealing with domestic criminality, disasters, and emergencies. The federal government becomes involved mainly when the incident is of such scale that the resources of the lower-level agencies are overwhelmed, or when federal law has been violated. Although state and local agencies are generally capable of coping with most low-consequence forms of terrorism, a high-consequence WMD incident would overwhelm their capabilities and necessitate major federal involvement. Moreover, the probability of a WMD terrorist attack is higher when viewed from a federal perspective than it is from the perspective of any particular state or local government. This is because the federal government has jurisdiction over a much larger geographic space than any local or state government, which means that the probability of a WMD terrorist incident within federal jurisdiction is the aggregate likelihood of all the probabilities of such an incident in U.S. states and localities.[53] It is reasonable to expect that governmental bodies with larger areas of responsibility will tend to be more responsive to perceptions of increased risk. These institutional factors help explain why the U.S. domestic preparedness program has focused on the higher portion of the terrorism threat spectrum.

The broad U.S. aversion to national security risks also appears to have played an important role in the origin of the U.S. domestic preparedness program. Social psychological research suggests that there is a great deal of variation in the willingness of individuals and societies to tolerate risk and to invest in risk mitigation. In general, wealthier or more secure societies will tend to be more risk averse than their poorer or less secure counterparts because they are more content with the status quo, have more to lose, and have higher expectations of their governments. Individuals and societies also

tend to be especially averse to risks stemming from the possibility of a deliberate act of aggression by an adversary. Risks that result from accidents, natural phenomena (e.g., hurricanes and disease), or individual choice (e.g., smoking) appear to generate less alarm and lower commitment to prevention and preparedness. This seems to be especially true for nations accustomed to having power and security.

In many respects, the United States is an extraordinarily risk-averse state. It is the most geographically secure and militarily powerful state in history, but even without a major international adversary it still spends roughly 3 percent of its gross national product—$250–$290 billion out of an $8.5 trillion economy—on national defense (see Table 4). The U.S. military is highly conservative in its preferred methods of conducting combat operations, investing heavily in force structure and technologies that minimize the possibility of human casualties. And by the late 1990s, the idea that the United States should build a national missile defense system to guard against the relatively remote risk of intercontinental ballistic missile attack had become almost politically uncontestable. Many factors explain these peculiarities, but a broad aversion to national security risks (as well as the concomitant willingness to spend money to ameliorate these risks) is clearly among them.

In sum, because the risk management model enables comparisons between policy problems over time, it is more useful than the terrorism studies model for the purpose of explaining individual policy prescriptions, especially broad programmatic objectives and the level of resources devoted to achieving a government's objectives.

Problems of Applying Risk Management to National Security Problems

Like the role of terrorism studies in the development of counterterrorism policy, the risk management model is relevant for addressing certain types of policy questions but inappropriate for others. As an analytic lens, the risk management model does not provide great depth of understanding, and hence offers less insight into the inner workings or external strategy of an adversary.

There are several important problems, moreover, with applying risk management to a national security threat such as WMD terrorism. The best risk assessments rely heavily on the quantitative analysis of data. The data on terrorism, however, are not well suited to quantitative analysis for a variety of reasons, many of which are common to other national security problems, such as deterrence failure and surprise attack. First, as already mentioned, the sample set of terrorist groups and incidents on which data are collected is small, biased, and of poor quality.

Second, with respect to the consequences of terrorism, quantifying the values that are threatened by terrorism is highly problematic. One issue that has been debated extensively by economists, philosophers, and litigants is the inability to quantify a human life.[54] Another problem is the difficulty of trying to measure the potential damage to more subtle social values and national interests that terrorism could jeopardize. How does one assign value to citizens' peace of mind; or to the personal privacy allowed by significant restrictions on internal surveillance; or to the willingness of foreign-deployed soldiers to intermingle with the local population; or to the time that travelers spend on airport security checks; or even the ability to drive down Pennsylvania Avenue? Terrorism and counterterrorism affect society in numerous ways, most of which are extremely difficult to quantitatively measure. The problem of gauging the potential consequences of a WMD terrorist incident is especially serious, because the possible physical effects of these weapons can vary enormously but, at one end, are staggeringly high. In con-

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gressional testimony in 1999, Brian Jenkins, a terrorism expert, addressed this issue: "Since risk equals the probability of an event times its consequences, focusing on only the most horrendous events overwhelms any estimate of their likelihood. The possibility of occurrence becomes irrelevant unless the threat can be dismissed with a high degree of confidence—which, of course, it cannot."[55]

There are also multiple challenges to arriving at an absolute measure of the probability of any particular act of terrorism. Most fundamental is the fact that terrorism, like most threats directly caused by humans, is not a random phenomenon. Whether an act of terrorism occurs depends on a decision made by the terrorist. These are strategic decisions typically made through a process of internal deliberation and affected by external stimuli. These decisions may, for example, be negotiable in the sense that they can be influenced by what the opponent (e.g., a government in the case of terrorism) says or does. They may be strategic in the sense of being deliberately nonpatterned, that is, intended to surprise the adversary. This distinguishes national security problems such as terrorism from the traditional subjects of risk assessment—namely, environmental processes, natural disasters, public health problems, and technological accidents. These phenomena are much more likely to conform to a statistical pattern than are strategic phenomena, and are generally non-negotiable.

Most estimates of the probability of an event are based on some understanding of their past frequency. Simple applications of this frequency theory of probability can fail spectacularly when the possible event has occurred only rarely or never at all. The Japanese attack on Pearl Harbor illustrates the problem. To the extent that probability estimates are based on past frequency, the fact that no state had ever before staged such an audacious attack against the U.S. fleet in its most secure Pacific base suggests a probability approaching zero. But the attack did occur. Once it did, earlier estimates of its likelihood became not just wrong but meaningless. Moreover, the attack was the result of a choice made by Japan. The Japanese decided to attack where and when they did because of their own complex strategic calculation and because they thought they could achieve tactical surprise. They were right, in part because of the tendency to think of future probability in terms of past frequency.

Finally, misperception compounds the already extensive problems with the data used in a risk assessment of terrorism. Essentially, even when taking into account the social magnification of terrorism's consequences, people *still* think that the problem of terrorism is worse than it actually is. People overestimate both aspects—probability and consequence—of the risk of terrorism, but the most pervasive and severe form of misperception concerns probability. Misperception has many causes, often categorized as cognitive or institutional: The former refers to misperception that results from the limits of the human mind, whereas the latter is bias that results from the effect of ulterior interests on how information is processed by organizations or individuals.[56]

The literature on the role of cognitive and institutional bias in risk assessment is substantial, and a number of pervasive, systematic types of bias have been identified. One particularly common form is the overestimation of the likelihood of low-probability extreme outcomes.[57] In other words, people tend to believe that extreme outcomes are more likely than they actually are. The manifestations of this phenomenon are as diverse as fear of flying and the demand for lottery tickets. The best explanation for this systematic bias is that people commonly estimate probabilities according to how available (to one's memory) or imaginable the particular outcome is.[58] Rare but high-consequence events, such as a plane crash or winning the lottery, tend to be more extensively reported in the media and more vividly remembered than frequent but low-profile events,

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such as death from lung cancer. These rare, highly visible events therefore tend to be more "available" to memory, and hence their probability is often overestimated. The probability of events that are more easily imaginable is often similarly overestimated: Consider a person's assessment of the risk of being attacked by a shark before and after seeing the movie *Jaws.* This cognitive form of misperception is an extremely serious obstacle to applying the analytic model of risk management to national security threats, which tend to be low-probability extreme outcomes that have readily available or imaginable analogues. This appears to be especially true of the threat of WMD terrorism, which has received increasing attention from the media (see Table 5) and from Hollywood throughout the 1990s—a reasonable indicator for how "available" or "imaginable" an extreme event is.

Thus, there are significant limits to the usefulness of risk management in national security policy. Inadequate data and the strategic, nonpatterned character of national security threats means that they will never generate the rigorous empirical analysis that is the hallmark of the best risk assessment. It is neither sensible nor possible to reduce a genuine national security risk to a simple expected value figure. National security policy analysis is and will remain a highly subjective affair, one in which judgment and the careful weighing of qualitative considerations matter as much or more than quantitative indices. The quantitative techniques of risk management used in other disciplines cannot supplant this more conventional form of national security policy analysis. The basic risk management framework may, however, help organize and structure this analysis, rendering its logic more transparent and generally contributing to clarity of thought.

Conclusion

This article has explored how analytic models can affect positive as well as normative conclusions by examining a recent innovation in the counterterrorism practices of the

Table 5
Media citations

	Frequency of select terms in the media					
	Anthrax	Smallpox	Terrorism	Nuclear	Biological	Chemical
1990	14	13	1275	21	3	15
1991	32	12	1796	60	7	26
1992	12	10	1323	54	1	8
1993	19	29	2234	57	0	16
1994	12	27	1553	61	0	8
1995	20	15	3449	135	25	86
1996	8	11	3079	107	21	66
1997	34	28	2422	48	28	38
1998	152	38	2296	96	76	88
1999	72	44	1933	69	49	54

Source: Numbers gathered from a search of the *New York Times,* the *Boston Globe,* the *Los Angeles Times,* the *Christian Science Monitor,* the *Washington Post,* and a general on-line search of Lexis–Nexis.

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U.S. government—the program of domestic preparedness for weapons of mass destruction terrorism—that has been greeted by great skepticism from most terrorism experts. These experts tend to argue against the domestic preparedness program, and to suggest that it results from some combination of ignorance and ulterior motives among policymakers. This article offers a different explanation—namely, that the domestic preparedness program results from an external mode of analysis that specialists do not often employ, but that policymakers often do, at least implicitly. For lack of a better term, this analytic model has been labeled "risk management," because it treats WMD terrorism as one risk among many facing American society, and evaluates WMD terrorism not only in terms of likelihood but also of potential consequences.

Notes

1. There are several definitions for the term "weapons of mass destruction," but all definitions include nuclear, biological, and chemical weapons. The technologies embedded within each of these weapons are dissimilar, but the three weapon types have in common the potential to produce extremely high casualties (hundreds to hundreds of thousands of fatalities) in a single, relatively small, possibly man-portable device. This distinguishes nuclear, biological, and chemical weapons from other weapon types. For a technical primer on weapons of mass destruction, see Office of Technology Assessment, *Technologies Underlying Weapons of Mass Destruction* (Washington, DC: U.S. Government Printing Office, 1993). As is described later, most of the U.S. domestic preparedness programs are directed mainly against the threat of a terrorist attack involving a chemical or biological weapon.

2. This program is sometimes also referred to as "homeland defense."

3. These offices include the National Domestic Preparedness Consortium (NDPC), National Domestic Preparedness Office (NDPO), Office for State and Local Domestic Preparedness Support (OSLDPS), Hazardous Materials Response Unit (HMRU), Joint Task Force—Civil Support (JTF–CS), WMD Civil Support Teams, Consequence Management Program Integration Office (COMPIO), Domestic Preparedness Program (DPP), Chemical Biological Incident Response Force (CBIRF), Chemical/Biological Quick Response Force (CBQRF), Biological Preparedness and Response Program (BPRP), National Pharmaceutical Stockpile Program (NPSP), National Medical Response Team (NMRT), Metropolitan Medical Response System (MMRS), and Environmental Response Team (ERT).

4. After the United States, the state farthest advanced in its domestic preparation for chemical and biological attacks is Israel. Israel's program is motivated principally by the threat of CBW–armed ballistic missile attack by a nearby adversary (e.g., Iran, Syria, Iraq), rather than by the threat of terrorist use of CBW. It differs from the U.S. program in important respects, as described in Ariel Merari, "Israel's Preparedness for High-Consequence Terrorism," Belfer Center for Science and International Affairs Discussion Paper (BCSIA-2000-30), John F. Kennedy School of Government, Harvard University, September 2000, available at (www.esdp.org).

5. This aspect of the domestic preparedness program overlays the governance challenges familiar to the national security community with the inter-institutional problems of public management more commonly associated with complex domestic programs, which makes it an intriguing program for students of public administration. For further discussion, see Richard A. Falkenrath, "The Problems of Preparedness," *International Security* 25(4) (Spring 2001); and Arnold Howitt and Gregory Koblentz, "Organizational Capacity and Coordination: Obstacles and Opportunities in Preparing for Domestic Terrorism," BCSIA Discussion Paper, forthcoming.

6. On Aum Shinrikyo, see David E. Kaplan, "Aum Shinrikyo (1995)," in *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons,* Jonathan B. Tucker (Cambridge, MA: MIT Press, 2000), pp. 207–226.

7. The more extreme version of this view—that preparedness for WMD terrorism is a conspiracy of the military–industrial complex to maintain the national security apparatus and

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budgets of the Cold War—is plainly overstated and should be dismissed. Examples of such critiques include Flora Lewis, "The New Anti-Terrorism," *New York Review of Books*, 4 February 1999, p. 24; Daniel Greenberg, "The Bioterrorism Panic," *Washington Post*, 16 March 1999, p. A21; and Peter Pringle, "Bioterrorism: America's Newest War Game," *Nation*, 9 November 1998, pp. 11–17. There are also elements of this view in the otherwise carefully argued Ehud Sprinzak, "The Great Superterrorism Scare," *Foreign Policy,* No. 112 (Fall 1998), pp. 110–124.

8. According to Jonathan Tucker and Amy Sands, "instead of examining historical cases in which terrorists sought to acquire and use such agents, the Clinton administration, as well as many outside analysts, developed their threat assessments and response strategies in an empirical vacuum." Jonathan B. Tucker and Amy Sands, "An Unlikely Threat," *Bulletin of Atomic Scientists* 55(4) (July–August 1999), p. 47. According to Ehud Sprinzak, "The threat of superterrorism is likely to make a few defense contractors very rich and a larger number of specialists moderately rich as well as famous." Sprinzak, "The Great Superterrorism Scare," p. 117.

9. David Rapoport, "Terrorism and Weapons of the Apocalypse," *Georgetown National Security Studies Quarterly* (Summer 1999), pp. 49–67.

10. Milton Leitenberg, "Aum Shinrikyo's Efforts to Produce Biological Weapons: A Case Study in the Serial Propogation of Misinformation," *Terrorism and Political Violence* 11(4) (1999), pp. 149–158.

11. The seminal work on the relationship between conceptual models and policy outcomes is Graham T. Allison, *The Essence of Decision: Explaining the Cuban Missile Crisis* (Boston: Little, Brown, 1971).

12. Daniel Kahneman and Amos Tversky, "Intuitive Prediction: Biases and Corrective Procedures," in *Judgment under Uncertainty: Heuristics and Biases*, edited by Daniel Kahneman, Paul Slovic, and Amos Tversky (Cambridge: Cambridge University Press, 1982), p. 415.

13. The ideas of "risk" and "threat" are related but not identical, and both have multiple definitions. As used here, "risk" is the more general concept, encompassing any potential harm. Threat is more specific, referring to potential harm that would result from the deliberate action of one or more human beings. Thus all threats are risks, but not all risks are threats.

14. In scientific studies, risk is often defined as "hazard" multiplied by "exposure." See, for example, Merrie G. Klapp, *Bargaining with Uncertainty* (Westport, CT: Auburn House, 1992), p. 33; and Kahneman, Slovic, and Tversky, *Judgment under Uncertainty*, p. 46. Although not identical, these concepts are closely related to "consequences" and "probability" as used here.

15. For an overview of this literature, see A. M. Babkina, *Terrorism: An Annotated Bibliography* (Commack, NY: Nova Science Publishers, 1998); Edward F. Mickolus, with Susan L. Simmons, *Terrorism, 1992–1995: A Chronology of Events and a Selectively Annotated Bibliography* (Westport, CT: Greenwood Press, 1997); Henry W. Prunckun, *Shadow of Death: An Analytical Bibliography on Political Violence, Terrorism, and Low-Intensity Conflict* (Lanham, MD: Scarecrow Press, 1995); Edward F. Mickolus, *Terrorism, 1988–1991: A Chronology of Events and a Selectively Annotated Bibliography* (Boulder, CO: Westview Press, 1991); and Alex P. Schmid and Albert J. Jongman, *Political Terrorism: A New Guide to Actors, Authors, Concepts, Data Bases, Theories, and Literatures* (New Brunswick, NJ: Transaction Books, 1988).

16. For a survey of different approaches to defining terrorism, see Bruce Hoffman, *Inside Terrorism* (New York: Columbia University Press, 1998), pp. 13–44; Paul Wilkinson, *Terrorism and the Liberal State*, 2d ed. (New York: New York University Press, 1986), pp. 50–68; Richard Thackrah, "Terrorism: A Definitional Problem," in *Contemporary Research on Terrorism,* edited by Paul Wilkinson and Alasdair M. Stewart (Aberdeen, Scotland: Aberdeen University Press, 1987), pp. 24–41; and Brian Jenkins, *The Study of Terror: Definitional Problems* (Santa Monica, CA: RAND, 1980).

17. These include the U.S. Department of State; the Jaffee Center for Stategic Studies in Tel Aviv; the RAND Corporation (which became a shared asset of the University of St. Andrews in 1994); Ed Mickolus; and, recently, the Monterey Institute of International Studies. For an overview of these databases (not including the Monterey Institute), see A. J. Jongman, "Trends in International and Domestic Terrorism in Western Europe, 1968–88," in *Western Responses to*

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Terrorism, edited by Alex P. Schmid and Ronald D. Crelinsten (London: Frank Cass, 1993), pp. 26–76. For a discussion of the Monterey database, see Jonathan B. Tucker, "Historical Trends Related to Bioterrorism: An Empirical Analysis," *Emerging Infectious Disease* 5(4) (July–August 1999), pp. 498–504.

18. On the problems of terrorism statistics, see Jongman, "Trends in International and Domestic Terrorism," and Brian M. Jenkins, "Terrorism-Prone Countries and Conditions," in *On Terrorism and Combating Terrorism,* edited by Ariel Merari (Frederick, MD: University Publications of America, 1985), pp. 25–28.

19. See Jongman, "Trends in International and Domestic Terrorism," pp. 29–32.

20. Governments often withhold information on what they define as domestic terrorism, because it is regarded as an internal matter that raises unwelcome questions about governmental control and legitimacy. See ibid., pp. 45–46.

21. This is also true of the RAND–St. Andrews database.

22. Thomas C. Schelling, "What Purposes Can 'International Terrorism' Serve?" in *Violence, Terrorism, and Justice,* edited by R. G. Frey and Christopher W. Morris (Cambridge: Cambridge University Press, 1991), p. 21. See also Walter Laqueur, "The Futility of Terrorism," in *International Terrorism: Characteristics, Causes, Controls,* edited by Charles W. Kegley, Jr. (New York: St. Martin's Press, 1990), pp. 69–73. Some terrorist movements do, of course, achieve various short-term objectives, such as attracting recruits, maintaining group cohesion, and generating publicity.

23. Martha Crenshaw, "An Organizational Approach to the Analysis of Political Terrorism," *Orbis* 29(3) (Fall 1985), pp. 473–487. In developing this argument, Crenshaw draws on the work of James Q. Wilson, *Political Organization* (New York: Basic Books, 1973). See also Walter Laqueur, *The Age of Terrorism* (Boston: Little, Brown, 1987), pp. 93–96.

24. Ariel Merari, "Terrorism as a Strategy of Struggle: Past and Future," *Terrorism and Political Violence* 11(4) (Summer 2000), pp. 52–65.

25. See Bruce Hoffman, "Terrorist Targeting," *Terrorism and Political Violence* 5(2) (Summer 1993), pp. 12–29; and Bruce Hoffman, "Responding to Terrorism across the Technological Spectrum," *Terrorism and Political Violence* 6(3) (Autumn 1994), pp. 366–390.

26. See Hoffman, *Inside Terrorism*, pp. 77–80, p. 167; and Jeffrey D. Simon, "Terrorists and the Potential Use of Biological Weapons: A Discussion of Possibilities," Rand Corporation Report (December 1989), pp. 13–14.

27. Peter St. John, *Air Piracy, Airport Security, and International Terrorism: Winning the War against Hijackers* (New York: Quorum Books, 1991).

28. Brian M. Jenkins, *International Terrorism: The Other World War*, RAND Report R-3302-AF (November 1985); Brian M. Jenkins, "Will Terrorists Go Nuclear?" RAND Report P-5541 (November 1975); Hoffman, "Terrorist Targeting"; Laqueur, *The Age of Terrorism,* pp. 312–321; and Martha Crenshaw, "Transnational Terrorism and World Politics," *Jerusalem Journal of International Relations* 1(2) (Winter 1975), pp. 109–129.

29. The media's handling of major terrorist incidents in the 1980s, most notably the 1985 hijacking of TWA flight 847, was strongly criticized. On the issue of terrorism and the media, see Brigitte L. Nacos, *Terrorism and the Media: From the Iran Hostage Crisis to the Oklahoma City Bombing* (New York: Columbia University Press, 1996); Hoffman, *Inside Terrorism*, pp. 131–142; and Laqueur, *The Age of Terrorism*, pp. 121–127.

30. See Mark Jurgensmeyer, *Terror in the Mind of God: The Global Rise of Religious Violence* (Los Angeles: University of California Press, 1999); Jessica Stern, *The Ultimate Terrorists* (Cambridge, MA: Harvard University Press, 1999); and Bruce Hoffman, "Old Madness, New Method: Revival of Religious Terrorism Begs for Broader U.S. Policy" at (http://www.rand.org/publications/RRR/RANDRev.winter98.9/methods.html).

31. The principal exception appears to be Walter Laqueur. See his "Postmodern Terrorism," *Foreign Affairs* 15(5) (September–October 1996), pp. 24–36; and "The New Face of Terror," *Washington Quarterly* 21(4) (Autumn 1998), pp. 169–-178.

32. Ehud Sprinzak, "The Great Superterrorism Scare," p. 110. See also David Claridge,

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"Exploding the Myth of Superterrorism," *Terrorism and Political Violence* 11(4) (Summer 2000), pp. 133–148.

33. Most of the recent analysis of terrorism and weapons of mass destruction has been carried out by people who have focused their research mainly on the latter topic. The principal exceptions (i.e., terrorism specialists who have examined the question of WMD terrorism) are Jerrold Post, David Rapoport, Brian Jenkins, Walter Laqueur, Bruce Hoffman, and Gavin Cameron.

34. See Tucker, *Toxic Terror;* Tucker, "Historical Trends Related to Bioterrorism"; Tucker and Sands, "An Unlikely Threat," pp. 46–52; John V. Parachini, "Combating Terrorism: Assessing the Threat," statement before the House Subcommittee on National Security, Veterans Affairs, and International Relations, 106th Session of Congress, 20 October 1999, at (http://cns.miis.edu/pubs/reports/parach.htm); and Jonathan B. Tucker, "Chemical and Biological Terrorism: How Real a Threat?" *Current History* (April 2000), pp. 147–153.

35. One policy issue on which virtually all recent analyses of WMD terrorism concur is that government officials and media commentators should moderate their public descriptions of the threat. This issue, however, is only indirectly related to the issue of the advisability of the U.S. domestic preparedness program.

36. Tucker and Sands, "An Unlikely Threat," p. 46.

37. Tucker, "Chemical and Biological Terrorism," p. 152.

38. See Tucker, *Toxic Terror*. See also John V. Parachini, "Combating Terrorism"; Tucker "Chemical and Biological Terrorism"; and Tucker and Sands, "An Unlikely Threat."

39. Tucker and Sands, "An Unlikely Threat," pp. 47–48. MIIS broadly defines the term "incident" to include hoaxes, plots, attempted acquisition of a chemical or biological agent (i.e., not necessarily a weapon), actual possession of a CBW agent or weapons, individual poisonings, mass poisonings and contamination, and use of chemical or biological weapons.

40. Ibid., p. 48.

41. Ibid., p. 52.

42. Ibid.

43. Proponents of this idea include Parachini, "Combating Terrorism"; Sprinzak, "The Great Superterrorism Scare"; Joseph Pilat, "WMD Terrorism: An Exchange," *Survival* 40(4) (Winter 1998–99), pp. 171–175; and the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction ("the Gilmore Commission"), "First Annual Report to the President and the Congress: Assessing the Threat," 15 December 1999.

44. I use the term "distinct" rather than "alternative" because analytic models need not be intellectually exclusive, though in practice they often are.

45. This would probably not be true, however, if included among casualties from domestic terrorism were casualties from civil war and international conflict.

46. Travel warnings are issued when the State Department recommends that Americans avoid a certain country. The following countries were on this list in mid-2000: Afghanistan, Albania, Algeria, Angola, Bosnia and Herzegovina, Burundi, Central African Republic, Republic of Congo, Colombia, Democratic Republic of Congo, Fiji, Guinea Bissau, Iran, Iraq, Lebanon, Liberia, Libya, Nigeria, Pakistan, Serbia-Montenegro, Sierra Leone, Solomon Islands, Somalia, Sudan, Tajikistan, and Yemen.

47. This point is cogently expressed in an editorial by Mark Helprin, "Terrorism in the New Century," *The Wall Street Journal*, 19 September 2000.

48. John E. Rielly, *American Public Opinion and U.S. Foreign Policy, 1999* (Chicago: Chicago Council on Foreign Relations, 1999), p. 15, at (www.ccfr.org).

49. William J. Clinton, address to Fifty-third UN General Assembly, 21 September 1998, at (http://usinfo.state.gov/topical/pol/usandun/clinun.htm).

50. For a more complete discussion of the social magnification of risk see Roger E. Kasperson, "The Social Amplification of Risk: A Conceptual Framework," *Risk Analysis* 8(2) (June 1988), pp. 177–191. See also Roger E. Kasperson and Jeanne X. Kasperson, "The Social Amplification and Attenuation of Risk," *Annals of the American Academy* No. 545 (May 1996), pp. 95–105.

51. See Hoffman, *Inside Terrorism*, pp. 131–148.

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52. For an example of this logic at work in a broad discussion of U.S. national security policy, see Robert J. Art, "Geopolitics Updated: The Strategy of Selective Engagement," *International Security* 23(3) (Winter 1998/99), pp. 84–89.

53. For an in-depth discussion, see Howitt and Koblentz, "Organizational Capacity and Coordination."

54. On the debate over the value of human life, see M. W. Jones-Lee, *The Value of Life and Safety*, proceedings of a conference held by the Geneva Association (Amsterdam: Elsevier Science Publishers, 1982).

55. Testimony of Brian Michael Jenkins before the Subcommittee on National Security, Veteran Affairs, and International Relations, House Committee on Government Reform, 106th Session of Congress, 20 October 1999.

56. See Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976), pp. 172–202 and 211–215.

57. See Paul Slovic, Baruch Fischoff, and Sarah Lichtenstein, "Facts versus Fiction: Understanding Public Fears," in Kahneman, Slovic, and Tversky, *Judgment under Uncertainty*, pp. 463–491.

58. These techniques for estimating probabilities are termed "heuristics" by the risk assessment literature. See Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases," pp. 3–20; and "Availability: A Heuristic for Judging Frequency and Probability," in Kahneman, Slovic, and Tversky, *Judgment under Uncertainty,* pp. 163–178.

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