Terrorism, Personal Security, and Responsible Policy Making

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As declared in the first sentence of the American constitution and throughout the work of Thomas Hobbes, a key reason for founding governments is to "ensure domestic Tranquility." Accordingly, officials serving the public are tasked at the most fundamental level to provide personal security—to expend funds in a manner that most effectively and efficiently keeps people safe.

Doing so is neither easy nor precise, and the funds available for this purpose are, of course, limited. Moreover, there are inevitably distortions stemming from public and personal emotion and from political pressures. However, while allowing emotion to overwhelm sensible analysis is both understandable and common among ordinary people, it is not appropriate for officials charged with—responsible for—keeping them safe. To the degree possible, the task should be carried out systematically and professionally. To do otherwise, is irresponsible, a profound betrayal of the public trust,

and, because human lives are at stake, immoral.

Terrorism is a hazard to human life, and it should be dealt with in a manner similar to that applied to other hazards—albeit with an appreciation for the fact that terrorism often evokes extraordinary fear and anxiety.

The public opinion context: persistent anxiety

In his assessment of the reaction to the September 11 attacks, anthropologist Scott Atran muses, "Perhaps never in the history of human conflict have so few people with so few actual means and capabilities frightened so many."[1] Figure 1 suggests that this extraordinarily exaggerated response has generally persisted. Some 35 to 40 percent of the American people has continued since late 2001 to profess worry—even in the aftermath of the death of Osama binLaden—that they or a family member might become a victim of terrorism.

This is a startling phenomenon given that there has been no really sizable terrorist attack in the country (and the largest one that has occurred, the killing of thirteen at Fort Hood in 2009, scarcely stoked wide alarm), that the last sizable attack in the developed world occurred nearly a decade ago in London, and that an American's chance of being killed by a terrorist is, as will be discussed further later, about one in 3.5 million per year.

The American public has come to pay less attention to terrorism, as other concerns—the wars in the Middle East and, more lately, the economy—have dominated its responses to questions about the most important problem facing the country.

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[1] Scott Atran, *Talking to the Enemy: Faith, Brotherhood, and the (Un)making of Terrorists* (New

However, polling trends on questions specifically about terrorism generally conform to the pattern found in Figure 1. For example, estimates of the likelihood of "another terrorist attack causing large numbers of Americans to be lost" stood a few months after bin Laden's death in 2011 at essentially the same level as in 2001, with more than 70 percent of respondents deeming such a dire event to be very or somewhat likely. The same holds for a question about which side was winning the war against terrorism.[2]

These persistent anxieties stem in part from the peculiar trauma of the September 11 attacks themselves, and they have proven to have had a lasting impact on perceptions. Reinforcing the unease may be the anthrax letter attacks that followed shortly after September 11 and perhaps also to two other events: an airliner crash (unrelated to terrorism) in New York on November 12 and the failed effort of the shoe bomber on December 22. Anxiety may also derive from the perception that, unlike terrorists who seem mainly out to draw attention to their cause, Islamist extremist terrorists seem to be out to kill as many people as possible. Fear has been notably maintained as well by the popularity and the often knee-jerk acceptance of the highly questionable notion that terrorists will eventually (or even soon) acquire weapons that can kill in massive numbers and then detonate them in an American city.[3]

York: Ecco, 2010), xiv.

[2] Poll trends on terrorism are posted at http://polisci.osu.edu/faculty/jmueller/terrorpolls.pdf.

[3] For a study concluding that the likelihood a terrorist group will be able to detonate an atomic weapon—particularly within the United States—is vanishingly small, see John Mueller, *Atomic Obsession: Nuclear Alarmism from Hiroshima to Al Qaeda* (New York: Oxford University Press, 2010), chs. 12-15. For a decidedly different perspective on this, see Graham T. Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe* (New York: Times Books, 2004).

In addition, U.S. government officials have maintained their ability to stoke fear. Even as it was announced by counterterrorism officials in 2010 that the "likelihood of a large-scale organized attack" has been reduced, Department of Homeland Security Secretary Janet Napolitano was explaining that this means that al-Qaeda franchises are now able "to innovate on their own" (presumably developing small-scale disorganized attacks), with the result that the threat "in some ways" is now the highest it has been since September 11. A senior Obama administration analyst implies that the situation is as bad as ever: al-Qaeda "lacks the ability to plan, organize and execute complex, catastrophic attacks, but the threat persists."[4]

In addition, officials have shifted their focus to "homegrown" terrorism with some success, even though this reflects not so much the rise of local would-be terrorists as the abandonment, or the discrediting, of the once-accepted notion that large numbers of non-homegrown terrorists are abroad in the land.[5] Moreover, foiled plots can seem, or be made to seem, scarier than successful ones because the emphasis is on what the

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[4] On Napolitano, see Richard A. Serrano, "U.S. Faces 'Heightened' Threat Level," *Los Angeles Times,* February 10, 2011; on the senior official, see David Ignatius, "The bin Laden Plot to Kill President Obama," *Washington Post,* March 16, 2012. See also Mitchell D. Silber, "The Mutating al Qaeda Threat: Terrorists Are Adapting and Expanding," *Washington Times,* December 30, 2011. For commentary on the phenomenon, see Heather Mac Donald, "The Ever-Renewing Terror Threat," *Secular Right,* February 13, 2011, http://secularright.org; Brooks, "Muslim 'Homegrown' Terrorism in the United States," 43–44; and John Mueller, "Why al Qaeda May Never Die," *Skeptics* blog, May 1, 2012, http://nationalinterest.org.
[5] Bill Gertz, "5,000 in U.S. Suspected of Ties to al Qaeda; Groups Nationwide Under Surveillance," *Washington Times,* July 11, 2002. Richard Sale, "US al Qaida Cells Attacked," UPI, October 31, 2002.

terrorist plotters hoped to do or might have been able to do, not with what they were

likely to do.[6]

Howeve, official alarmism has actually tapered off in recent years, and

predictions that the country must brace itself for a large imminent attack, so common in

the first several years after September 11, are rarely heard.[7] Anxiety about terrorism,

then, seems substantially to be a bottom-up phenomenon rather than one inspired by

policymakers, risk entrepreneurs, politicians, and members of the media, who seem

more nearly to be responding to the fears (and exacerbating them) than creating them.

Responding to the anxiety

Thus, Americans seem to have internalized their anxiety about terrorism, and

politicians and policymakers have come to believe that they can defy it only at their own

peril. Concern about appearing to be soft on terrorism has replaced concern about

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[6] Thus, when terrorists in 2009 were foiled in their plot to detonate four suicide bombs on the New York subway, various experts (including the attorney general of the United States) opined that the attack, if successful, might have killed between 200 and 500 people. Tom Hays, "Feds: Terror Suspects' Mingling Fed NYC threat," *KIDK.com,* September 26, 2009; and "Justice Department Oversight—Part 1—Newsflash," Associated Press, April 14, 2010. This estimate ignored the experience in July 2005 when two sets of terrorists each attempted to set off four bombs on the crowded transit system in London. The first set killed 52, while the second killed none because the bombs were ill constructed. Presumably, the London bombers could have killed more if, in the first case, the bombs had been placed differently or, in the second, if they had been constructed properly. But because the number of dead is known, it is that number, not an imagined one, that ought to be the initial basis of comparison. There were also extravagant death tallies imagined for the foiled transatlantic airliner plot of 2006 and for the amazingly inept would-be Times Square bomber of 2010. On these issues, see also John Mueller and Mark G. Stewart, "The Terrorism Delusion: America's Overwrought Response to September 11, *International Security*, 37(1) Summer 2012: 81-110.
[7] For an array of such predictions, see http://polisci.osu.edu/faculty/jmueller/PREDICT.PDF.

seeming to be soft on communism, a phenomenon that lasted far longer than the

dramatic episodes that generated it.[8]

American policymakers have certainly responded to this condition. Since 9/11,

the *increase* of spending on domestic homeland security (ignoring expenditures abroad

including the wars in Iraq and Afghanistan) has totalled over $1 trillion.[9] However, to the

degree that these measures have been designed to promote and preserve

psychological security and to allay public anxiety —central concerns of this book—they

clearly have failed miserably. Not only, as Figure 1 suggests, has there been little in the

way of a decline of professed worry about being killed by terrorist since late 2001, but,

as Figures 2 and 3 demonstrate, there has been, if anything, an increase during the

same period in the percentage of people who say they feel less safe than before 9/11

and a decrease in the percentage who have confidence in the government's ability to

protect citizens from future acts of terrorism.

Since the many expensive, ad hoc, and hasty measures adopted to deal with (or

thrown at) the problem since 9/11 have not allayed concerns about personal security,

officials, in some sense, are free to do it right.

Risk analysis is an aid to rational decision making that has been developed,

codified, and applied over the last few decades—or in some respects centuries.[10] We

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[8] John Mueller and Mark G. Stewart, *Terror, Security, and Money: Balancing the Risks, Benefits, and Costs of Homeland Security* (New York and Oxford, UK: Oxford University Press, 2011), 185–188.

[9] Mueller and Stewart, *Terror, Security, and Money,* ch. 1.

[10] See, for example, ISO 31000–2009, *Risk Management—Principles and Guidelines*, Geneva, Switzerland, 2009. Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk* (New York: John Wiley & Sons, 1996).

here deal with four issues central to this approach, applying them to the hazard presented by terrorism: the cost per saved life, acceptable risk, cost-benefit analysis, and risk communication. We conclude with an assessment of the degree to which risk analysis has been coherently applied to counterterrorism efforts by the government—particularly by the U.S. government—in making or evaluating decisions that have cost taxpayers hundreds of billions of dollars over the last dozen years.

Cost per saved life

When regulators propose a new rule or regulation to enhance safety, they are routinely required to estimate how much it will cost under their proposal to save a single life. Table 1 supplies information about how this calculation comes out for dozens of government rules and regulations in the United States.

The results are anything but tidy, and they often reflect psychological and political aspects of risk perception or electoral and lobbyist pressure. However, some general tendencies and limits have been established over time. Thus, looking over such data, Elizabeth Paté-Cornell suggests that a ceiling of $3 million per life saved, inflation adjusted to 2010 dollars, seems roughly appropriate in current practice—though there are a number of entries in the table that are substantially, even spectacularly, higher.[11] But in general, regulators and administrators begin to become unwilling to spend more than $1 million to save a life, and they are quite reluctant to spend over $10 million, preferring instead to expend funds on measures that save lives at a lower cost.

This approach can be, and has been, expanded to embrace deaths by terrorism.

Following the widely applied approach, a study for the Department of Homeland

Security by Lisa Robinson and her colleagues concludes that the best estimate of a

value of a saved human life for homeland security analysis would be about $7 million in

2013 dollars.[12] Most studies focus on relatively common risks such as workplace or

motor vehicle accidents, and the Robinson study goes on to suggest that "more

involuntary, uncontrollable, and dread risks may be assigned a value that is perhaps

twice that of more familiar risks" or some $14 million. This approach essentially adds

into the analysis much of the substantial indirect and ancillary costs, including emotional

ones, associated with a terrorist event.

The United States spends about $100 billion per year on seeking to deter,

disrupt, or protect against domestic counterterrorism. If each saved life is valued at $14

million, it would be necessary for the measures to be justified, they would have to

prevent or protect against between 6000 and 7000 terrorism deaths in the county each

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[11] M. Elisabeth Paté-Cornell, "Quantitative Safety Goals for Risk Management of Industrial Facilities," *Structural Safety* 13, 1994: 145–157.

[12] Lisa A. Robinson, James K. Hammitt, Joseph E. Aldy, Alan Krupnick, and Jennifer Baxter, "Valuing the Risk of Death from Terrorist Attacks," *Journal of Homeland Security and Emergency Management* 7(1), 2010. Characteristically, court awards or compensation payouts are considerably lower. The average life insurance payout to 9/11 victims was $350,000, and workers compensation was $400,000. Lloyd Dixon and Rachel K. Stern, *Compensation for Losses from the 9/11 Attacks* (Santa Monica, CA: RAND Institute for Civil Justice, 2004), 31, 17. Court awards may be higher than this, but not always. A study of aviation fatality payments found that the average compensation for cases that went to trial was approximately $1.2 million with a maximum of $10 million in 2010 dollars; however, half of all payouts, including those settled before trials began, were less than $350,000. James S. Kakalik, Elizabeth M. King, Michael Traynor, Patricia A. Ebner, and Larry Picus, *Costs and Compensation Paid in Aviation Accident Litigation* (Santa Monica, CA: RAND Institute for Civil Justice, 1988), x. Payments to the families of soldiers killed in the Iraq War total $500,000, up from $112,240 before that conflict. Joseph E. Stiglitz and Linda J. Bilmes, *The Three Trillion Dollar War: The True Cost of the Iraq Conflict* (New York: W. W. Norton, 2008), 17.

year, or twice that if the lower figure of $7 million for a saved life is applied.

These figures, to say the very least, seem to be very high. The total number of

people killed by Islamist extremist terrorists within the United States since 9/11 is 19, or

less than two per year, a far cry, of course, from 6000 to 7000 per year.[13] A defender of

the spending might argue that the number is that low primarily because of the

counterterrorism efforts. Others might be more skeptical.

Acceptable risk

Another way to approach the issue is to compare the annual fatality rates caused

by terrorism with those caused by other hazards. Table 2 provides relevant information.

It leads to a consideration of the central analytic issue of acceptable risk. Is the

likelihood of being killed by the hazard unacceptably high, or is it low enough to be

acceptable? That is, just how safe is safe enough? When does a risk become

acceptable?

We often say that there is nothing more important than the value of human life.

Yet, obviously, we don't really believe this: Americans are clearly willing to sacrifice tens

of thousands of lives per year to have the automobile even though it is quite possible to

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[13] A useful comparison might be made with the Los Angeles Police Department which operates with a yearly budget of $1.2 billion. Considering only lives saved following the discussion above, that expenditure would be justified if the police every year saved some 170 lives when each saved life is valued at $7 million. At present there are some 300 homicides each year in the city and about the same number of deaths in automobile accidents. It is certainly plausible to suggest that both of those numbers would be substantially higher without police efforts and accordingly that local taxpayers are getting pretty good value for their money. Moreover, the police provide a great many other services to the community for the same expenditure, from directing traffic to arresting burglars and shoplifters. Although, efforts to police terrorism also provide such co-benefits, they are likely to be quite a bit lower than those provided by the Los Angeles police.

move people without killing them: passengers killed on railroads in a year can often be

numbered on the fingers of one hand. Many other social policies involve the same sort

of consideration. To take an extreme example, every year a few thousand people in the

United States die in falls from buildings that are more than one story high. Those lives

could be saved by closing off all buildings at the ground floor. To reject such a policy is

to say tall buildings are worth that cost in lives. As a society, then, we regularly and

inescapably adopt policies in which human lives are part of the price.

A review of 132 U.S. federal government regulatory decisions associated with

public exposure to environmental carcinogens found that regulatory action never

occurred if the individual annual fatality risk was lower than 1 in 700,000.[14] Established

regulatory practices in several developed countries are similar. In general, risks are

deemed unacceptable if the annual fatality risk is higher than 1 in 10,000 or perhaps

higher than 1 in 100,000. They are deemed acceptable if the annual fatality risk is lower

than 1 in 700,000 or perhaps 1 in 1 million or 1 in 2 million. Between these two regions

is an area that might be considered tolerable risk.

These considerations, substantially accepted for years, even decades, by public

regulatory agencies after extensive evaluation and considerable debate and public

discussion, are designed to provide a viable, if somewhat rough, guideline for public

policy. Clearly, hazards that fall in the unacceptable range (traffic accidents, for

example) should generally command the most attention and the most resources. Those

[14] C. C. Travis, S. A. Richter, E. A. C. Crouch, R. Wilson, and E. D. Klema, "Cancer Risk Management: A Review of 132 Federal Regulatory Decisions," *Environmental Science and Technology* 21(5) 1987: 415–420.

in the tolerable range may also be worthy of consideration, though obviously the urgency is less, and only relatively inexpensive measures to further reduce the risk should be pursued. Those hazards in the acceptable range (drowning in bathtubs, for example) would generally be deemed of little or even negligible concern—they are risks we can live with—and further precautions would scarcely be worth pursuing unless they are quite remarkably inexpensive.

Overall, then, it is clear that governments have been able to set, and agree upon, risk acceptance criteria for use in decision making for a wide variety of hazards, including ones that, like terrorism, are highly controversial and emotive such as pollution, nuclear and chemical power plant accidents, and public exposure to nuclear radiation and environmental carcinogens.

As can be seen in Table 2, almost all annual terrorism fatality risks are less than 1 in a million—for the United States, Great Britain, Canada, and Australia, they are less than 1 in 3.5 million per year. Therefore they generally lie within the range deemed by regulators internationally to be safe or acceptable and do not require further regulation.[15] Applying conventional standards, then, terrorism currently presents a threat to human life in the Western world that is, in general, acceptable, and efforts, particularly expensive ones, to further reduce its likelihood or consequences are scarcely justified.

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[15] See also Kenneth T. Bogen and Edwin D. Jones, "Risks of Mortality and Morbidity from Worldwide Terrorism: 1968–2004," *Risk Analysis* 26(1) 2006: 56; Daniel Gardner, *The Science of Fear: Why We Fear the Things We Shouldn't—and Put Ourselves in Greater Danger* (New York: Dutton. 2008), 250–251.

It is possible that any relaxation in security measures will increase the terrorism

hazard risk. However, for the terrorism risk to border on becoming unacceptable by

established risk conventions—that is, to reach an annual fatality rate of 1 in 100,000—

the number of fatalities from all forms of terrorism in the United States and Canada

would have to increase 35-fold, in Britain (excluding Northern Ireland) more than 50-

fold, and in Australia more than 70-fold.

We have been using historical data on terrorism here, and there is, of course, no

guarantee that the frequencies of the past will necessarily persist into the future.

However, there seems to be little evidence terrorists are becoming any more

destructive, particularly in the West. In fact, if anything, there seems to be a diminishing,

not expanding, level of terrorist activity and destruction at least outside of war zones.

Those who wish to discount such arguments and projections need to demonstrate why

they think terrorists will suddenly get their act together and inflict massively increased

violence, visiting savage discontinuities on the historical data series.[16]

Cost-benefit analysis

Cost-benefit analysis brings this all together. A conventional approach to cost-

effectiveness compares the costs of a security measure with its benefits as tallied in

lives saved and damages averted. The benefit of a security measure is a multiplicative

composite of three considerations. For the terrorism hazard, these are the probability of

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[16] For some recent, albeit evidence-free, declarations that terrorists might able to do so, see
Thomas L. Friedman, "Blowing a Whistle," *New York Times*, June 11, 2013; Jeffrey Goldberg,
"What Conor Friedersdorf Misunderstands About Terrorism," bloomberg.com, June 12, 2013.

a successful attack absent the security measure, the losses sustained in a successful

attack, and the reduction in risk furnished by the security measure.

benefit = (probability of a successful attack) × (losses sustained in the attack) ×

(reduction in risk)

      The interaction of these variables can perhaps be seen in an example. Suppose

there is a dangerous curve on a road that results in an accident from time to time. To

evaluate measures designed to deal with this problem, the analyst would need to

estimate 1) the probability of an accident each year under present conditions, 2) the

consequences of the accident (death, injury, property damage), and 3) the degree to

which a proposed safety measure lowers the probability of an accident (erecting

warning signs) and/or the losses sustained in the accident (erecting a crash barrier). If

the benefit of the risk-reduction measure—these three items multiplied together—

outweighs its cost, the measure would be deemed to be cost-effective.

      These considerations can be usefully wrinkled around a bit in a procedure known

as "break-even analysis." In this, one seeks to determine what the probability of an

otherwise successful terrorist attack would have to be for a security measure to begin to

justify its cost. Thus, we set the cost of the measure equal to its benefit:

cost = (probability of a successful attack) × (losses sustained in the attack) × (reduction

in risk)

which becomes

(probability of a successful attack) = (cost) / [(losses sustained in the attack) ×

(reduction in risk)]

We have applied this approach to the overall increase in domestic homeland

security spending in the United States by the federal government (including for national

intelligence) and by state and local governments. That is, we assume homeland security

measures in place before the 9/11 attacks continue, and we evaluate the cost

effectiveness of the additional funds that have been allocated to homeland security. By

2009, this increase totaled some $75 billion per year. This is a very conservative

measure of the degree to which homeland security expenditures have risen since 9/11

because it excludes such items as private sector expenditures, hidden and indirect

costs of implementing security-related regulations, and the costs of the terror-related (or

terror-impelled) wars in Iraq and Afghanistan.

In assessing risk reduction, it is important assess the risk-reduction effectiveness

of homeland security measures that were in place before 9/11. In addition, it should be

kept in mind that the tragic events of 9/11 massively heightened the awareness of the

public to the threat of terrorism, resulting in extra vigilance that has often resulted in the

arrest of terrorists or the foiling of terrorist attempts at little of no cost to the government.

In our analysis, we assume that risk reduction caused by the security measures in place

before 9/11 and by the extra vigilance of the public after that event together reduced risk

by 50 percent. This is a conservative estimate because security measures that are at

once effective and relatively inexpensive are generally the first to be implemented—for

example, one erects warning signs on a potentially dangerous curve in the road before

rebuilding the highway. Furthermore, most terrorists (or would-be terrorists) do not show

much intelligence, cleverness, resourcefulness, or initiative.[17] Therefore measures to

deal with them are relatively inexpensive and are likely to be instituted first. Dealing with

the smarter and more capable terrorists is more difficult and expensive, but these

people represent, it certainly appears, a decided minority among terrorists.

For our analysis, we assume that the increase in US expenditures on homeland

security since 2001 has been dramatically effective, reducing the remaining risk by an

additional 45 percent. Total risk reduction, is generously assumed, then, to be 95

percent with the pre-existing measures and the extra public vigilance responsible for 50

percent of the risk reduction and the enhanced expenditures responsible for the

remaining 45 percent.

Putting this all together, we find that, in order for enhanced expenditures on

homeland security to begin to be deemed cost-effective under our approach—which

substantially biases the consideration toward finding them effective—they would have to

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[17] Michael Kenney, "'Dumb' Yet Deadly: Local Knowledge and Poor Tradecraft among Islamist Militants in Britain and Spain," *Studies in Conflict & Terrorism,* 33(10) October 2010: 911–932; Mueller and Stewart, "The Terrorism Delusion." For a discussion of the real world relevance of "Four Lions," a fiction film about a bumbling band of would-be terrorists in Britain, see John Mueller, "Introduction," in John Mueller, ed., *Terrorism Since 9/11: The American Cases* (Columbus: Mershon Center, Ohio State University, 2013), 27-28, polisci.osu.edu/faculty/jmueller/since.html.

deter, prevent, foil, or protect each year against 1,667 otherwise successful attacks

something like the one attempted on Times Square in 2010—more than four per day.[18]

There are extreme scenarios that can be taken to suggest that enhanced U.S.

security expenditures could be cost-effective—the nightmare vision of a nuclear attack

in a crowded city as well as costly massive overreaction. However, for those who find

such outcomes dangerously likely, the policy response would logically be to spend on

reducing the risk of nuclear terrorism in the one case and to develop strictures to

overreaction in the other. It would not be, for example, to spend tens of billions of dollars

each year on protection measures.

Our findings dealing with the total enhanced homeland security expenditures

should not be taken to suggest that *all* security measures necessarily fail to be cost-

effective: there may be specific measures that are cost-effective. But each should be

subjected to the kind of risk analysis we have applied to the overall increases in

expenditure.

We have done so for several specific measures. It appears, for example, that the

protection of a standard office-type building would be cost-effective only if the likelihood

of a sizable terrorist attack on the building is a thousand times greater than it is at

present. Something similar holds for the protection of bridges. On the other hand,

hardening cockpit doors on aircraft appear to be cost-effective. However, the provision

for air marshals on the planes decidedly is not, and the cost-effectiveness of full-body

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[18] For a fuller discussion, see Mueller and Stewart, *Terror, Security, and Money*, ch. 4.

scanners is questionable at best.[19] Overall, far the most cost-effective counterterrorism measure is to refrain from overreacting.

Risk communication

Officials who seek to expend limited funds in a manner that best enhances public safety should be risk-neutral: insofar as this can be determined, they should deal with the objective likelihood the hazard will occur, and rely on that in their decision making. In this we follow the U.S. Office of Management and Budget requirement that governments expending tax money in a responsible manner need to be neutral when assessing risks, something that entails focusing primarily on mean estimates in risk and cost-benefit calculations, not primarily on worst-case or pessimistic ones.[20]

The willingness to accept risk, however, is influenced not only by its objective likelihood but by a variety of psychological, social, cultural, and institutional processes that depend on such qualities as recent experience and the uncontrollability of the risks; the dread (or fear) they inspire; their involuntary nature or catastrophic potential; whether they can be preventively controlled, are certain to be fatal, can easily be reduced, result in an inequitable distribution of risk, threaten future generations, or affect one personally; whether they are increasing or not observable, unknown to those

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[19] Mueller and Stewart, *Terror, Security, and Money*, chs. 6-7; Mark G. Stewart and John Mueller, "Aviation Security, Risk Assessment, and Risk Aversion for Public Decisionmaking," *Journal of Policy Analysis and Management*, 32(3) 2013: 615–633; Mark G. Stewart and John Mueller, "Terrorism Risks and Cost-Benefit Analysis of Aviation Security," *Risk Analysis* 33(5) 2013: 893-908.

[20] Office of Management and Budget, "Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs (Revised)," Circular No. A-94, 29 October 1992, Washington, DC.

exposed, new or unfamiliar, and unknown to science; and whether they have immediate effect or affect a large number of people.[21]

It is important, then, for officials to communicate risk objectively. If they can convince their constituents to adopt a risk-neutral perspective, they will be in a far better position to expend pubic funds in ways that most enhance public safety.

It is true that few voters spend a great amount of time following the ins and outs of policy issues and even fewer are certifiable policy wonks. But they *are* grown-ups, and it is just possible they would respond reasonably to an adult conversation about terrorism.[22] Obviously, as noted earlier, the huge increases in counterterrorism expenditures have not so far done much to reduce anxiety.

Responsible counterterrorism policy

In seeking to evaluate the effectiveness of the massive increases in homeland security expenditures since September 11, 2001, the common and urgent query has been "are we safer?" This, however, is the wrong question. Of course, we are "safer"— the posting of a single security guard at one building's entrance enhances safety, however microscopically. The correct question is "are the gains in security worth the funds expended?" Or, as it was posed shortly after 9/11 by risk analyst Howard

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[21] Mark G. Stewart and Robert E. Melchers, *Probabilistic Risk Assessment of Engineering Systems* (London: Chapman & Hall, 1997), 208–216. Paul Slovic, Baruch Fischhoff , and Sarah Lichtenstein, "Facts and Fears: Understanding Perceived Risk," in R. C. Schwing and W. A. Albers, eds., *Societal Risk Assessment: How Safe is Safe Enough?* (New York: Plenum, 1980), 181–216.

[22] For a discussion, see John Mueller, Mark G. Stewart, and Benjamin H. Friedman, "Finally Talking Terror Sensibly," nationalinterest.org, 24 May 2013.

Kunreuther, "How much should we be willing to pay for a small reduction in probabilities that are already extremely low?"[23]

Working to answer this absolutely central question involves dealing with considerations of cost per saved life and acceptable risk as fed into cost-benefit methodology. However, as far as we can see, Department of Homeland Security decision-makers do not following robust risk assessment methodology. If they did, low cost solutions that are easily deployed and effective would be the first to be implemented, and we do not find this to be the standard. This observation is supported in a 2010 report by a committee of the U.S. National Academy of Sciences. After spending the better part of two years investigating the issue, the committee could not find "any DHS risk analysis capabilities and methods" adequate for supporting the decisions made about spending on terrorism, and noted that "little effective attention" was paid to "fundamental" issues. With one exception, it was never shown "any document" that could explain "exactly how the risk analyses are conducted," and it looked over reports in which it was not clear "what problem is being addressed." This situation is particularly strange because, as the committee also notes, the risk models used in the department for *natural* hazards are "near state of the art" and "are based on extensive data, have been validated empirically, and appear well suited to near-term decision needs."[24] Moreover, when it comes to terrorism, DHS appears to be

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[23] Howard Kunreuther, "Risk Analysis and Risk Management in an Uncertain World," *Risk Analysis* 22(4) 2002: 662–663. See also John Mueller, "Some Reflections on What, If Anything, 'Are We Safer?' Might Mean," cato-unbound. org, 11 September 2006.

[24] National Research Council of the National Academies, *Review of the Department of Homeland Security's Approach to Risk Analysis* (Washington, DC: National Academies Press, 2010). An

exceptionally risk-averse: its decisions cannot be supported even with the most risk-averse utility functions possible, and its level of risk aversion is exhibited by few, if any, government agencies including the U.S. Nuclear Regulatory Commission and Environmental Protection Agency.[25]

Looking more broadly, any sensible cost-effectiveness analysis must include a consideration of what else could have been done with the effort and money being expended on the policy proposed.[26] When we spend resources on regulations and procedures that save lives at a high cost, we forgo the opportunity to spend those same resources on measures that can save more lives at the same cost or even at a lower one.[27] Homeland security expenditures invested in a wide range of more cost-effective risk reduction programs like flood protection, vaccination

and screening, vehicle and road safety, health care, and occupational health and safety would probably result in far more significant benefits to society. For example, diverting a

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evaluation of a risk analysis tool developed for the DHS is similarly critical. The tool has "thousands of input variables," many of which cannot be estimated with much precision, and it could generate results that are "completely wrong." Moreover, it takes so long to run that it was not possible "to conduct even a superficial sensitivity analysis" of its "many thousands of assumptions and parameter estimates." Moreover, it only deals with relative risk, not absolute risk (a key criticism as well in the 2010 NRC study), and its estimates of these "are subject to strong, probably untenable, assumptions." The tool is also insensitive to changes in the magnitude of risk and "assumes no attack can be deterred." A.R. Morral et al., *Modeling Terrorism Risk to the Air Transportation System* (Santa Monica, CA: RAND Corporation, 2012).
[25] Mark G. Stewart, Bruce R. Ellingwood and John Mueller, "Homeland Security: A Case Study in Risk Aversion for Public Decision-Making, *International Journal of Risk Assessment and Management*, 15(5/6) 2011: 367-386; Stewart and Mueller, "Aviation Security, Risk Assessment, and Risk Aversion for Public Decisionmaking."
[26] Bruce Schneier, *Beyond Fear: Thinking Sensibly about Security in an Uncertain World* (New York: Copernicus, 2003).

few percent of the nearly $10 billion per year spent on airline security could save many

lives at a fraction of the cost if it were instead spent on seat belts for automobiles,

bicycle helmets for children, tandem mass spectrometry screening programs, front air

bags, smoke alarms, or tornado shelters.[28]

It may be useful in this light to put counterterrorism expenditures in the broadest

comparative context. Bjorn Lomborg assembled a group of international experts to

answer one question: "if we had an extra $75 billion to put to good use, which problems

would we solve first?"[29] This sum is less than what the United States spends on

homeland security in a single year. More than 40 experts, tasked to do "what is rational

instead of what is fashionable," applied cost-benefit thinking to a wide range of issues.

For many measures, the benefit is ten times greater than the cost, and, most important,

the number of lives saved is spectacular. According to these analysts, an investment of

merely $2 billion could save more than 1.5 million lives: 1 million child deaths could be

averted by expanded immunization coverage while community-based nutrition programs

could save another half a million. In assessing expenditures for dealing with

transnational terrorism, by contrast, the experts found costs to be 3 to 25 times higher

than any benefits.[30]

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[27] Tammy O. Tengs and John D. Graham, "The Opportunity Costs of Haphazard Social Investments," in R. W. Hahn, ed., *Life-Saving, Risks, Costs, and Lives Saved: Getting Better Results from Regulation* (Washington, DC: American Enterprise Institute, 1996), 167–182.
[28] Mueller and Stewart, *Terror, Security, and Money*, 182-183.
[29] Bjorn Lomborg, *Global Crises, Global Solutions* (Cambridge, UK: Cambridge University Press, 2009), 1.
[30] Todd Sandler, Daniel G. Arce, and Walter Enders, "Transnational Terrorism," in Lomborg, *Global Crises, Global Solutions*, 552. They place the value of life at $2 million in their calculations.

If diversions of funds would easily save many hundreds, if not thousands, of lives over time, a government obliged to allocate funds in a manner that best benefits society must explain why it is spending billions of dollars on security measures with very little proven benefit and why that policy is something other than a reckless waste of resources. This disregard of basic cost-benefit considerations not only wastes money but costs lives.

We recognize that risk and cost-benefit considerations should not be the sole criterion for public decision making. Nonetheless, they provide important insights into how measures designed to enhance personal security may (or may not) perform, their effect on risk reduction, and their cost-effectiveness. They can reveal wasteful expenditures and allow limited funds to be directed where the most benefit can be attained. If risk and cost-benefit advice is to be ignored, the onus is on public officials to explain why this is so and to detail the trade-offs and cuts to other programs that will inevitably ensue.

"Policy-making is a risky business," one group of analysts has acknowledged. But they continue, "regardless of the varied desires and political pressures, we believe that it is the responsibility of analysts forcefully to advocate rational decision methods in public policy-making, especially for those with high risk."[31] Or as Paté-Cornell observes, if rational approaches to public policy making are not utilized, politically driven processes "may lead to raising unnecessary fears, wasting scarce resources, or

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[31] J. Brian Hardaker, Euan Fleming, and Gudbrand Lien, "How Should Governments Make Risky Policy Decisions?" *Australian Journal of Public Administration* 68(3) 2009: 256–271.

ignoring important problems." [32] Important in all this, as risk analyst David Banks has

suggested, is "the distinction between realistic reactions to plausible threats and

hyperbolic overreaction to improbable contingencies."[33]

To be irrational with your own money may be to be foolhardy, to give in to guilty

pleasure, or to wallow in caprice. But to be irrational with other people's money,

particularly where public safety is concerned, is to be irresponsible, to betray an

essential trust. In the end, it becomes a dereliction of duty that cannot be justified by

political pressure, bureaucratic constraints, or emotional drives. Risk reduction

measures that produce little or no net benefit to personal security or produce it at a very

high cost cannot be justified on rational life-safety and economic grounds—they are not

only irresponsible, but, essentially, immoral.

Because people are often more risk-acceptant or risk-averse than an objective

analysis would dictate, politicians and bureaucrats face considerable political pressure

on the terrorism issue. Their dilemma is nicely parsed by James Fallows. He points out

that "the political incentives here work only one way." A politician who supports more

extravagant counterterrorism measures "can never be proven wrong" because an

absence of attacks shows that the "measures have 'worked'," while a new attack shows

that we "must go farther still." Conversely, a politician seeking to limit expenditure "can

never be proven 'right'" while "any future attack will always and forever be that

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[32] Elisabeth Paté-Cornell, "Risk and Uncertainty Analysis in Government Safety Decisions,"
Risk Analysis 22(3) 2002: 633–646.
[33] David L. Banks, "Statistics for Homeland Defense," *Chance* 15(1) 2002: 10.

politician's 'fault'."[34]

However, it is possible that politicians and bureaucrats are overly fearful about the political consequences. Indeed, sometimes leaders have been able to restrain their instinct to overreact, and this has often proved to be entirely acceptable politically. The United States did not massively overreact to terrorist bombings against its soldiers and citizens in Lebanon in 1983 or over Lockerbie, Scotland, in 1988.[35] This is a particularly important issue because it certainly appears that avoiding overreaction is by far the most cost-effective counterterrorism measure.

Moreover, although political pressures may force actions and expenditures that are unwise, they usually do not precisely dictate the level of expenditure. Thus, although there are public demands to "do something" about terrorism, nothing in that demand specifically requires American officials to require removing shoes in airport security lines or acquiring passports to enter Canada, to spread bollards like dandelions, or to make a huge number of buildings into forbidding fortresses. The United Kingdom, which faces an internal threat from terrorism that seems considerably greater than that for the United States, appears nonetheless to spend proportionately much less than half as much on homeland security, and the same holds for Canada and Australia. Yet politicians and

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[34] James Fallows, "If the TSA Were Running New York," theatlantic.com, May 2010.

[35] On this issue, see Mueller and Stewart, *Terror, Security, and Money*, 179-82. One might also compare the reaction to 9/11 with that to the worst terrorist event in the developed world before then, the downing of an Air India airliner departing Canada in 1985 in which 329 people, 280 of them Canadian citizens, perished. Journalist Gwynne Dyer points out that, proportionate to population, the losses were almost exactly the same in the two cases. But continues Dyer, "here's what Canada didn't do: it didn't send troops into India to 'stamp out the roots of the terrorism' and it didn't declare a 'global war on terror.' Partly because it lacked the resources for that sort of adventure, of course, but also because it would have been stupid." Gwynne Dyer, "The

bureaucrats there do not seem to suffer threats to their positions or other political

problems because of it.

In the end, however, if officials are incapable of carrying out their jobs in an

efficient and effective manner that provides the most security for the money expended,

they should frankly admit they are being irresponsible—that they consider retaining their

position to be more important than providing for public safety—or they should refuse to

take the job in the first place. People who join the army or become fire-fighters accept

the possibility that at some point they may be put in a position in which they are shot at

or required to enter a burning building. People who become decision-makers should in

equal measure acknowledge that in order to carry out their job properly and responsibly,

they may be required on occasion to make some difficult, even career-threatening,

decisions.

Finally, even if officials can't bring themselves to embrace appropriate and

accepted methodology to determine the value of their spending on measures designed

to enhance personal security, they still bear a fundamental responsibility to inform the

public honestly and accurately of the risk that terrorism presents. Instead, the emphasis

has been on exacerbating fears.

Indeed, despite the importance to responsible policy of seeking to communicate

risk and despite the costs of irresponsible fear-mongering, just about the *only* official in

the United States who has *ever* openly put the threat presented by terrorism in some

sort of context is New York's Mayor Michael Bloomberg who in 2007 pointed out that

International Terrorist Conspiracy," gwynnedyer.com, June 2, 2006.

people should "get a life" and that they have a greater chance of being hit by lightning

than of being struck by terrorism.[36] It might be noted that this unconventional outburst

did not have negative consequences for him. Although he had some difficulties in his

reelection two years later, his blunt, and essentially accurate, comments about terrorism

were not the cause. Policy makers might take note.

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[36] Sewell Chan, "Buzz Over Mayor's 'Get a Life' Remark," nytimes.com, June 6, 2007. See also John Mueller, *Overblown* (New York: Free Press, 2006), 151.

Table 1.   Regulatory Expenditure Per Life Saved

Regulation	Year	Agency	Cost per life saved in 2010 dollars
Steering column protection standards	1967	NHTSA	140,000
Unvented space heater ban	1980	CPSC	140,000
Seatbelt/air bag	1984	NHTSA	140,000
Aircraft cabin fire protection standard	1985	FAA	140,000
Underground construction standards	1989	OSHA	140,000
Auto fuel system integrity	1975	NHTSA	710,000
Trihalomethane in drinking water	1979	EPA	850,000
Aircraft seat cushion flammability	1984	FAA	850,000
Alcohol and drug controls	1985	FRA	850,000
Aircraft floor emergency lighting	1984	FAA	990,000
Concrete and masonry construction	1988	OSHA	990,000
Passive restraints for trucks and buses	1989	NHTSA	1,100,000
Children's sleepwear flammability ban	1973	CPSC	1,400,000
Auto side impact standards	1990	NHTSA	1,400,000
Metal mine electrical equipment standards	1970	MSHA	2,400,000
Trenching and evacuation standards	1989	OSHA	2,600,000
Hazard communication standard	1983	OSHA	2,700,000

Trucks, buses and MPV side-impact	1989	NHTSA	3,700,000
Grain dust explosion prevention	1987	OSHA	4,700,000
Rear lap/shoulder belts for autos	1989	NHTSA	5,400,000
Standards for radionuclides in uranium mines	1984	EPA	5,800,000
Ethylene dibromide in drinking water	1991	EPA	9,700,000
Asbestos occupational exposure limit	1972	OSHA	14,000,000
Benzene occupational exposure limit	1987	OSHA	15,000,000
Electrical equipment in coal mines	1970	MSHA	15,800,000
Arsenic emission standards for glass plants	1986	EPA	22,900,000
Cover/move uranium mill tailings	1983	EPA	76,100,000
Acrylonitrate occupational exposure limit	1978	OSHA	87,000,000
Coke ovens occupational exposure limit	1976	OSHA	107,400,000
Arsenic occupational exposure limit	1978	OSHA	180,800,000
Asbestos ban	1989	EPA	187,200,000
1,2-Dechloropropane in drinking water	1991	EPA	1,103,900,000
Hazardous waste land disposal ban	1988	EPA	7,084,000,000
Municipal solid waste landfills	1988	EPA	32,300,000,000
Formaldehyde occupational exposure limit	1987	OSHA	145,723,000,000
Atrazine/alachlor in drinking water	1991	EPA	155,640,000,000
Hazardous waste listing for wood-preserving chemicals	1990	EPA	9,635,870,000,000

Adapted by Mark Stewart from W. Kip Viscusi, "The Value of Life in Legal Contexts:

Survey and Critique," *American Law and Economics Review* 2(1) 2000: 195–222.

Table 2. Comparison of Annual Fatality Risks

Hazard	Territory	Period	Total fatalities for the period	Annual fatality risk
World War II	Worldwide	1939-1945	61,000,000	1 in 221
Cancers	US	2009	560,000	1 in 540
War (civilians)	Iraq	2003-2008	113,616	1 in 1,150
All accidents	US	2007	119,000	1 in 2,500
Traffic accidents	US	2008	37,261	1 in 8,200
Traffic accidents	Canada	2008	2,431	1 in 13,500
Traffic accidents	Australia	2008	1,466	1 in 15,000
Homicide	US	2006	14,180	1 in 22,000
Traffic accidents	UK	2008	2,538	1 in 23,000
Terrorism	**Northern Ireland**	**1970-2007**	**1,758**	**1 in 43,000**
Industrial accidents	US	2007	5,657	1 in 53,000

Homicide	Canada	2008	611	1 in 55,000
Intifada	**Israel**	**2000-2006**	**553**	**1 in 72,000**
Homicide	Great Britain	2008	887	1 in 67,000
Homicide	Australia	2008	290	1 in 76,000
Terrorism	**US**	**2001**	**2,982**	**1 in 101,000**
Natural disasters	US	1999-2008	6,294	1 in 480,000
Drowning in bathtub	US	2003	320	1 in 950,000
Terrorism	**UK**	**1970-2007**	**2,196**	**1 in 1,100,000**
Home appliances	US	yearly average	200	1 in 1,500,000
Deer accidents	US	2006	150	1 in 2,000,000
Commercial aviation	US	yearly average	130	1 in 2,300,000
Terrorism	**US**	**1970-2007**	**3,292**	**1 in 3,500,000**
Terrorism	**Canada**	**1970-2007**	**336**	**1 in 3,800,000**
Terrorism	**Great Britain**	**1970-2007**	**434**	**1 in 5,200,000**
Peanut allergies	US	yearly average	50-100	1 in 6,000,000
Lightning	US	1999-2008	424	1 in 7,000,000
Terrorism	**Australia incl Bali**	**1970-2007**	**117**	**1 in 7,100,000**

Transnational Terrorism	World outside war zones	1975-2003	13,971	1 in 12,500,000