

CONSTRUCTING AN **ELICITATION** ON THE **RISKS** OF WEAPONS OF MASS DESTRUCTION

Lessons from Analyzing the Lugar Survey

Appendix: Literature Analysis



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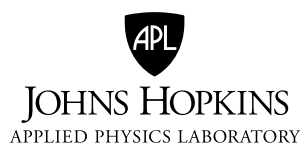
Lessons from Analyzing the Lugar Survey

APPENDIX: LITERATURE ANALYSIS

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1	<p>Title: An Analysis of Terror Warnings</p> <p>Publication (Publisher): SSRN paper (Elsevier)</p> <p>Link: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=650343</p> <p>Quote: "Assessing the costs and benefits of defense against a potential attack is a meaningless exercise without an assessment of the likelihood or frequency of attack. An example of an attempt to address this question is a survey conducted by Senator Richard Lugar the chairman of the senate foreign relations committee (Lugar 2005). Experts on security policy were surveyed about their opinions regarding the threats faced by the United States from weapons of mass destruction. The survey finds that on average these experts believe that the probability of a nuclear attack on the United States in the next decade is 29.2%, of a radiological attack 40%, of a biological attack 32.6%, and of a chemical attack 30.5%. 62% of the respondents thought the probability of a nuclear attack was between 10% and 50%. The high end of this range would justify a five fold increase in defensive spending over the low end of the range.</p> <p>"We can conclude from these examples that even in areas that risk analysts and policy makers are experienced in, there is considerable uncertainty about parameter values and when we layer on the less well understood aspects of the problem the uncertainties increase. As a result it is important to use great care in interpreting the results of the model and focus on identifying insights that are general and not very sensitive to particular parameter values. In the following we use parameter values chosen for illustrative purposes but consistent with the studies reported above."</p>	<p>Author(s): Edieal J. Pinker</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 14, 10, 12</p>
2	<p>Title: US Survey: Next Decade Holds a 70 Percent Chance of a Nuclear Terrorist Act</p> <p>Publication (Publisher): News post (Bellona Foundation)</p> <p>Link: https://bellona.org/news/nuclear-issues/nuclear-agreements/2005-06-us-survey-next-decade-holds-a-70-percent-chance-of-a-nuclear-terrorist-act</p> <p>Quote: "The Senate Foreign Relations Committee, chaired by Republican Senator Richard Lugar, surveyed analysts around the world in late 2004 and early this year to determine how critical they considered the threat posed by weapons of mass destruction. The committee's study is entitled 'The Lugar Survey on Proliferation Threats and Responses.'</p> <p>"The study was commissioned by Lugar—who with former Georgia Democratic Senator Sam Nunn founded the Nunn-Lugar, or Co-operative Threat Reduction (CTR), act—whose non-proliferation efforts in Congress have helped the states of the former Soviet Union reduce their stockpiles of nuclear, chemical and biological weapons. The CTR programme is driven by the US Department of Defence, and was the first of its kind to spring up after the dissolution of the Soviet Union.</p> <p>"The bottom line is this: For the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction," Lugar said in a statement."</p>	<p>Author(s): Charles Digges</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 13, 14, 9, 10, 11, 12, 1, 2, 6, 16, 8</p>
3	<p>Title: Experts Assess Likelihood of Nuclear, Biological Attacks</p> <p>Publication (Publisher): News (Ketchikan SitNews)</p> <p>Link: http://www.sitnews.us/0605news/062605/062605_nuclear_bio.html</p> <p>Quote: "In the next 10 years, the world faces a 29 percent chance there will be a nuclear attack, in part because four new nations will be added to the nuclear weapons club, according to a survey compiled by Senate Foreign Relations Chairman Richard G. Lugar.</p> <p>"The survey of arms control and national security experts also indicated there is a 30 percent chance there will be a major chemical or biological attack, Lugar said in a prepared statement released June 24.</p> <p>"The prospects of a dirty bomb attack were pegged at 40 percent,' he said. A dirty bomb is a high explosive that has been contaminated with radioactive materials.</p> <p>"The study surveyed 85 senior international scholars, policy-makers, diplomats, and technicians on the spread of dangerous weapons and international responses to the growing problem.</p> <p>"The Lugar survey found that 79 percent believed that their own country was not spending enough money on nonproliferation objectives,' he said. 'None of the experts surveyed believed that their country was spending too much on these goals.'</p> <p>"A majority of the experts surveyed suggest that terrorists, rather than a government, are more likely to launch a nuclear attack, and that they are most likely to obtain a nuclear weapon or nuclear materials through the black market, Lugar said.</p> <p>"Respondents also emphasized the need to end the nuclear programs in North Korea and Iran,' Lugar said."</p>	<p>Author(s): Unknown</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 2, 10, 12, 14, 16, 6, 7, 20</p>

4	<p>Title: Feasibility of Determining Radioactivity in Lungs Using a Thyroid Uptake Counter</p> <p>Publication (Publisher): Thesis (Georgia Institute of Technology)</p> <p>Link: https://smartech.gatech.edu/bitstream/handle/1853/7460/lorio_ryan_a_200512_mast.pdf</p> <p>Quote: "In a recent survey of some of the nation's leading experts, the probability of an attack from a weapon of mass destruction (WMD) is as high as 50 percent over the next five years with the most significant risk of attack expected to come from a radiological dispersal device (RDD) (Lugar, 2005). These devices may be implemented in a number of different forms, each having the ability to spread radioactive isotopes over a large area. If an RDD event were to take place in a metropolitan area, the result would be a large number of people ingesting or inhaling radioactive material."</p>	<p>Author(s): Ryan Lorio</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 13</p>
5	<p>Title: Global Partnership Program: Securing the Future</p> <p>Publication (Publisher): Report (Canada Ministry of Foreign Affairs)</p> <p>Link: https://publications.gc.ca/collections/collection_2008/dfait-maeci/FR4-9-2005E.pdf</p> <p>Quote: Includes a quote from the Lugar survey in a callout box—"We must anticipate that terrorists will use weapons of mass destruction if allowed the opportunity. The minimum standard for victory in this war is the prevention of any terrorist cell from obtaining weapons or materials of mass destruction. We must make certain that all sources of WMD are identified and systematically guarded or destroyed."</p>	<p>Author(s): Ministry of Foreign Affairs</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: None</p>
6	<p>Title: InBRIEF</p> <p>Publication (Publisher): <i>Arms Control Today</i> journal article (Arms Control Association)</p> <p>Link: https://www.jstor.org/stable/23627797</p> <p>Quote: Cites data from the Lugar survey in a callout box— "Expert opinion survey on proliferation threats and responses: "79 percent The government is not spending enough on nonproliferation. "78 percent One or two nations will come into possession of nuclear weapons in the next five years. "47 percent Nonproliferation efforts have regressed in the last year. "32 percent Nonproliferation efforts have improved in the last year. "20 percent Median likelihood of a nuclear attack during the next 10 years. "Sen. Richard G. Lugar (R-Ind.) released the Lugar Survey on Proliferation Threats and Responses in June 2005. The survey is based on responses received from a bipartisan group of 85 experts in nonproliferation and security affairs, including former Secretary of Defense William Cohen, former Deputy Secretary of State Strobe Talbott, former Senator Sam Nunn (D-Ga.), former head of the Iraq Survey Group David Kay, and former CIA director R. James Woolsey. Officials serving in the Bush administration were not surveyed."</p>	<p>Author(s): unknown</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 16, 1, 15, 5</p>
7	<p>Title: Israel's Withdrawal from Gaza and the Prospects for Peace</p> <p>Publication (Publisher): News (KCRW)</p> <p>Link: https://www.kcrw.com/news/shows/to-the-point/israels-withdrawal-from-gaza-and-the-prospects-for-peace</p> <p>Quote: "The chance of a nuclear attack somewhere in the world is almost 30% in the next 10 years; the chance of a so-called 'dirty bomb' or major chemical or biological attack is 40%. That's from a survey of 85 experts on weapons proliferation, sponsored by Republican Senator Richard Lugar of Indiana. One of those surveyed was Graham Allison, former Assistant Secretary of Defense during the Clinton Administration."</p>	<p>Author(s): Warren Olney</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 14, 12, 10</p>

8	<p>Title: Lugar Releases New Report on WMD Threats and Responses</p> <p>Publication (Publisher): Blog post (beSpecific)</p> <p>Link: https://www.bespacific.com/lugar-releases-new-report-on-wmd-threats-and-responses/</p> <p>Quote: "During the next ten years the world faces a 29 percent chance of a nuclear attack and the prospect of four new nations being added to the nuclear weapons club, according to a new survey of non-proliferation and national security experts compile by Senate Foreign Relations Committee Chairman Dick Lugar. Over the same period, the experts rated the risks of a major chemical or biological attack as both greater than 30 percent, while the prospects of a dirty bomb attack were pegged at 40 percent."</p>	<p>Author(s): Sabrina I. Pacifici</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 2, 5, 10, 12, 14</p>
9	<p>Title: New Report Paints Grim Picture for Future WMD Attacks</p> <p>Publication (Publisher): Blog post (Homeland Security Digital Library)</p> <p>Link: https://www.hsdl.org/c/new-report-paints-grim-picture-for-future-wmd-attacks/</p> <p>Quote: Entire post: "A new survey released by Senator Lugar, chair of the Foreign Relations Committee predicts that within the next ten years more countries will be added to the list of nuclear capable and that there will be a 30 to 40 percent increase in the likelihood of a chemical, biological or radiological attack. In addition, these attacks will most likely be conducted by a terrorist or nonstate actor. The survey also found that a preponderance of those surveyed felt that their country has not put enough money into securing stockpiles of these dangerous materials or in non-proliferation programs. Read Senator Lugar's release and the report, The Lugar Survey On Proliferation Threats and Responses at http://lugar.senate.gov/pressapp/record.cfm?id=239283 and http://lugar.senate.gov/reports/NPSurvey.pdf respectively."</p>	<p>Author(s): Sally Chapman</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 2, 10, 12, 14, 17, 19</p>
10	<p>Title: Pondering the Chances of a Nuclear Attack</p> <p>Publication (Publisher): News article (<i>Wall Street Journal</i>)</p> <p>Link: https://www.wsj.com/articles/SB112059629605777656</p> <p>Quote: "But how do you predict the likelihood of an event that has never happened before?"</p> <p>"The past is the baseline for predicting the future. In forecasting company revenue, economic indicators and hurricane counts, experts start with prior numbers and adjust them higher or lower to reflect expected future trends. When it comes to estimating the chance of a terrorist attack using biological or nuclear weapons, it's hard to go beyond an educated guess."</p> <p>"Two weeks ago, Sen. Richard Lugar (R., Ind.), chairman of the Senate Foreign Relations Committee, released the results of an ambitious survey of arms experts. The study was conducted in late 2004 and early 2005. On average, the 85 respondents predicted a 29.2% chance of a nuclear attack in the next decade, with 79% saying that such an attack was more likely to be carried out by terrorists than by a government. Sen. Lugar said in the report that 'the estimated combined risk of a WMD attack over five years is as high as 50%. Over 10 years this risk expands to as much as 70%.' . . .</p> <p>"Yet there are also drawbacks. As well-informed as arms experts are, and as well-intentioned, I'd argue they have a natural bias toward overstating risk — greater risk increases the value of their expertise, and, therefore, their prominence and even funding. Politicians who commission such predictions likely do so because they want to raise awareness, a goal best served by alarming results."</p>	<p>Author(s): Carl Bialik</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 6, 14, 20</p>
11	<p>Title: Redefining the Threat</p> <p>Publication (Publisher): <i>Bulletin of the Atomic Scientists</i> journal article (Sage)</p> <p>Link: https://journals.sagepub.com/doi/pdf/10.2968/061005007</p> <p>Quote: The whole article is about the survey and is written by Lugar.</p>	<p>Author(s): Richard G. Lugar</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 6, 7, 8, 10, 15, 19, 20</p>

12	<p>Title: Secure Energy: Options for a Safer World—Security and Nuclear Power</p> <p>Publication (Publisher): Factsheet (Oxford Research Group)</p> <p>Link: https://nonuclear.se/files/barnaby-security-and-nuclear-power200511.pdf</p> <p>Quote: Includes a table of the average results from the Lugar survey, with the following comment: "These results are based on a survey of over 80 experts in the field of non-proliferation, counter-proliferation, diplomacy, military affairs, arms inspections, intelligence gathering and other national security fields."</p> <p>Just above the table is the following: "Nuclear facilities and nuclear materials may be tightly controlled but the risks of nuclear terrorism are simply too great."</p>	<p>Author(s): Frank Barnaby</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 2, 3, 6, 8, 15</p>
13	<p>Title: Senator Lugar Releases New Report on WMD Threats, Responses</p> <p>Publication (Publisher): News site (US Fed News Service, Including US State News; relaying a press release from the Office of Senator Richard Lugar)</p> <p>Link: https://www.proquest.com/docview/470638708/58C13C6366FD4449PQ/2</p> <p>Quote: The entire press release is about the Lugar survey. It includes the following:</p> <p>"According to the survey, the highest non-proliferation priority of the United States and the international community should be the U.S. Nunn-Lugar Cooperative Threat Reduction program and companion international efforts. Respondents also emphasized the need to end the nuclear programs in North Korea and Iran." . . .</p> <p>"The Lugar Survey, conducted in late 2004 and early 2005, is intended to help define the parameters of the proliferation risks faced by the international community, as well assess non-proliferation activities by the United States and other governments.</p> <p>"I am hopeful that this study will contribute to the discussion inside and outside of governments about how we can strengthen non-proliferation efforts, improve safeguards around existing weapons and materials, bolster intelligence gathering and interdiction capabilities, and expand international cooperation in dealing with a threat that should deeply concern all governments and peoples," Lugar said.</p> <p>"The bottom line is this: For the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction. Preventing terrorists from obtaining weapons or materials of mass destruction is a far more exacting arms control goal than existed during the 1970s and 1980s, when a successful agreement might allow for thousands of new nuclear weapons," Lugar continued."</p>	<p>Author(s): Office of Senator Richard Lugar</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 5, 2, 12, 10, 16, 6, 7, 19, 20</p>
14	<p>Title: Structural Failures of a Mass Evacuation by Automobile</p> <p>Publication (Publisher): Blog (gongol.com)</p> <p>Link: http://www.gongol.com/research/disasters/evacuationbyauto/</p> <p>Quote: "Economist Tyler Cowen has proposed paying people to stay in the path of an anticipated storm. On one hand, that's certainly creative thinking for anticipatable events like hurricanes and may merit further consideration. But it's absolutely unworkable for unexpected events like terrorist attacks. Given the very high risk of terrorist attacks using non-conventional weapons (the Lugar Survey on Proliferation suggests that the national security community puts the 10-year chances of radiological or biological attacks in the 20% to 30% range), we need to examine exactly why the evacuations haven't worked and what needs to be done so that they will work in the future."</p>	<p>Author(s): Brian Gongol</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 10, 14</p>

15	<p>Title: Toward a Cost-Benefit Analysis of Nuclear Terrorism Prevention Technology</p> <p>Publication (Publisher): White paper (University of Washington)</p> <p>Link: https://courses.cs.washington.edu/courses/csep590/05au/whitepaper_turnin/NuclearTerrorPrevention.pdf</p> <p>Quote: "In order to determine the expected value of a nuclear terrorist attack, we must discover two variables—the probability of such an attack, and the expected damage from such an attack—neither of which is easily determined. Even the rough estimates described below incorporate much uncertainty; to capture this uncertainty we have run probabilistic models of the variables in the expected value formulas. Our results are therefore in 95 percent confidence intervals, rather than point estimates.</p> <p>"We found three sources for the probability of a nuclear terrorist attack. In 2004, Senator Richard Lugar surveyed roughly 80 terrorism and nuclear experts, and has a useful distribution of their predictions of nuclear attacks within 5 and 10 years. Second, the Nuclear Threat Initiative, led by former Senator Sam Nunn, has ventured a prediction of an attack on US soil within 10 years. Finally, we use a recently published article modeling the frequency and severity of terrorist attacks since 1968 to extrapolate the probability of a nuclear terrorist attack. All of these probabilities have significant—perhaps even fatal—shortcomings; however, we feel strongly that having little information is better than having no information at all, particularly when it comes to our risk of a nuclear terrorist attack. . . .</p> <p>"In June 2005, Senator Lugar published the results of a survey that he conducted on various WMD proliferation threats and responses. In this survey Senator Lugar collected the opinions of non-proliferation and national security experts with the intent of discovering consistencies and divergences in their expert opinions on non-proliferation. The experts chosen were men and women who have dedicated their professional careers to the study and practice of preventing weapons of mass destruction and materials from falling into unauthorized hands. Some of the experts were national security leaders in other countries.</p> <p>"Roughly 80 experts responded to the survey. We must emphasize that the experts queried do not represent a random sample of experts; as a result, the data only reflects the beliefs of the experts queried and not the national security community as a whole. In addition, we have done no analysis of the response rate and its possible biases. Thus, the data reflects any biases of the sample.</p> <p>"We contacted senator Lugar's office to try to obtain the raw, anonymous responses he received. They declined citing privacy concerns. However, the report available online has aggregated data sufficient for our purposes of estimation.</p> <p>According to the experts surveyed, the possibility of a WMD attack against a target somewhere in the world is real and increasing over time. Even within the next five years, the chances of such an attack were judged to be substantial. The median estimate of the probability of a nuclear attack during the next 5 years was 10 percent. The average estimate was 16.4 percent. When the time frame was extended to 10 years, the median response doubled to 20 percent and the average response almost doubled to 29.2 percent. By comparison, the estimates of the probability of a biological or chemical attack during the same time periods were each judged to be equal to or only slightly higher than the risk of a nuclear attack.</p> <p>"The group saw the chance of a radiological attack as significantly higher. The median and average estimates of probability were 25 percent and 27.1 percent respectively over the next five years. Over ten years, both the median and the average estimate of probability jumped to 40 percent. The median estimate of the probability of a radiological attack over ten years was twice as high as the estimate for a nuclear or biological attack during the same period. . . .</p> <p>"The survey responses suggest that the estimated combined risk of a WMD attack over five years is as high as 50 percent. Over ten years, this risk expands to as much as 70 percent."</p> <p>(Discussion continues and uses charts from the Lugar survey.)</p>	<p>Author(s): George Willcoxon, Avi Springer, Sean West, Mark Ihimoyan, and Zaheer Maskatia</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 4, 5</p>
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16	<p>Title: Trends in Illicit Movement of Nuclear Materials, Hearing before the Subcommittee on Prevention of Nuclear and Biological Attack of the Committee on Homeland Security, House of Representatives</p> <p>Publication (Publisher): Hearing (US House of Representatives)</p> <p>Link: https://www.govinfo.gov/content/pkg/CHRG-109hhr31781/pdf/CHRG-109hhr31781.pdf</p> <p>Quote: "Mr. SCHWEITZER. I will go first, because I spoke to that issue. Senator Lugar ran a survey of 85 experts, and the consensus of those experts was that, within 10 years, there is a 50 percent chance. I think they were probably a little bit—I think they were too optimistic, myself."</p> <p>"Mr. SHAYS. Optimistic—</p> <p>"Mr. SCHWEITZER. I think the percentage is higher than 50 percent.</p> <p>"Mr. JUZAITIS. I have no basis of making a mathematical assessment of that nature. I think the kinds of things that we are talking about don't lend themselves to stochastic analysis, statistical analysis. There are too many human factors involved, performance factors involved."</p>	<p>Author(s): Various</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 13, 14</p>
17	<p>Title: Use of Nuclear and Radiological Weapons by Terrorists?</p> <p>Publication (Publisher): <i>International Review of the Red Cross</i> journal article (Cambridge University Press on behalf of the International Committee of the Red Cross)</p> <p>Link: https://international-review.icrc.org/sites/default/files/irrc_859_5.pdf</p> <p>Quote: "In contrast to the nuclear weapon case, we conclude from our study that there are in principle no insurmountable obstacles to the acquisition and use of radiological weapons by a well-organized terrorist group, even though such an action remains high-tech and thus very difficult. Experts estimate the probability of such an attack occurring within the next 10 years at 40%. Most countries do not have comprehensive programmes for the management of an RDD attack. These would include public education, first responder preparedness and standards defining the levels of contamination we can live with if that attack were to occur. Should the experts' estimate be correct, contingency action is urgently needed to prevent panic and mitigate the possible consequences of such an event."</p>	<p>Author(s): Christoph Wirz and Emmanuel Egger</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2005</p> <p>Survey Question(s) Referenced: 14</p>
18	<p>Title: "Dirty Bomb" Attack: Assessing New York City's Level of Preparedness from a First Responder's Perspective</p> <p>Publication (Publisher): Thesis (Naval Postgraduate School)</p> <p>Link: https://apps.dtic.mil/sti/citations/ADA445265</p> <p>Quote: "Perhaps the most compelling case made for the probability of an RDD attack is put forth in a 2005 survey conducted by U.S. Senator Richard G. Lugar, chairman of the Senate Foreign Relations Committee. The survey polled a group of leading national security experts on various WMD proliferation issues. In comparison to the threat of a chemical, biological, or nuclear attack on a major city, the survey group found . . . the risk of a radiological attack as significantly higher. The median and average estimates of risk were 25% and 27.1% respectively over the next five years. Over ten years, both the median and the average estimate of risk jumped to 40%. The median estimate of the probability of a radiological attack over ten years was twice as high as the estimate for a nuclear or biological attack during the same period."</p>	<p>Author(s): John Sudnik</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 13, 14</p>
19	<p>Title: A Descriptive Analysis of Montana Nurse Volunteers for the Montana Nurse Alert System</p> <p>Publication (Publisher): Thesis (Montana State University)</p> <p>Link: https://scholarworks.montana.edu/items/bf3e3735-1a9b-424c-b0da-18118824cafa</p> <p>Quote: "The threat of future terrorist attacks is growing quickly. Senate Foreign Relations Committee chairman Richard Lugar (R-Ind) conducted a survey on Weapons of Mass Destruction (WMD) attacks and subsequently reported that experts predict a nearly 30% chance of a nuclear attack on United States' (US) soil in the next ten years. 'The estimated combined risk of a WMD attack over five years is as high as 50%. Over ten years this risk expands to as much as 70%' (Lugar, 2005, p. 6)."</p>	<p>Author(s): Lianna Mary Danielson</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 5</p>

20	<p>Title: A Mathematical Model of the Risk of Nuclear Terrorism</p> <p>Publication (Publisher): <i>The Annals of the American Academy of Political and Social Science</i> journal article (Sage)</p> <p>Link: https://journals.sagepub.com/doi/abs/10.1177/0002716206290182</p> <p>Quote: "(By chance, the 29 percent over ten years estimate in this numerical example is identical to the average estimate of the probability of a nuclear attack over the next ten years in a poll of selected international security experts by Senator Richard Lugar in 2005.)"</p>	<p>Author(s): Matthew Bunn</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 5</p>
21	<p>Title: Chemical and Biological Warfare Developments and Arms Control</p> <p>Publication (Publisher): <i>SIPRI Yearbook: Armaments, Disarmament, and International Security</i> book (Stockholm International Peace Research Institute)</p> <p>Link: https://www.sipri.org/sites/default/files/YB06%20707%2014.pdf</p> <p>Quote: "A survey of proliferation threats and responses which summarized returns from 85 international security experts was published by Richard Lugar, Chairman of the Senate Foreign Relations Committee. Asked to give an assessment of the probability of a biological terrorist attack inflicting numerous casualties in the next five years, the average response was 19.7 per cent with the median response being 10 per cent. When the period was extended to 10 years the average response was 32.6 per cent with the median response being 20 per cent. The equivalent response figures for similar questions on the probability of a major chemical weapon terrorist attack were on average 20.1 per cent (median 15 per cent) over 5 years and on average 30.5 per cent (median 15 per cent) over 10 years."</p>	<p>Author(s): Richard Guthrie, John Hart, and Frida Kuhlau</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 9, 10, 11, 12</p>
22	<p>Title: Federal Policy Responses to the 9/11 Attacks: An Assessment of the Policy Making Process since September 11, 2001</p> <p>Publication (Publisher): Thesis (Duquesne University)</p> <p>Link: https://dsc.duq.edu/cgi/viewcontent.cgi?article=1645&context=etd</p> <p>Quote: "Finlay concludes, in his report, that 'the proven cost-effectiveness of threat reduction programs, combined with the urgency of the threat, makes it imperative that the United States government overcome the necessary obstacles to accelerate the programs.'"</p> <p>"According to the Lugar Survey on Proliferation Threats and Responses published in June of 2005, the possibility of an attack on the United States using nuclear weapons or any other weapon of mass destruction is increasing. 'The median estimate of the risk of a nuclear attack during the next 5 years was 10%. The average estimate was 16.4%. The risk associated with an attack more than doubled if the time frame was increased to ten years. Furthermore, a strong consensus indicates that if a nuclear attack does occur, more experts believe that it will be done by a terrorist group, not a state actor. 'Underscoring the need to safeguard and account for all nuclear weapons and material, almost 79% of respondents (67 of 85) said that if a nuclear attack occurs during the next ten years, it is more likely to be carried out by a terrorist group than by a government.'"</p> <p>"Additionally, the survey attempted to determine the most likely method of acquisition for a terrorist organization to acquire nuclear materials or weapons. According to the survey, a black market purchase was the most likely means through which terrorists would acquire nuclear weapons or weapons grade material. About three quarters (63 of 83) of respondents selected 'black market purchase' either exclusively or in combination with one of the other responses. The probability that a current nuclear weapons state might deliberately transfer nuclear weapons or materials directly to a terrorist organization was seen as the least likely method or approximately less than 10%. This analysis indicates that the likelihood of nuclear attack is greater now than it has been in the past and that there is greater likelihood that a terrorist organization will acquire the weapons through theft. This is significant because if a terrorist organization were to acquire a nuclear weapon or nuclear material the likelihood that they would use it against a target in United States is significant."</p>	<p>Author(s): Ian J. Harlow</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 1, 2, 6, 7</p>

23	<p>Title: Improving Verification: Trends and Perspectives for Research</p> <p>Publication (Publisher): Chapter in <i>Verifying Treaty Compliance: Limiting Weapons of Mass Destruction and Monitoring Kyoto Protocol Provisions</i> book (Springer)</p> <p>Link: https://link.springer.com/chapter/10.1007/3-540-33854-3_29</p> <p>Quote: "The recent terrorist attacks highlighted the need to keep close controls on nuclear materials and radioactive materials that could be misused by terrorist groups. The scenarios cover attacks on facilities that could lead to radioactivity being widely spread, crude nuclear weapons production or the development of so-called dirty bombs or the radioactive contamination of supply chains with the objective to threaten the health of citizens. This area includes the fight against illicit trafficking of nuclear materials and the development of technical tools to trace potential transfer routes and the origin of nuclear materials. "A recent survey issued by Lugar about the possibilities of an attack based on nuclear, biological or chemical weapons shows that there is a real risk."</p>	<p>Author(s): Roland Schenkel</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: None</p>
24	<p>Title: Memorandum from Professor John Baylis</p> <p>Publication (Publisher): Memorandum, Select Committee on Defence Written Evidence (United Kingdom Parliament)</p> <p>Link: https://publications.parliament.uk/pa/cm200506/cmselect/cmdfence/986/986we16.htm</p> <p>Quote: "One useful source for this debate is <i>The Lugar Survey On Proliferation: Threats and Responses</i> published in June 2005. This report is based on 85 responses to a Survey on the Proliferation of Weapons of Mass Destruction. The responses came from a wide range of international experts from a variety of fields, including scholars, policy makers, diplomats and technicians. In particular, they were asked about nations that would be added to the nuclear club in the next five, 10 and 20 years and the risks of nuclear, biological, chemical and radiological attack during the same time periods. The final Report was produced by Senator Richard Lugar, the Chairman of the US Senate Foreign Relations Committee. Senator Lugar has a respected reputation on matters relating to the proliferation of weapons of mass destruction. "What follows highlights some of the findings of this poll of experts.</p> <ul style="list-style-type: none"> • 'There was broad agreement within the group that nuclear weapons will proliferate to new countries in the coming years. Estimates of how many countries would be added to the nuclear club over the next five and 10 years were extremely consistent. Large majorities judged that one or two new nuclear nations would be added during the next five years and that two to five would be added during the next 10 years. Answers diverged somewhat when the group was asked to estimate how many nuclear states would emerge over 20 years, but almost three quarters estimated a number between four and 10. • The average estimate of a nuclear attack occurring 'somewhere in the world' in the next five years was 16.4%, rising to 29% in the next 10 years. • The estimates of the risks of a biological or chemical attack during the same periods was judged to be comparable to, or slightly higher than, the risk of a nuclear attack. The risk of a radiological attack, however, was seen as significantly higher. The average risk was 27% over the next five years and as high as 40% over the 10 year period. • The survey responses suggested that the estimated combined risk of a WMD attack over five years is 50% and over a 10 year period it was as high as 70%. • It was argued that there was also, 'strong though not universal, agreement that a nuclear attack is more likely to be carried out by a terrorist than by a government in the next 10 years.' • 'There was a split 45% to 55% on whether terrorists were more likely to obtain an intact working nuclear weapon or manufacture one after obtaining weapons grade nuclear material.' • Perhaps not surprisingly one of the most immediate concerns amongst those polled was the nuclear ambitions of North Korea and Iran. One participant noted that Iran's programme 'will have a highly destabilising impact on the region, and accelerate similar efforts by Egypt, Syria, Saudi Arabia, Algeria and other regimes.' • Senator Lugar himself argues that the findings of this Survey reinforce the need to 'strengthen non-proliferation efforts, improve safeguards around existing weapons and materials, bolster intelligence gathering and interdiction capabilities, and expand international co-operation in dealing with a threat that should deeply concern all governments and peoples.' The implication of this is that if these measures can be introduced the scale of the threat from the proliferation of weapons of mass destruction can be reduced. To what extent this might be possible is not discussed. It should be noted, however, that the utility of the Non-proliferation treaty appears to be in significant decline. <p>"These estimates no doubt can, and will, be questioned given the uncertainties and assumptions surrounding any attempt to predict the future. What is clear, however, is that although UK policies will have some impact on the process of proliferation, that impact will be very limited indeed. This is not to say that the government should not play a significant role in trying to stem the tide of proliferation. Clearly it should. No doubt, a decision to develop a new generation of nuclear weapons or to extend the life of the Trident force, will be seen by some states and non-state actors (as well as domestic opponents of nuclear weapons) as hypocritical."</p>	<p>Author(s): John Baylis</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 6, 8</p>

25	<p>Title: Psychological Issues in a Radiological or Nuclear Attack</p> <p>Publication (Publisher): Chapter in <i>Medical Consequences of Radiological and Nuclear Weapons</i> book (US Department of Defense)</p> <p>Link: https://medcoeckapwstorprd01.blob.core.usgovcloudapi.net/pfw-images/dbimages/Nuke%20Warfare-ch08.pdf</p> <p>Quote: "Creating an RDD weapon, such as a dirty bomb, would require only modest financial resources and technical skills. Furthermore, only a limited geographic reach would be needed. According to Ferguson et al:</p> <p style="padding-left: 40px;">Widespread access to radioactive sources essentially obviates the need for a multinational network. An RDD may be effectively delivered via a conventional bomb packed with radioactive material or through other dispersion modes. . . . The relative ease of delivery of an RDD makes it a viable option for smaller groups with limited financial resources and technical know-how.</p> <p>"The ease of creating a radiological weapon is one reason several expert assessments have concluded that a radioactive dirty bomb or other form of radiological terrorism could be close to the top of the list of likely attacks in the future. As noted earlier, the capacity of a dirty bomb or other form of radiological terrorism to cause fatalities is limited. However, because radiological weapons can spread radioactive materials and expose people to radiation, they have the potential to sow fear, engender terror, create mass disruption, and leave enormous economic, social, and psychological impacts in their wake."</p>	<p>Author(s): Steven M. Becker</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 13, 14</p>
26	<p>Title: Soft Power Meets the Bomb: The EU and Non-proliferation</p> <p>Publication (Publisher): Conference paper (Political Studies Association of Ireland Annual Conference)</p> <p>Link: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=509dee77e60efd1a589d8ac52713d55eee01b2d6</p> <p>Quote: "The likelihood and extent of the threat posed by WMD terrorism is a matter of some debate. Some, especially in the US, argue that WMD terrorism, in particular nuclear or biological terrorism is a very real possibility, would give terrorists the potential to kill or threaten to kill millions of people and is therefore amongst the most serious threats to the US and other states. Senator Richard Lugar, Chairman of the US Senate Foreign Relations Committee, for example, has argued that 'for the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction' (Lugar, 2005: 3). Others argue that there are very serious technical obstacles to true mass casualty terrorism, that it is far from clear that terrorists would engage in such activity even if they had the capacity to do so and the threat of nuclear and biological terrorism has therefore been exaggerated. Obstacles to the procurement/development of nuclear weapons by terrorists include the likely unwillingness of states to transfer or sell a complete nuclear weapon to a terrorist group, the difficulty of obtaining sufficient fissile material for a nuclear weapon and the technical problems of assembling even a crude nuclear weapon. While terrorist groups are probably more likely to be able to obtain chemical or biological materials, there are major obstacles to successfully dispersing these over a large area such as a major city."</p>	<p>Author(s): Andrew Cottey</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: None</p>
27	<p>Title: Reinvigorating the Nuclear Nonproliferation Regime</p> <p>Publication (Publisher): <i>Issues & Insights</i> article in series on Strengthening the Global Nonproliferation Regime: Views from the Next Generation (Pacific Forum CSIS, Young Leaders Program)</p> <p>Link: https://pacforum.org/wp-content/uploads/2019/02/issuesinsights_v06n07.pdf</p> <p>Quote: "The third shortcoming has to do with a pillar of the NPT – disarmament. The NPT does not have an end-date or even a timeframe for disarmament. The U.S. and the Soviet Union (now Russia) have significantly decreased their nuclear arsenals, but in 2002 the U.S. had 11,000 warheads and Russia had 19,500 warheads. In the Lugar Survey on Proliferation Threats and Response (June 2005), WMD and nonproliferation experts believed that one to three nations would be added to the nuclear club in the next five years, a majority thought that one to five countries in the next 10 years, and one to 10 in the next 20 years. So, under the current framework a handful of NNWS would become de facto nuclear states, which would violate their NPT obligations. This would create a bigger crisis than the current Iran and North Korea situation. The Iran and DPRK regimes can be written off as anti-international society. But additional signatories falling to the nuclear weapons wayside brings into question the effectiveness and utility of the NPT regime itself."</p>	<p>Author(s): Sun Namkung</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 1, 2, 3</p>

28	<p>Title: The Terrorist Threat and Its Implications for Sensor Technologies</p> <p>Publication (Publisher): <i>Advances in Sensing with Security Applications</i>, part of the <i>NATO Security through Science</i> book series (Springer)</p> <p>Link: https://doi.org/10.1007/1-4020-4295-7_02</p> <p>Quote: "Bolton's opinion was bolstered in June 2005 by Senator Richard Lugar's survey of 85 non-proliferation and national security analysts from the United States and other nations. It was designed in part to characterize the risks related to the terrorist use of CBRN. The survey revealed that experts believe the probability of an attack somewhere in the world with a CBRN weapon was 50% over the next five years and 70% over the next ten. An attack with a radiological weapon was seen as the most probable with the likelihood of an attack with a nuclear or biological weapon considered about half as plausible. The average probability of a nuclear attack in the next ten years was nearly 30%, with experts almost evenly divided between terrorist acquisitions of a working nuclear weapon versus self-construction. The average risk estimate over ten years for major chemical and biological attacks was 20%. Senator Lugar concluded "The bottom line is this: for the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction."</p>	<p>Author(s): Jennifer L. Brower</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2006</p> <p>Survey Question(s) Referenced: 13, 14, 5, 8, 10, 12</p>
29	<p>Title: A Preliminary Multihazard Risk Profile for New York State</p> <p>Publication (Publisher): Presentation (University at Buffalo)</p> <p>Link: https://www.eng.buffalo.edu/mceer-reports/07/07-SP01.pdf</p> <p>Quote: "Because of rapidly-changing conditions and changes in the capabilities of US homeland security, terrorism deserves special attention. Historic frequencies are an insufficient basis for judging terrorism likelihoods, thus expert estimates of future probabilities were also examined.</p> <p>"The Lugar Survey on Proliferation Threats and Responses places the probability of an event—like 9/11—anywhere in the world at 50% within the next 5 years (Lugar, 2005).</p> <p>"In another study by the Center for American Progress study, 35 out of 100 experts agree that a disaster with the magnitude of 9/11 will occur within the next year somewhere in the US. In the same group of experts—79 believe that it will happen in the next 5 years. Fifty-seven out of 100 think that a disaster on the scale of the London bombing will occur in the next year. . . .</p> <p>"Terrorism risk cannot be estimated based on historical frequency alone. A Terrorism Risk Insurance Act was recently passed, forcing insurance companies to estimate terrorism loss. . . .</p> <p>"Limitations arise from the inconsistent sources and estimation methodologies on which the MIPT database depends. The likelihood of a catastrophic event—that would most likely have raised our risk score—was unable to be estimated.</p> <p>"Finally, the propensity for terrorism is constantly changing, various non-state groups change in their intentions and capacities. US Homeland Security is changing. For these reasons, terrorism risk estimates should be regularly reviewed."</p>	<p>Author(s): Lindsay Allen, Mellissa Fratello, Julie Gotham, Hao Huang, Elea Mihou, Jody Pollot, Pavan Yadav, and Carol Yamarino</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: None</p>

30	<p>Title: A Review of U.S. International Efforts to Secure Radiological Materials, Hearing before the Oversight of Government Management, the Federal Workforce, and the District of Columbia Subcommittee of the Committee on Homeland Security and Governmental Affairs</p> <p>Publication (Publisher): Hearing (US Senate)</p> <p>Link: https://www.govinfo.gov/content/pkg/CHRG-110shrg34410/pdf/CHRG-110shrg34410.pdf</p> <p>Quote: "Now, the intent of terrorists to acquire radioactive materials for use in an RDD does pose a significant risk to the American public and must be addressed. One of the many lessons learned from the attacks of September 11 is that some of the most common tools used in our daily lives, such as commercial airliners, can and will be used by terrorists in an attempt to wreak havoc on the United States. Should terrorists acquire and use these materials in an RDD, the psychological, physical, and economic impact could be significant.</p> <p>"From various reports, we know that al Qaeda is known to be interested in acquiring the materials for a radiological weapon. We would add that in June 2005, Senator Lugar polled dozens of non- proliferation experts around the world, and the Lugar survey concluded that the probability of a radiological attack was twice as high as the probability of other WMD attacks using biological or nuclear materials. Therefore, given the reality of this situation, the Department of Energy, this Administration, and Congress have taken important steps to increase our radiological threat reduction efforts.</p> <p>"So to address this threat, in 2004 the Department of Energy consolidated its radiological threat reduction efforts into a single central office called the Global Threat Reduction Initiative. GTRI is a vital part of the President's National Security Strategy, and GTRI directly addresses and is implementing some of the recommendations of the bipartisan 9/11 Commission."</p>	<p>Author(s): Various</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 14, 10, 12, 5</p>
31	<p>Title: Assessing, Managing and Benefiting from Global Interdependent Risks: The Case of Terrorism and Natural Disasters</p> <p>Publication (Publisher): Conference paper (2007 CREATE Symposium)</p> <p>Link: https://www.researchgate.net/profile/Erwann-Michel-Kerjan/publication/237288372_Assessing_Managing_and_Benefiting_from_Global_Interdependent_Risks_The_Case_of_Terrorism_and_Natural_Disasters/links/544fb34e0cf2279b80c228f0/Assessing-Managing-and-Benefiting-from-Global-Interdependent-Risks-The-Case-of-Terrorism-and-Natural-Disasters.pdf</p> <p>Quote: Citation only, no quote</p>	<p>Author(s): Howard Kunreuther and Erwann Michel-Kerjan</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: None</p>
32	<p>Title: Cooperative Nonproliferation: Getting Further, Faster</p> <p>Publication (Publisher): Monograph (Stimson Center)</p> <p>Link: https://www.stimson.org/wp-content/files/file-attachments/CNP%20Monograph%20(For%20Printers).pdf</p> <p>Quote: Citation only, no quote</p>	<p>Author(s): Brian D. Finlay and Elizabeth Turpen</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: None</p>
33	<p>Title: Evaluating the Effectiveness of Terrorism Risk Financing Solutions</p> <p>Publication (Publisher): Working paper (National Bureau of Economic Research)</p> <p>Link: https://www.nber.org/papers/w13359</p> <p>Quote: "As a point of reference, a 10-kiloton nuclear bomb planted in a shipping container that explodes in the port of Long Beach, California, could inflict total direct costs estimated to exceed \$1 trillion, not to mention the ripple effects on trade and global supply chains that could even produce a global recession.</p> <p>"Are these scenarios likely? According to experts in nuclear security and non-proliferation, they might very well be. A 2005 survey of 85 non-proliferation and national security experts led by Senator Richard Lugar put the likelihood of a nuclear attack somewhere in the world within the next ten years at 20 percent and the likelihood of a radiological attack at 40 percent (Lugar, 2005, p. 6). It should be noted, however, that the report does not focus on the likelihood of attacks on any specific country."</p>	<p>Author(s): Howard Kunreuther and Erwann Michel-Kerjan</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 5, 14</p>

34	<p>Title: Forging a Framework to Improve the Emergency Management Community's Ability to Respond to a Nuclear or Radiological Weapons Attack</p> <p>Publication (Publisher): Thesis (Naval Postgraduate School)</p> <p>Link: https://apps.dtic.mil/sti/citations/ADA467214</p> <p>Quote: "In a 2003 interview, Rosenau and Treverton downplay Al Qaeda's ability and willingness to acquire Weapons of Mass Destruction due primarily to the risk involved in acquiring such weapons especially when existing conventional weapons are so cheap and effective. Despite some disagreements, however, a survey conducted of over 80 leading nuclear proliferation experts by Senator Richard Lugar in 2005 found that the near-term risk of a radiological (RDD) attack is significantly higher than the risk of a nuclear (IND) attack."</p>	<p>Author(s): Patrick Massey</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 13, 4</p>
35	<p>Title: Intelligence Power and Prevention after 9/11: The Role of Intelligence in Facilitating and Legitimising Controlling Security Strategies of the UK, US and UN</p> <p>Publication (Publisher): Dissertation (London School of Economics)</p> <p>Link: https://search.proquest.com/openview/36023b4b5d1c1274e187f997778ca24c/1?pq-origsite=gscholar&cbl=51922</p> <p>Quote: "In June 2005, the Lugar Survey on Proliferation Threats and Responses, authored by US Senator Richard G. Lugar, was published. The purpose of the survey was to investigate ways to strengthen the non-proliferation regime in the face of the 'new' terrorism threat, especially in recognition of the existence and potential impact of the A.Q. Khan proliferation network. The Lugar Survey was predicated on the notion that the international community 'must anticipate that terrorists will use weapons of mass destruction if allowed the opportunity', and concluded that the bottom line for the US and other states is that they 'face an existential threat from the intersection of terrorism and weapons of mass destruction'.</p> <p>"The survey, which posed questions to an international group of over 85 experts in the field of WMD proliferation, sought to 'discover consistencies and divergences in attitudes' about future WMD threats. Survey responses to questions addressing the terrorism-WMD threat nexus painted an interesting picture of future trends. For instance, given the choice between 'terrorists' and 'government', 67 out of the 85 respondents answered that if a nuclear attack occurs during the next ten years, it is more likely to be carried out by a terrorist group than by a government. Furthermore, in answer to the question 'What is the most likely method for terrorists to acquire nuclear weapons or material?' 63 out of the 83 respondents selected a method involving the black market, either exclusively or in combination with state assistance or crime (theft). Other than the threat of nuclear terrorism, the survey group concluded that the proliferation threat in most need of attention is 'the possible terrorist use of chemical and biological weapons'.</p> <p>"The results of the Lugar Survey signaling a terrorism-WMD threat nexus chime with the conclusions of other experts in the field of WMD proliferation. In terms of terrorist acquisition of WMD through a combination of the black market and state assistance, the CIA has reported that WMD-capable states 'may follow North Korea's practice of supplying specific WMD-related technology and expertise to other countries or non-state actors.' On the other hand, the US Congressional Research Service Report 'Globalizing Cooperative Threat Reduction: A Survey of Options' outlines the danger of state sponsors of terrorism providing 'the terrorist organisations that they support with WMD materials or weapons.' The severity of the terrorism-WMD threat nexus, the report continues, depends on whether terrorist groups that have the intention of acquiring WMD, such as al-Qaida, are presented with the opportunity of gaining access the nuclear materials or weaponry, whether through theft, purchase or assistance from states or black market profiteers."</p>	<p>Author(s): Chris Mackmurdo</p> <p>Perspective on the Lugar Survey: Explicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 18, 20, 6, 20</p>

36	<p>Title: Maritime Security: Potential Terrorist Attacks and Protection Priorities</p> <p>Publication (Publisher): CRS report for Congress (Congressional Research Service)</p> <p>Link: https://sgp.fas.org/crs/homesecc/RL33787.pdf</p> <p>Quote: "Although much attention is paid to the threat of nuclear terrorism, there are divergent opinions about the likelihood of a terrorist group such as al Qaeda constructing or otherwise obtaining a workable nuclear weapon. Expert estimates of the probability of terrorists obtaining a nuclear device have ranged from 50% to less than 1%. Among other challenges to obtaining such a device, experts believe it unlikely that countries with nuclear weapons or materials would knowingly supply them to a terrorist group. It also may be technically difficult to successfully detonate such a nuclear device. North Korea experienced technical failures in conducting its 2006 nuclear weapons test, and this test took place under highly controlled conditions. Attempting to detonate a nuclear device in a maritime terror attack could pose even greater operational challenges. Consistent with these perspectives, Secretary of Homeland Security Michael Chertoff has stated, 'I don't think that in the near term there's a significant likelihood of a traditional nuclear device being detonated' in the United States. . . .</p> <p>"Many terrorism analysts view such a dirty bomb attack as relatively likely. In a 2005 survey, for example, nuclear non-proliferation experts expressed their beliefs (on average) that there was a 25% chance of a dirty bomb attack in the United States by 2010 and a 40% chance of such an attack by 2015. Studies suggest that the materials required to make a dirty bomb may be widely available and poorly controlled internationally. According to some press reports, U.S. and British intelligence agencies have reportedly concluded that Al Qaeda has succeeded in making such a bomb."</p>	<p>Author(s): Paul W. Parfomak and John Frittelli</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 8, 7, 13, 14</p>
37	<p>Title: Preventing Nuclear Terrorism in Pakistan: Sabotage of a Spent Fuel Cask or a Commercial Irradiation Source in Transport</p> <p>Publication (Publisher): Paper (Stimson Center)</p> <p>Link: https://www.files.ethz.ch/isn/105524/VFMannan.pdf</p> <p>Quote: "However, most of the nuclear facilities around the world, including in the US, would not be able to provide a reliable defense against attacks as large as terrorists have already proved that they can mount. According to the Lugar Survey, the possibility of a WMD attack against a city or other target somewhere in the world is real and increasing over time. The median estimate of the probability of a radiological attack over ten years was twice (40%) as high as the estimate for a nuclear or biological attack during the same period. Thus a strategy should reduce the consequences of those nuclear attacks that are the most likely and limit the probability of attacks with the highest consequences.</p> <p>"Given the above considerations, the present paper briefly reviews Pakistan's vulnerability to nuclear terrorism and the consequences during movement of radioactive materials through two possible hypothetical case studies. The first is a successful terrorist attack on Spent Nuclear Fuel (SNF) during transportation and shipment. This scenario is less probably because of expected physical protection measures and SNF shipments are not anticipated in the near future in Pakistan. The second is the more likely of the two, a terrorist attack on high activity radioactive sources being transported within Pakistan."</p>	<p>Author(s): Abdul Mannan</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 14, 10, 5</p>
38	<p>Title: Reducing Vulnerabilities to Weapons of Mass Destruction</p> <p>Publication (Publisher): Defense Science Board 2005 Summer Study Report (US Office of the Under Secretary of Defense)</p> <p>Link: https://dsb.cto.mil/reports/2000s/ADA471566.pdf</p> <p>Quote: "Combating terrorist use of WMD requires foresight and action. . . .</p> <p>"Figure 2 portrays some interesting survey results—opinions of more than 100 national security and nonproliferation experts—that serve to highlight the changing nature of today's threat. The results are somewhat surprising, in fact—at least in terms of the severity of the threat and how it is characterized. . . . Over half of those responding believe the probability will be greater than 30 percent over the next decade. That response is 10 or 100 times what we used to think the likelihood of a nuclear event might be (often described as 'high consequence, low probability' a few years ago).</p> <p>"Nearly 80 percent of those responding believe that terrorists would most likely be responsible if a nuclear attack were to occur in the next 10 years (top right); only 21 percent believe that the government of a nation-state would be responsible. . . . Thus, securing radiological material everywhere in the world should be a high priority if one agrees with these experts."</p>	<p>Author(s): Defense Science Board panel</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 5, 6, 14, 10, 12, 3</p>

39	<p>Title: Report of the DHS National Small Vessel Security Institute</p> <p>Publication (Publisher): Report (US Department of Homeland Security)</p> <p>Link: https://apps.dtic.mil/sti/citations/ADA480860</p> <p>Quote: "Radiological and nuclear (RAD/NUC) weapons are two types of WMD of high concern. Not only do they have the potential to do tremendous damage, but they may be easily concealed as they can be relatively small—small enough to be carried onboard a small vessel.</p> <p>"Senator Richard G. Lugar summed up the WMD concern in <i>The Lugar Survey on Proliferation Threats and Responses</i>. 'The September 11 attacks do not come close to approximating the destruction that would be unleashed by a nuclear weapon. Weapons of mass destruction have made it possible for a small nation, or even a sub-national group, to kill as many innocent people in a day as national armies killed in months during World War II.'</p> <p>"How might terrorists obtain a nuclear weapon? They might buy or steal a nuclear warhead. Or they might acquire the components of a nuclear weapon and try to assemble their own improvised nuclear device (IND). Analysts believe that due to the dissolution of the former Soviet Union and the spread of its nuclear technology to other states, these scenarios are becoming more plausible."</p>	<p>Author(s): Charles Brownstein, John Baker, Peter Hull, Nicholas Minogue, George Murphy, and Phyllis Winston</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: None</p>
40	<p>Title: Securing the Bomb 2007</p> <p>Publication (Publisher): Report (Nuclear Threat Initiative, Harvard University)</p> <p>Link: https://www.nti.org/wp-content/uploads/2007/09/securing-the-bomb-2007-fullreport.pdf</p> <p>Quote: "Nuclear terrorism is a danger to every citizen of every country on earth. No one knows for sure how big the risk is. Well-informed analysts have made estimates of the probability of a terrorist attack with a nuclear explosive that range from 1% to over 50% over the next decade.</p> <p>"Both Graham Allison and former secretary of Defense William Perry have put the probability of a terrorist nuclear attack within the next decade at about 50 percent. . . . For a poll of leading national security and foreign policy experts on this and related points, see Richard G. Lugar, <i>The Lugar Survey on Proliferation Threats and Responses</i>. . ."</p>	<p>Author(s): Matthew Bunn</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: none</p>
41	<p>Title: The Global Context for Preventing Radiological Terrorism</p> <p>Publication (Publisher): Chapter in <i>U.S.–Russian Collaboration in Combating Radiological Terrorism</i> book (National Academies Press)</p> <p>Link: https://nap.nationalacademies.org/read/11801/chapter/4</p> <p>Quote: "[R]espondents [to a poll] judged the probability of a major radiological attack over the next five years to be greater than the probability of a biological, chemical, or nuclear attack,' with 68 of 83 respondents saying 'there was . . . a 10 percent chance of [an] attack that affects a major portion of a city.' When the time line is extended to 10 years, '40 of 82 respondents judged the risk of such an attack as 50 percent or greater.'"</p>	<p>Author(s): Committee on Opportunities for U.S.–Russian Collaboration in Combating Radiological Terrorism, Office for Central Europe and Eurasia Development, Security, and Cooperation Policy and Global Affairs</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2007</p> <p>Survey Question(s) Referenced: 13, 9, 11, 14</p>

42	<p>Title: A Decision Tree Model for Evaluating Countermeasures to Secure Cargo at the United States Southwestern Ports of Entry</p> <p>Publication (Publisher): <i>Decision Analysis</i> journal article (Institute for Operations Research and the Management Sciences [INFORMS])</p> <p>Link: https://doi.org/10.1287/deca.1080.0124</p> <p>Quote: "The threat of dangerous cargo entering the United States has intensified since 2001. Experts contend that containers and trucks may be used to bring radioactive and nuclear material into the United States. A radiological dispersion device (RDD, or a 'dirty bomb') or a nuclear attack upon critical infrastructure around populous urban centers could be devastating to the U.S. economy, and render high casualties. According to a survey of national security and nonproliferation experts compiled by U.S. Senator Richard G. Lugar in 2005, the median probability of a nuclear attack somewhere in the world is 0.1 and 0.2 in the next 5 and 10 years, respectively. For an RDD, these figure jump to 0.25 and 0.4. As the global black market and list of countries with nuclear capabilities expand, the risk of terrorism will increase."</p>	<p>Author(s): Niyazi Onur Bakir</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: 4, 5, 13, 14</p>
43	<p>Title: Overview of Issues in Radiological Emergency Planning</p> <p>Publication (Publisher): Presentation (California Department of Public Health)</p> <p>Link: https://web.archive.org/web/20101228104233/http://www.cchealth.org/groups/hazmat/pdf/hit_rad_02_2008.pdf</p> <p>Quote: The slide titled "It May Be Worse Than We Think, The Lugar Survey, 2005, Proliferation Threats and Responses" includes the Lugar survey charts on the probability of nuclear attack occurring in the next five years and ten years. The next slide says, "And lots of 'small' Nucs are already out there!"</p>	<p>Author(s): James Thomas</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: 4, 5</p>
44	<p>Title: Catastrophic Nuclear Terrorism: A Preventable Peril</p> <p>Publication (Publisher): Chapter in <i>Global Catastrophic Risks</i> book (Oxford)</p> <p>Link: https://doi.org/10.1093/oso/9780198570509.003.0026</p> <p>Quote: "For an extended review of expert opinions on various proliferation and terrorist threats—although not precisely the issue of use of a nuclear explosive, see Lugar (2005)."</p>	<p>Author(s): Gary Ackerman and William C. Potter</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: None</p>
45	<p>Title: Improving Hospital Preparedness for Radiological Terrorism: Perspectives from Emergency Department Physicians and Nurses</p> <p>Publication (Publisher): <i>Disaster Medicine and Public Health Preparedness</i> journal article (Cambridge University Press)</p> <p>Link: https://doi.org/10.1097/DMP.0b013e31817dcd9a</p> <p>Quote: "A 2006 survey of 117 foreign policy experts ranked terrorism involving radioactive materials as the second most likely threat facing the United States in the coming years, with only suicide bombings perceived as more likely. Similarly, a 2005 survey of 85 experts in the field put radioactive dirty bombs at the top of the list of potential chemical, biological, or radiological threats. This growing concern is reflected in national planning and training. Two of the 15 national planning scenarios developed by the US Department of Homeland Security to guide preparedness efforts involve radioactive materials, and the 'Topoff 4' national preparedness exercise held in October 2007 focused specifically on radiological terrorism."</p>	<p>Author(s): Steven M. Becker and Sarah A. Middleton</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: 10, 12, 14</p>

46	Title: It's a Long Road to Disarmament Publication (Publisher): News (<i>The Indian Express</i>) Link: https://web.archive.org/web/20200221004721/http://archive.indianexpress.com:80/news/it-s-a-long-road-to-disarmament/319709 Quote: "Of late there has been a renewed interest in nuclear disarmament, following two articles, the first one in early 2007 and the second one in early 2008, on the same subject, by George Shultz, William Perry, Henry Kissinger and Sam Nunn in the Wall Street Journal. Since then there have a number of conferences and the issue is a hot topic for conferences. "The reasons for this renewed interest are not far to seek. The Lugar Survey on Proliferation Threats and Responses, done in early 2005 by Senator Lugar with responses from nearly a hundred internationally known non-proliferation and national security experts threw up some alarming forecasts. According to the experts surveyed, both the median and average number of new countries that would acquire nuclear weapons would be four. Presumably since this survey was done in 2005, the respondents had already factored in the non-NPT nuclear weapon states—India, Israel, Pakistan and North Korea. That would raise the number of nuclear weapon states in the future to 13. The possibility of a WMD attack against a target somewhere in the world, they said, is increasing."	Author(s): Gopalan Balachandran Perspective on the Lugar Survey: Implicitly positive	Year: 2008 Survey Question(s) Referenced: 2
47	Title: Preparing for Terrorism Involving Radioactive Materials: Three Lessons from Recent Experience and Research Publication (Publisher): <i>Journal of Applied Security Research</i> article (Taylor & Francis) Link: https://doi.org/10.1080/19361610802209865 Quote: "In considering the potential terrorism dangers facing the United States, authorities now see the risk of terrorism involving radioactive materials as significant and growing. This was underlined by the results of two recent surveys in which experts were asked to rank various terrorism threats. In one survey, the experts viewed terrorism involving radioactive materials as the second most likely possibility (behind suicide bombings), whereas in the other survey they identified radioactive materials terrorism as the top possibility (Terrorism Survey, 2006, Lugar, 2005)."	Author(s): Steven M. Becker Perspective on the Lugar Survey: Implicitly positive	Year: 2008 Survey Question(s) Referenced: 13, 14
48	Title: Probable Economic Targets for Terrorism by Radiological Attack Publication (Publisher): Research report (Air War College Air University) Link: https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=a3e21f3f9cdd654435c2970c92230b0fe7355f6a Quote: "The International Atomic Energy Commission reported that 27 cesium-137 sources were lost in Croatia in the late 1990s. However, obtaining radioactive source materials within the U.S. would sidestep the possibility of detection by radiation sensors should a terrorist attempt to bring these materials across the border or through major ports. "A panel of experts estimates the probability of an RDD attack as 25% in the 2005-2010 timeframe and 40% in the years 2005-2015. The GAO recently illustrated that acquiring the necessary radioactive materials was a rather simple matter. Senator Norm Coleman (R-Minn) requested GAO investigate lax regulation policies at the NRC. In a sting conducted July 2007, GAO investigators posed as West Virginian businessmen to obtain in under 28 days a federal license that would allow them to purchase low-level radioactive materials. The investigators were then able to easily modify the license to permit the purchase of a large number of more powerful sources. The radioactive material potentially would have been enough to build an RDD. Although the NRC has pledged to fix its procedures, the patchwork of federal and state regulations that govern the purchase of radioactive materials no doubt has other undiscovered loopholes."	Author(s): Timothy W. McBride Perspective on the Lugar Survey: Implicitly positive	Year: 2008 Survey Question(s) Referenced: 13, 14
49	Title: Radiological Dispersal Device Primer: From a Terrorists Perspective Publication (Publisher): Research report (Air War College Air University) Link: https://apps.dtic.mil/sti/citations/ADA489222 Quote: "In 2005, Senator Richard G. Lugar (IN) commissioned a survey, sending a questionnaire to 132 scholars, policy makers, diplomats, and technical experts devoted to the task of WMD non-proliferation. Eighty-five individuals responded and concluded that the risk of a WMD attack somewhere in the world is real and increasing with time. Concerning a WMD attack, the results indicated that a RDD attack is the most likely scenario." (Includes survey results as well)	Author(s): Joel T. Hanson Perspective on the Lugar Survey: Implicitly positive	Year: 2008 Survey Question(s) Referenced: 13, 14, 10, 5

50	<p>Title: Risk Analysis of Nuclear Deterrence</p> <p>Publication (Publisher): <i>The Bent</i> journal article (Tau Beta Pi)</p> <p>Link: https://www.tbp.org/pubs/Features/Sp08Hellman.pdf</p> <p>Quote: "A terrorist attack involving a nuclear weapon would be a catastrophe of immense proportions: 'A 10-kiloton bomb detonated at Grand Central Station on a typical work day would likely kill some half a million people, and inflict over a trillion dollars in direct economic damage. America and its way of life would be changed forever.'"</p> <p>"The likelihood of such an attack is also significant. Former Secretary of Defense William Perry has estimated the chance of a nuclear terrorist incident within the next decade to be roughly 50 percent. David Albright, a former weapons inspector in Iraq, estimates those odds at less than one percent, but notes, 'We would never accept a situation where the chance of a major nuclear accident like Chernobyl would be anywhere near 1%. . . . A nuclear terrorism attack is a low-probability event, but we can't live in a world where it's anything but extremely low probability.' In a survey of 85 national security experts, Senator Richard Lugar found a median estimate of 20 percent for the 'probability of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years,' with 79 percent of the respondents believing 'it more likely to be carried out by terrorist' than by a government."</p>	<p>Author(s): Martin Hellman</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: 5, 6</p>
51	<p>Title: The Economics of Nuclear Energy Markets and the Future of International Security</p> <p>Publication (Publisher): Working paper (Wharton School, University of Pennsylvania)</p> <p>Link: https://ciaotest.cc.columbia.edu/wps/isp/0002779/f_0002779_1947.pdf</p> <p>Quote: "Among the potential candidates: '[E]ven more decisive tipping would come from the use by terrorists of some form of weapons of mass destruction. (. . .) Are these thoughts more apocalyptic than realistic? History suggests not.' Emmott is not alone in this analysis. A 2005 survey of experts put the likelihood of a nuclear attack somewhere in the world within ten years at 20 percent; further survey response put the likelihood of a radiological attack at double that."</p> <p>"Thus, fears surround the spread of nuclear energy and the possible diversion of nuclear materials from the fuel cycle process—either slightly enriched uranium for a dirty bomb, or the much harder-to-handle (but more deadly) reprocessed plutonium for a nuclear bomb."</p>	<p>Author(s): Erwann O. Michel-Kerjan and Debra K. Decker</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: 5, 14</p>
52	<p>Title: The Weakest Pillar: U.S. Northern Command's Role in Solving the Federal Government's Domestic Consequence Management Problem</p> <p>Publication (Publisher): Paper submitted in partial fulfillment of academic requirements (Naval War College)</p> <p>Link: https://apps.dtic.mil/sti/pdfs/ADA494415.pdf</p> <p>Quote: "Despite President Bush's exhortations to carry on with their lives as if no attack had occurred, American citizens who are exposed to CBRNE attacks or releases will have to address the immediate hazards. The terrorist threat is real. In 2005, 85 leading experts in national security, diplomacy, military affairs, and homeland defense estimated the chance of an attack with a weapon of mass destruction somewhere in the world in the next ten years ran as high as 70 percent. The Deputy Director for Antiterrorism and Homeland Defense (J-34) on the Joint Staff analyzed the potential terrorist threats and summarized the most likely and most dangerous threats in Figure 1."</p>	<p>Author(s): Robert DeBuse</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2008</p> <p>Survey Question(s) Referenced: None</p>
53	<p>Title: Better Safe than Sorry: The Ironies of Living with the Bomb</p> <p>Publication (Publisher): Book (Stanford University Press)</p> <p>Link: https://academic.oup.com/stanford-scholarship-online/book/16931/chapter-abstract/174186024?redirectedFrom=fulltext</p> <p>Quote: "In 2005, Senator Richard Lugar polled eighty-five leading nongovernmental proliferation experts to survey their probability assessments of different types of terrorist attacks. Their median estimate of the risk of the terrorist use of a nuclear weapon somewhere in the world was 10 percent over five years and 20 percent over ten years. As for a 'dirty bomb' attack—a weapon of terror that dispersed radiological material without creating a mushroom cloud—the experts predicted a 25 percent chance over five years, jumping to 40 percent within ten years. The combined risk of any kind of attack involving weapons of mass destruction was estimated at 50 percent over five years and 70 percent over ten years. Former secretary of defense William Perry, former senator Sam Nunn, and others estimate that the probability of a nuclear weapon detonating in an American city has grown, not declined, since the 9/11 attacks."</p>	<p>Author(s): Michael Krepon</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 4, 5, 13, 14</p>

54	<p>Title: Insure to Assure: A New Paradigm for Nuclear Nonproliferation and International Security</p> <p>Publication (Publisher): <i>Innovations: Technology, Governance, Globalization</i> journal article (MIT Press)</p> <p>Link: https://direct.mit.edu/itgg/article-abstract/4/2/139/9562</p> <p>Quote: "The debate about nuclear energy and proliferation has remained essentially among representatives of governments and international organizations. Thus it has failed to take advantage of the fact that private actors can help reduce public vulnerability. Indeed, it appears that the use of nuclear energy will continue to increase in the foreseeable future. And although we have focused here on state development of nuclear materials, such development is also inextricably linked to possible terrorist use."</p>	<p>Author(s): Erwann O. Michel-Kerjan and Debra K. Decker</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: None</p>
55	<p>Title: Jihadists and Nuclear Weapons</p> <p>Publication (Publisher): Chapter in <i>Jihadists and Weapons of Mass Destruction: A Growing Threat</i> book (Taylor & Francis)</p> <p>Link: https://uploads.fas.org/2013/05/Blair_2009_Jihadists-and-Nuclear-Weapons_.pdf</p> <p>Quote: "A 2005 survey of eighty-three experts in the field of CBRN security overwhelmingly concluded 'black market purchase to be the most likely means through which terrorists would acquire nuclear weapons or weapons grade material.' While no one denies that nuclear trafficking and organized crime exist simultaneously in several regions of the world, no definitive proof has yet emerged linking the two. More importantly, 'there is no compelling evidence of a solid nexus' among nuclear trafficking, organized crime, and terrorism. In part, these uncertainties result from a lack of data collection and information sharing by various law enforcement agencies around the world and, obviously, by the fact that only known plots and incidents can be evaluated. In short, while there may be a robust nonstate nuclear black market in operation, one that ostensibly could supply jihadists with intact nuclear weapons, no known empirical evidence yet exists to support this fear."</p>	<p>Author(s): Charles P. Blair</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 2, 7</p>
56	<p>Title: Nuclear Terrorism: Assessing the Threat, Developing a Response</p> <p>Publication (Publisher): Report in Strategy for the Long Haul series (Center for Strategic and Budgetary Assessments)</p> <p>Link: https://csbaonline.org/uploads/documents/2009.04.22-Nuclear-Terrorism.pdf</p> <p>Quote: "Upon reviewing al Qaeda's longstanding interest in and efforts to acquire weapons of mass destruction in his memoir, former Director of Central Intelligence George Tenet ominously concluded, 'One mushroom cloud would change history. My deepest fear is that this is exactly what they intend.' In a 2005 survey of eighty-five national security experts conducted under the direction of Senator Richard Lugar, more than 60 percent of the respondents believed that the chance of a nuclear attack somewhere in the world over the following decade stood between 10 and 50 percent. More remarkably, nearly 80 percent of those surveyed believed that if a nuclear attack did occur within this timeframe, it would most likely be the act of a terrorist group rather than that of a government. Finally, Sam Nunn recently warned that 'The risk of a nuclear weapon being used today ... is growing and not receding.'"</p>	<p>Author(s): Evan Braden Montgomery</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 5, 6</p>
57	<p>Title: On Nuclear Terrorism</p> <p>Publication (Publisher): Teaching notes (Harvard University Press)</p> <p>Link: https://cfr.org/sites/default/files/On%20Nuclear%20Terrorism%20Teaching%20Notes.pdf</p> <p>Quote: references Lugar survey as supplementary material</p>	<p>Author(s): Michael A. Levi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: None</p>
58	<p>Title: Pakistan's HEU-Based Nuclear Weapons Programme and Nuclear Terrorism: A Reality Check</p> <p>Publication (Publisher): <i>Strategic Analysis</i> journal article (Taylor & Francis)</p> <p>Link: https://doi.org/10.1080/09700160903255863</p> <p>Quote: "In a survey conducted by Senator Richard G. Lugar of Indiana, 63 of the 83 respondents selected 'black market purchase' as the most likely means from where terrorists might obtain fissile material. Fifty-five per cent of those responding saw terrorist manufacture of a nuclear weapon after obtaining material as more likely, while 45 per cent believed that terrorist acquisition of a working nuclear weapon was the more probable scenario."</p>	<p>Author(s): Reshmi Kazi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 7, 8</p>

59	<p>Title: PALs for Pals: The US and Pakistan</p> <p>Publication (Publisher): <i>Global Tides</i> journal article (Pepperdine University)</p> <p>Link: https://digitalcommons.pepperdine.edu/globaltides/vol3/iss1/4/</p> <p>Quote: "Today, the U.S. finds itself more vulnerable to a nuclear attack than even during the Cold War. According to a recent survey by Senator Richard Lugar, the risk of a terrorist attack on a major city is actually increasing over time. But where would these terrorist attacks likely come from?"</p> <p>"Chair Joint Chief of Staff Michael Mullen claims the next terrorist attack on America is currently being planned in the 'under-governed regions' of Pakistan, where Al Qaeda has made its world headquarters. This risk is mainly due to the unstable balance of power within the country and the continuing presence of Al Qaeda and other extremists. Though some argue that Pakistan's nuclear facilities are secure, there is reason for skepticism. . . ."</p> <p>"These difficult circumstances shed light on the necessity for a more complete reform. If indeed the chance of nuclear terrorist attacks is increasing over time, as Senator Lugar's report claims, then swift reform is needed. Both legislation and international treaties are notoriously time-consuming when it comes to nuclear weapons and proliferation issues. With violent episodes continuing and increasing, both by domestic groups within Pakistan and by Pakistan-based terrorist groups in places such as Mumbai, long-winded debate over legislation may end up being a deadly waste of time."</p>	<p>Author(s): Anna McDermott</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: None</p>
60	<p>Title: Persistent Primacy and the Future of the American Era</p> <p>Publication (Publisher): <i>International Politics</i> journal article (Palgrave Macmillan)</p> <p>Link: https://doi.org/10.1057/ip.2008.44</p> <p>Quote: "Subsequently, in late June 2007, there were failed bomb attacks in central London and at Glasgow airport, and in September of that year, German police seized three Islamist terrorists planning massive bombings against targets in Germany. Moreover, no less a figure than Osama bin Laden, who had been preaching war against the United States since at least 1996, has asserted that acquisition of nuclear weapons is a sacred duty and added that al-Qaeda would be justified in killing four million Americans, half of them children. In recognition of this threat, the bipartisan 9/11 Commission stated in its unanimous report that, '[T]he catastrophic threat at this moment in history is more specific. It is the threat posed by Islamist terrorism – especially the al Qaeda network, its affiliates, and its ideology'."</p> <p>"It is also the judgment of prominent and largely non-partisan authorities on terrorism and proliferation that the use of CBRN may well occur within the next decade. For example, Robert L. Gallucci has written that, '[U]nless many changes are made, it is more likely than not that al Qaeda or one of its affiliates will detonate a nuclear weapon in a US city within the next five to ten years.' In addition, a survey of 100 foreign policy experts by Foreign Policy magazine and the Center for American Progress found that, 'More than 80 per cent expect a terrorist attack on the scale of 9/11 within a decade. . . .' Similarly, there are the responses of 85 national security and non-proliferation experts to a survey conducted by the US Senate Foreign Relations Committee staff for its then Chairman, Senator Richard Lugar of Indiana, and published in June 2005. These respondents were asked to predict the likelihood of a CBRN attack occurring anywhere in the world within the following 10 years and their average probability estimate was 29 per cent for a nuclear attack, 40 per cent for a radiological attack and 70 per cent for some kind of CBRN event."</p>	<p>Author(s): Robert Lieber</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 5, 14, 10, 12</p>
61	<p>Title: The Danger of Nuclear Terrorism: The Indian Case</p> <p>Publication (Publisher): <i>Strategic Analysis</i> journal article (Taylor & Francis)</p> <p>Link: https://doi.org/10.1080/09700160902907050</p> <p>Quote: "Al Qaida can acquire nuclear weapons or explosives by stealing or purchasing intact nuclear weapons from any state with poor security of its stockpile. It can also attempt to fabricate a bomb. Presumably, Al Qaida will opt for the latter since it is easier to obtain fissile material than to procure an intact bomb. In a survey conducted by Senator Richard G. Lugar, 63 of the 83 respondents selected 'black market purchase' as the most likely means from where terrorists might obtain fissile material. Fifty-five per cent of those responding saw terrorist manufacture of a nuclear weapon after obtaining material as more likely while 45 per cent believed that terrorist acquisition of a working nuclear weapon was the more probable scenario. In a survey conducted by the author, opinion was seen to be equally divided: the respondents believed that the possibility of terrorists' access to nuclear weapons was possible through the nuclear black market as well as through acquisition."</p>	<p>Author(s): Reshmi Kazi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 7, 8</p>

62	<p>Title: The Food System and Feeding the World</p> <p>Publication (Publisher): Blog post (<i>Terry Etherton Blog on Biotechnology</i>, Penn State)</p> <p>Link: https://sites.psu.edu/tetherton/2009/10/12/the-food-system-and-feeding-the-world/</p> <p>Quote: "Our ability to feed the world assumes that climatic conditions will not be problematic for food production. This is not a given. In addition, not many individuals champion the idea that more wildlife habitat or tropical rain forest be destroyed to plant crops. And, there is the assumption that a targeted bioterrorism strike on the food system will not occur with the consequences of up-heaving food production. The latter assumption is problematic. For example, The Lugar Survey on Proliferation Threats and Responses estimates the probability of a major biological terrorist attack in the United States in the next 10 years to be about 33%."</p>	<p>Author(s): Terry Etherton</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2009</p> <p>Survey Question(s) Referenced: 10</p>
63	<p>Title: Same as It Ever Was: Nuclear Alarmism, Proliferation, and the Cold War</p> <p>Publication (Publisher): <i>International Security</i> journal article (MIT Press)</p> <p>Link: https://doi.org/10.1162/isec.2010.34.3.7</p> <p>Quote: "In a nonscientific poll of leading security experts conducted by Senator Richard Lugar in 2005, 62 percent of the respondents (49 of 79) said that the chance of a nuclear attack somewhere in the world over the next ten years was between 10 and 50 percent. Only one respondent put the probability at 0 percent. . . .</p> <p>"Should the notion of nuclear alarmism be accepted at face value? In my view, the answer is no: its claims are overstated and, in some cases, wrong, emerging from a poor understanding of the history of nuclear proliferation and nonproliferation."</p>	<p>Author(s): Francis J. Gavin</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2010</p> <p>Survey Question(s) Referenced: 5</p>
64	<p>Title: Securing the Containerized Supply Chain: Analysis of Government Incentives for Private Investment</p> <p>Publication (Publisher): <i>Management Science</i> journal article (Institute for Operations Research and the Management Sciences [INFORMS])</p> <p>Link: https://doi.org/10.1287/mnsc.1090.1105</p> <p>Quote: "We model the ATS score as the product of two factors. First, we let b denote the (exogenously specified) base-rate probability of a terrorist attack in the period of interest. For instance, a recent congressionally mandated report estimates a higher than 50% chance of a WMD attack launched by terrorists, over the next five years. Previous estimates include the work by Lugar (2005)."</p>	<p>Author(s): Nitin Bakshi and Noah Gans</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2010</p> <p>Survey Question(s) Referenced: None</p>
65	<p>Title: Taking Action: President Obama's Nuclear Security Summit</p> <p>Publication (Publisher): News (<i>Daily Kos</i>)</p> <p>Link: https://www.dailykos.com/stories/2010/4/11/856035/-</p> <p>Quote: Opening the article: "The bottom line is this: for the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction. Preventing terrorists from obtaining weapons or materials of mass destruction is a far more exacting arms control goal than existed during the 1970s and 1980s, when a successful agreement might allow for thousands of new nuclear weapons.</p> <p>"I believe that we can develop the international practices and norms that can almost guarantee that terrorists will not have access to nuclear weapons. In doing so, we can transform our world into a place that is more secure and more connected than it has ever been."</p> <p>— Senator Richard Lugar, R-IN, in 'The Lugar Survey On Proliferation Threats and Responses', June 2005"</p> <p>Later in the article: "It has also been known for some time that it has been a goal of terrorist groups to get hold of this type of nuclear material. By now, thanks to the overblown rhetoric of the Bush years, and television shows like '24', a lot of lay people just shrug and assume it's not a concern, but the experts certainly don't. In fact, Senator Lugar's survey of 83 of these experts around the world showed strong agreement that if a nuclear weapon is used, it will be used by terrorists and not a state, and that the material would be acquired on the black market."</p>	<p>Author(s): Page van der Linden</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2010</p> <p>Survey Question(s) Referenced: 6, 7</p>

66	<p>Title: WMD Forecasting in Historical and Contemporary Perspective</p> <p>Publication (Publisher): Paper (Defense Threat Reduction Agency)</p> <p>Link: https://apps.dtic.mil/sti/citations/ADA557001</p> <p>Quote: "The Lugar Survey on Proliferation Threat and Response is one of a kind and does not fit into any of these categories neatly. Rather, it polls national security experts on what they estimate to be the probability of certain kinds of WMD attack in future time spans and publishes tabulations of their responses. . . .</p> <p>"Senator Lugar's Survey on Proliferation Threats and Responses, which polled national security experts, was indicative of their expectations of some form of attack: some 60% of respondents, for example, judged that there was a 10% probability that the world would see a nuclear attack somewhere within 5 years, and a 20% probability of a nuclear attack somewhere within 10 years. About 79% of the respondents also judged that if a nuclear attack occurs within the next 10 years, it would more likely be an attack by a terrorist organization than a state. In the studies overall, however, other scenarios also thought likely to result in WMD use were posited in the military context, e.g., a state uses WMD to attack the U.S. or allies in a regional conflict overseas, where U.S. or allied forces were preparing to intervene or had intervened in the conflict"</p> <p>(Also includes a listing of findings and a description of the survey's purpose, time frame, prevailing context, and methodology; discussion of the report's format, key projections, forecasts, and conclusions; and details on which statistics are used are in the survey questions.)</p>	<p>Author(s): Lewis Dunn, Aaron Arnold, Paul Bernstein, Jennifer Borchard, Jack Boureston, Rebecca Cathell, Jeffrey Cooper, Amanda Grosiak, Jason Wood, Rodney Jones, Jonathan Fox, and James Scouras</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2010</p> <p>Survey Question(s) Referenced: 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20</p>
67	<p>Title: A Pakistani Perspective on WMD Terrorism: Is It Really a Threat?</p> <p>Publication (Publisher): <i>Strategic Studies</i> journal article (Institute of Strategic Studies Islamabad)</p> <p>Link: https://www.jstor.org/stable/48527657</p> <p>Quote: "See also: Richard G. Lugar" in references. No direct reference in article.</p>	<p>Author(s): Muhammad Khurshid Khan</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2011</p> <p>Survey Question(s) Referenced: None</p>
68	<p>Title: Is Better Nuclear Weapon Detection Capability Justified?</p> <p>Publication (Publisher): <i>Journal of Homeland Security and Emergency Management</i> article (De Gruyter)</p> <p>Link: https://doi.org/10.2202/1547-7355.1731</p> <p>Quote: "Securing the United States (U.S.) homeland against a terrorist attack using a nuclear or radiological weapon has been an increasing concern in recent years. Many homeland security experts contend that containers could be a perfect medium to deliver dangerous nuclear or radioactive material. According to a survey of national security and non-proliferation experts compiled in 2005 by U.S. Senator Richard G. Lugar, the median probability estimate of a nuclear attack somewhere in the world is 0.1 and 0.2 in the next 5 and 10 years respectively. For a radiological dispersion device (RDD, or dirty bomb), these figures jump to 0.25 and 0.40.</p> <p>"While these numbers are probably too high due to common biases in probability estimation, they reflect concerns based on evidence. There were 827 confirmed cases of illicit nuclear and radiological materials trafficking worldwide between 1993 and 2005."</p>	<p>Author(s): Niyazi Onur Bakir and Detlof von Winterfeldt</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2011</p> <p>Survey Question(s) Referenced: 4, 5, 13, 14</p>

69	Title: Predicting Peril or the Peril of Prediction? Assessing the Risk of CBRN Terrorism Publication (Publisher): <i>Terrorism and Political Violence</i> journal article (Taylor & Francis) Link: https://doi.org/10.1080/09546553.2011.575487 Quote: "In December 2008, the bipartisan Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism (also known as the Graham-Talent Commission) predicted that 'it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013.' This was only the most recent warning of the peril posed by terrorists armed with chemical, biological, radiological, or nuclear (CBRN) weapons, also called weapons of mass destruction (WMD). Indeed, several other analyses of the likelihood of CBRN terrorism have arrived at remarkably similar conclusions to those of the Graham-Talent Commission. In a 2005 survey of national security experts conducted by Senator Richard Lugar, the risk of a CBRN attack somewhere in the world during the next five years was estimated to be 50 percent. A 2007 survey found that 51% of biologists believed that there would be a bioterrorism incident somewhere in the world within the next five years. The Graham-Talent Commission also concluded that 'terrorists are more likely to be able to obtain and use a biological weapon than a nuclear weapon.' This assessment echoes the result of a 2006 survey conducted by the Center for Strategic and International Studies in which a majority of the experts surveyed ranked the threat of biological terrorism higher than nuclear terrorism. Thus, there appears to be a consensus among experts on the nature of the CBRN terrorist threat. "This consensus, however, is misleading. Since the mid-1990s there has been a lively debate within academic and policy communities about the urgency and severity of the threat of CBRN terrorism. The reports and studies mentioned above reflect only part of the broader debate on this topic. To fully appreciate the risks posed by CBRN terrorism it is necessary to first understand the full spectrum of opinion in the debate and how and why they disagree."	Author(s): Gregory D. Koblentz Perspective on the Lugar Survey: Questioning	Year: 2011 Survey Question(s) Referenced: None
70	Title: Responding to Radiological Attacks: Gaps in Planning and Training for First Responders Publication (Publisher): Presentation (National Radiological Emergency Preparedness Conference) Link: [Original URL no longer valid; presentation can be requested from authors of this literature review] Quote: "The 2005 Lugar Survey on Proliferation Threats and Response showed that half of experts surveyed expected a Dirty Bomb attack within 10 years."	Author(s): Kurt Westerman Perspective on the Lugar Survey: Implicitly positive	Year: 2011 Survey Question(s) Referenced: 14
71	Title: Fifty Years after the Cuban Missile Crisis: Time to Stop Bluffing at Nuclear Poker Publication (Publisher): Briefing paper (Nuclear Age Peace Foundation and Federation of American Scientists) Link: https://www.wagingpeace.org/wp-content/uploads/2013/06/2012_hellman_poker.pdf Quote: "Nuclear terrorism has added a dangerous new dimension. Henry Kissinger has estimated that 'if the existing nuclear countries cannot develop some restraints among themselves . . . then I would expect the use of nuclear weapons [by terrorists] in some 10 year period is very possible.' Republican Senator Richard Lugar conducted a survey of 85 national security experts which reached a similarly alarming conclusion. In addition to possibly losing an American city and causing a financial panic, a nuclear terrorist attack runs the risk of being mistaken for a Russian attack, which then could catalyze a full-scale nuclear war. That risk is increased if the terrorists disguise their attack, either in the hope that Russia and America will destroy one another, or because they have an apocalyptic bent."	Author(s): Martin Hellman Perspective on the Lugar Survey: Implicitly positive	Year: 2012 Survey Question(s) Referenced: 5, 6
72	Title: Handbook of Nuclear Proliferation Publication (Publisher): Handbook (Routledge) Link: https://api.taylorfrancis.com/content/books/mono/download?identifierName=doi&identifierValue=10.4324/9780203840849&type=googlepdf Quote: no quote, only a citation	Author(s): Harsh V. Pant (editor) Perspective on the Lugar Survey: Implicitly positive	Year: 2012 Survey Question(s) Referenced: none

73	<p>Title: No Such Thing as a Free Lunch: A Nuclear-User-Pays Model of International Security</p> <p>Publication (Publisher): <i>The Nonproliferation Review</i> journal article (Taylor & Francis)</p> <p>Link: https://doi.org/10.1080/10736700.2012.690962</p> <p>Quote: "As noted above, the calculation of nuclear risk levels will be highly controversial. Nuclear optimists argue that nuclear deterrence maintains international peace and security, providing benefits to all states. An extrapolation of this argument would suggest that nuclear deterrence policies should result in nuclear-armed states incurring reduced financial responsibilities under a user-pays system for nuclear risk mitigation. In fact, closer examination of relevant factors would suggest the opposite, for several reasons.</p> <p>"First, in the post-9/11 world, there is more contention than ever as to whether nuclear weapons are net producers of security. For example, many former 'Cold Warriors' have renounced nuclear weapons in light of changes in the global risk landscape. The issue of nuclear terrorism is key here; many analysts believe this to be the most likely contemporary source of nuclear weapons use. Some also see it as a potential trigger mechanism for full-scale nuclear war. Second, many analysts argue that the maintenance of nuclear weapons is among the key drivers of nuclear dissemination, while the vast majority of international relations scholars and practitioners agree that dissemination reduces international security. Thus, nuclear deterrence, which features prominently in justifications for maintenance of these weapons, again attracts a high nuclear risk factor."</p>	<p>Author(s): Lyndon Buford</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 6</p>
74	<p>Title: Nuclear Terrorism: Are We Prepared?</p> <p>Publication (Publisher): <i>Homeland Security Affairs</i> journal article (Naval Postgraduate School Center for Homeland Defense and Security)</p> <p>Link: https://www.hsaj.org/resources/uploads/2022/05/8.1.9.pdf</p> <p>Quote: "In April 2010, President Obama said, 'The single biggest threat to US security, both short-term, medium-term and long-term, would be the possibility of a terrorist organization obtaining a nuclear weapon.' This concern over the threat of nuclear terrorism is not new. For decades, policy makers and analysts alike have worried that increased global access to nuclear materials and public knowledge of how nuclear weapons work would certainly lead to a nuclear terrorist incident. In the 1970s, the concern focused on the vulnerability of nuclear power plants; in 1997, it was Russian 'suitcase nukes.' Today, it's the concern that al Qaeda will obtain one of Pakistan's nuclear weapons and move it to the United States. Over the last decade in particular, the rise of transnational terrorism and growth of nuclear technology have increased concerns that the event will happen sooner rather than later (hence the saying, 'it is not a matter of if, but when'). Many believe we are overdue for such an event. For instance, in 2005, nearly two thirds of a group of nonproliferation experts believed that the probability of a nuclear attack somewhere in the world before 2015 was between 10 and 50 percent."</p>	<p>Author(s): Al Mauroni</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 5</p>
75	<p>Title: Optional Reading on Risk Analysis and the Cuban Missile Crisis</p> <p>Publication (Publisher): Course material (Stanford University)</p> <p>Link: https://ee.stanford.edu/~hellman/sts152_03/handout06a.pdf</p> <p>Quote: "When other potential initiating events that could cause us to cross the nuclear threshold (e.g., a nuclear terrorist attack, or a crisis involving Georgia) are included, the risk becomes even larger. Given the statement by Kissinger and Senator Lugar's survey, mentioned earlier in this handout, nuclear terrorism, all by itself, has a much higher probability of causing a nuclear disaster. Considering a sequence of events such as above is important however, since a first use of nuclear weapons in a Russian-American confrontation carries a higher risk of producing a full-scale war than if the first use is by terrorists or India or Pakistan." (Link to other handouts: https://ee.stanford.edu/~hellman/sts152_03/)</p>	<p>Author(s): Martin E. Hellman</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: None</p>
76	<p>Title: Preface: Nuclear Weapons and Critical Thinking</p> <p>Publication (Publisher): Course material (Stanford University)</p> <p>Link: https://ee.stanford.edu/~hellman/sts152_03/handout01.pdf</p> <p>Quote: "Republican Senator Richard Lugar conducted a survey that asked 85 national security experts: 'In your opinion, what is the probability of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years?' The average of their estimates was 30%, and a later question showed that most were thinking in terms of a nuclear terrorist attack. (See pages 14-15 of that document for the relevant data.)"</p>	<p>Author(s): Martin E. Hellman</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 5, 6</p>

77	<p>Title: Power and Willpower in the American Future: Why the United States Is Not Destined to Decline</p> <p>Publication (Publisher): Book (Cambridge University Press)</p> <p>Link: https://www.proquest.com/docview/2132036559/bookReader</p> <p>Quote: "Robert Gallucci, a former senior official and nuclear negotiator in both Democratic and Republican administrations, later Dean of Georgetown School of Foreign Service and President of the MacArthur Foundation, has written: '[U]nless many changes are made, it is more likely than not that al Qaeda or one of its affiliates will detonate a nuclear weapon in a US city within the next five to ten years.' In addition, a survey of one hundred foreign policy experts by <i>Foreign Policy</i> magazine and the Center for American Progress found that more than 80 percent expected a terrorist attack on the scale of 9/11 within a decade. Similarly, there were the responses of eighty-five national security and nonproliferation experts to a survey conducted by the U.S. Senate Foreign Relations Committee staff for its then-chairman, Senator Richard Lugar of Indiana. They were asked to predict the likelihood of a CBRN attack occurring anywhere in the world within the following ten years. Their average probability estimate was 29 percent for a nuclear attack, 40 percent for a radiological attack, and 70 percent for some kind of CBRN event."</p>	<p>Author(s): Robert J. Lieber</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 5, 14</p>
78	<p>Title: Progress of "Biodefense Strategy for the 21st Century"</p> <p>Publication (Publisher): Case Studies Working Group Report (US Army War College)</p> <p>Link: https://www.jstor.org/stable/pdf/resrep11953.8.pdf?refreqid=excelsior%3A859748f90b81e02194906317d7f9a7ca&ab_segments=&origin=&acceptTC=1</p> <p>Quote: "International cooperation is key to reducing biological threats, but technology and concepts in support of global interdiction efforts may be limited for the near future. Easy access to technical information and equipment around the globe is one of the leading reasons why many analysts believe that there is an increased chance of CBRN terrorism in the near future. [Lugar survey cited]"</p>	<p>Author(s): Al Mauroni</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: None</p>
79	<p>Title: Security in 21st Century Europe</p> <p>Publication (Publisher): Book (Palgrave Macmillan)</p> <p>Link: https://www.bloomsbury.com/us/security-in-21st-century-europe-9781137006462/</p> <p>Quote: "The 9/11 terrorist attacks generated significant debate about the prospect of terrorist groups obtaining and using WMD. As is discussed in Chapter 8, after 9/11 Europe became one of the main 'fields of <i>jihād</i>' for Islamic terrorists, suggesting that, were terrorists to obtain WMD, Europe might be one of their most likely targets. The likelihood and extent of the threat posed by WMD terrorism is, however, controversial. Some, especially in the USA, argue that WMD terrorism, in particular nuclear or biological terrorism, is a very real possibility and would give terrorists the potential to kill, or threaten to kill, millions of people. Senator Richard Lugar, former chair of the US Senate Foreign Relations Committee, has argued that 'for the foreseeable future, the United States and other nations will face an existential threat from the intersection of terrorism and weapons of mass destruction.' Others argue that there are very serious technical obstacles to true mass casualty terrorism, and that the most likely forms of WMD terrorism are small-scale chemical, biological or radiological attacks such as the 1995 Aum Shinrikyo nerve gas attack on the Tokyo underground and the distribution of anthrax spores in the USA after 9/11."</p>	<p>Author(s): Andrew Cottey</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: None</p>
80	<p>Title: Supporting Nuclear Non-proliferation and Disarmament</p> <p>Publication (Publisher): Handbook for Parliamentarians (Inter-Parliamentary Union)</p> <p>Link: https://www.pnnd.org/ipupnnd-handbook-supporting-nuclear-non-proliferation-and-disarmament</p> <p>Quote: "Former US Secretary of Defence William Perry has estimated the chance of a nuclear terrorist incident within the next decade at roughly 50 per cent.³³ US Senator Richard Lugar, in a survey of 85 national security experts, found that a median of 20 per cent agreed on the "probability of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years". Even if such predictions are thought to err on the side of optimism, risk analyses projecting extremely low probabilities should spur policymakers to action, given the devastating effects of an intentional or accidental nuclear explosion.</p> <p>"The probability of the combination of events leading to the Fukushima disaster occurring was considered so low as not to warrant attention and contingency planning – in hindsight much to our detriment. The probability of a nuclear weapons catastrophe occurring is not only higher than the Fukushima disaster, but its consequences would dwarf that event. We do not have the option of waiting until after a nuclear weapons catastrophe to learn from our mistakes and take action for future disasters. The risks are simply too great."</p>	<p>Author(s): Inter-parliamentary Union</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 5</p>

81	<p>Title: The Future of US Global Power: Delusions of Decline</p> <p>Publication (Publisher): Book (Palgrave Macmillan)</p> <p>Link: https://books.google.com/books?hl=en&lr=&id=Bxm7D1_-p6UC&oi=fnd&pg=PP1&ots=EzFWjpbCJ0&sig=um3SvlwACG8JNwUTJzzOToURAs8</p> <p>Quote: "President Obama laid out his longer-term vision for a nuclear free world, stating that 'Nuclear terrorism is one of the most urgent and serious threats to global security' and 'this is one of those challenges in our interconnected world that can only be meet when we work as an international community.' Seven years earlier, Senator Richard Lugar had conducted a survey assessing the chances of a nuclear attack somewhere in the world within the next ten years. Some 60 per cent of experts placed the risk between 10 and 50 per cent. Indeed, 'it's hard to find an analyst or commentator on nuclear proliferation who is not pessimistic about the future.'"</p>	<p>Author(s): Stuart S. Brown</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 5</p>
82	<p>Title: Pakistan and the "Four Faces" of Nuclear Terrorism: A Preliminary Assessment</p> <p>Publication (Publisher): Chapter in <i>Pakistan's Stability Paradox: Domestic, Regional and International Dimensions</i> book (Routledge International)</p> <p>Link: https://www.routledge.com/Pakistans-Stability-Paradox-Domestic-Regional-and-International-Dimensions/Misra-Clarke/p/book/9780415728256</p> <p>Quote: "Since 9/11 this tendency has been heightened to such a degree that much of the analysis asserts that the acquisition and use of nuclear material by a terrorist group is a case of 'not if, but when'. The prevalence of this argument is reflected in a survey of 83 security and nuclear specialists conducted by US Senator Richard G. Lugar, in which 79 per cent of the respondents said that if a nuclear attack was to occur in the next decade it would be more likely to be carried out by a terrorist group than by a state. However, such analysis conflates motive and capability leading to a number of assumptions: first, that because certain terrorist groups wish to acquire nuclear materials (or other WMD), they will ultimately be successful in doing so; and second, that once they acquire such materials they will be able to construct a deliverable weapon. Analysis based on such assumptions ultimately fails to consider the technical obstacles to terrorists acquiring nuclear materials."</p>	<p>Author(s): Michael E. Clarke</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2012</p> <p>Survey Question(s) Referenced: 6</p>
83	<p>Title: Comparing Homeland Security Risks Using a Deliberative Risk Ranking Methodology</p> <p>Publication (Publisher): Dissertation (Pardee RAND Graduate School)</p> <p>Link: https://www.proquest.com/docview/1462549114?pq-origsite=gscholar&fromopenview=true</p> <p>Quote: "The estimates for the likelihood of an anthrax attack are wide ranging. In early 2005, Senator Lugar solicited expert opinion of the likelihood of a biological attack somewhere in the world in the next ten years, and answers ranged from near zero to near certainty. Another set of estimates came from a Sandia model. For one estimate, the Sandia model presented an estimate of likelihood for an anthrax attack. Additionally, the Sandia model suggested that an anthrax attack was seven times as likely as a nuclear attack; as there are more estimates of the likelihood of an nuclear attack, we can apply this multiplier can be applied to the range of estimates of the likelihood of a nuclear attack to calculate estimates of likelihood of an anthrax attack. These estimates give a range for the likelihood of an anthrax attack in a given year as between 0.07% and 25%. This estimate of 25% is assuredly too high—at the time the estimate was made in 2011 ten years had passed since the previous event without any anthrax attacks occurring—but it can serve as an upper bound." (Lugar survey results are also used in a table on the estimates of terrorist nuclear detonation.) "Experts are split on how likely it is that terrorists will actively seek a nuclear weapon, can obtain or create a nuclear weapon if they seek it, and use it if they possess one. Some experts present the likelihood of a nuclear event as a certainty ("when, not if"), while others are skeptical. In early 2005, Sen. Lugar solicited expert opinion of the likelihood of a nuclear attack somewhere in the world in the next ten years, and answers ranged from 0% to 100%. These provide a wide range for our estimates for the likelihood of a nuclear terrorist attack in a given year, with a low of 1 in 10,000 and a high of 26%. Our best estimate for the likelihood of a nuclear attack in a single year is 0.1%, reflecting some expert opinion and event tree modeling. We emphasize that this best estimate or any best estimate is highly speculative. . . ."</p>	<p>Author(s): Russell Lundberg</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 10</p>

84	<p>Title: Deep Currents and Rising Tides: The Indian Ocean and International Security</p> <p>Publication (Publisher): Book (Georgetown University Press)</p> <p>Link: https://www.proquest.com/docview/2135415623/bookReader</p> <p>Quote: "Many international officials and analysts argue that some form of CBRN attack is highly likely in the next decade. The nightmare scenario, in which terrorists would move from a position of relative technological weakness to approximate symmetry of power with their enemies in the United States and elsewhere, is certainly no longer unthinkable. A survey was commissioned in late 2004 and early 2005 by the US Senate Foreign Relations chairman Richard Lugar to canvas the views of more than eighty international arms control and national security experts. They put the likelihood of a CBRN attack occurring in the next ten years at 70 percent. There was strong, though not unanimous, agreement that any nuclear attack is more likely to be carried out by a terrorist organization than a government. A majority of those surveyed said a black market purchase was the most likely way for terrorists to get nuclear weapons or fissile material."</p>	<p>Author(s): John Garofano and Andrea J. Dew (editors)</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 6, 7</p>
85	<p>Title: Nuclear Terrorism: The New Terror of the 21st Century</p> <p>Publication (Publisher): IDSA Monograph Series (Institute for Defence Studies and Analysis)</p> <p>Link: https://idsa.in/system/files/Monograph27.pdf</p> <p>Quote: "Till date, there is no established record to suggest that terrorists have been successfully able to acquire an intact nuclear weapon or construct a crude nuclear device. What is the likelihood of terrorists acquiring nuclear capability? Matthew Bunn created a probability model in the Annals of the American Academy of Political and Social Science that estimates the probability of a nuclear terrorist attack over a 10-year period to be 29 per cent-identical to the average estimate from a poll of security experts commissioned by Senator Richard Lugar in 2005.²⁰ Several factors might play a dominant role in this probable outcome. Global Fissile Material Report 2011 provides updated estimates of the current global inventory of HEU to be about 1440 ± 125 tons,²¹ most of it belongs to Russia and the US. The large uncertainty is due to a lack of accurate public information about Russian HEU production and consumption. . . .</p> <p>"On the brighter side, despite the continuing risk of nuclear weapons falling into the hands of terrorists groups and a consequent act of nuclear terrorism, the situation has not spiralled out of control yet. The Lugar Survey on Proliferation Threats and Responses conducted in 2005 pitched the median estimate of the risk of a nuclear attack (by terrorists) during the next five years as 10 per cent while the average estimate was 16.4 per cent. When the period was extended to 10 years, the median response doubled to 20 per cent and the average response almost doubled to 29.2 per cent. In 2007, physicist Richard Garwin put the likelihood of a nuclear explosion on an American or European city by terrorist or other means at 20 per cent per year, which could work out to 87 per cent over a 10-year period. So far, these prognoses still remain probabilities. . . .</p> <p>"Seemingly, Al Qaida would prefer the latter option since it is less complicated to obtain fissile material than to get a whole nuclear bomb. In a survey conducted by Senator Richard G. Lugar, 63 of the 83 respondents selected 'black market purchase' as the most likely means from where terrorists might obtain fissile material. 55 per cent of those responding⁵⁰ saw terrorist manufacture of a nuclear weapon after obtaining material as more likely, while 45 per cent believed that terrorist acquisition of a working nuclear weapon was the more probable scenario. In a survey conducted by the author, the opinion is equally divided. The respondents believed that the possibility of terrorists' access to nuclear weapons is possible vide the nuclear black market as well as through acquisition."</p>	<p>Author(s): Reshmi Kazi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 5, 4, 6</p>
86	<p>Title: Resource Guide on Nuclear Disarmament for Religious Leaders and Communities</p> <p>Publication (Publisher): Resource guide (Religions for Peace)</p> <p>Link: https://www.baselpeaceoffice.org/sites/default/files/imce/articles/News/rfp_resource-guide-nuclear-disarmament_v08_preview-pages.pdf</p> <p>Quote: "As long as nuclear weapons remain deployed, the world faces a very real threat of nuclear use by accident, miscalculation or intent. Former U.S. Senator Richard Lugar, in a 2005 survey of 85 U.S. national security experts, found that 20 percent agreed on the 'probability of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years.'"</p>	<p>Author(s): Religions for Peace</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 5</p>

87	<p>Title: Should Cities Invest in Sheltering-in-Place Measures against Chlorine Truck Attacks by Terrorists?</p> <p>Publication (Publisher): <i>Risk Analysis</i> journal article (Wiley)</p> <p>Link: https://doi.org/10.1111/j.1539-6924.2012.01925.x</p> <p>Quote: A table lists parameters used for analysis of the annual probability of attack in an area covered by detector and alert systems. In the Sources column, parameters are noted to be “similar to range of estimates in Lugar.”</p>	<p>Author(s): Anthony Michael Barrett and Elizabeth A. Casman</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 11, 12</p>
88	<p>Title: The Nuclear Terrorism Disconnect: Electoral Incentives and U.S. Policy Responses</p> <p>Publication (Publisher): Thesis (University of British Columbia)</p> <p>Link: https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/24/items/1.0071964</p> <p>Quote: “In December of last year, Obama spoke to the Nunn-Lugar Cooperative Threat Reduction Symposium, and declared, ‘I continue to believe that nuclear terrorism remains one of the greatest threats to global security.’</p> <p>“In addition to the President, there are a number of nuclear policy experts that also share this view. “The Lugar Survey on Proliferation Threats and Responses,” conducted by former Senator Richard Lugar (R-IN) in 2005, was sent to 132 “non-proliferation and national security experts.” Sen. Lugar received 85 responses. For the purposes of this paper, one of the most one of the most relevant questions in the survey was, ‘[i]n your opinion, what is the probability (expressed as a percentage) of an attack involving a nuclear explosion occurring somewhere in the world in the next five years?’ This question was then repeated, with a time frame of ten years. Lugar’s analysis of the responses is here reproduced:</p> <p>‘When the time frame for a nuclear attack was extended to ten years, the respondents were much more pessimistic. The median answer doubled from 10% to 20%, while the average response nearly doubled to 29.2%. Only one of the 76 respondents thought the risk of a nuclear attack was zero. At the other end of the spectrum, four respondents judged the risk to be 100%. Overall, 62% of respondents (49 of 79) estimated the risk of a nuclear attack over the next ten years to be between 10% and 50%.’</p> <p>“Of course, these questions are not specific to nuclear terrorism, so an additional, clarifying question was posed: ‘In your opinion, if a nuclear attack occurs during the next 10 years, is it more likely to be carried out by terrorists or by a government?’ Only 21 percent of respondents believed that a nuclear-armed government would use their ultimate weapons in an attack, while the other 79 percent viewed terrorists as the likely culprits. There is a disconnect between this threat assessment and the actual demographics of the “nuclear club.” At the time of the survey, eight nations possessed nuclear weapons, North Korea was a year away from testing its first, and Iran had been viewed as a nuclear aspirant for years. Meanwhile, only three terrorist organizations had ever expressed even a passing desire for nuclear arms: “the Aum Shinrikyo cult in Japan, Chechen rebels in Russia, and al Qaeda.” In the post 9/11 context, it seems likely that the ‘Lugar Survey’ respondents were most immediately concerned with al Qaeda’s nuclear intentions.”</p>	<p>Author(s): Samuel Thomas Reed</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 4, 5, 6</p>
89	<p>Title: The Problem of Political Authority</p> <p>Publication (Publisher): Chapter in <i>The Problem of Political Authority</i> book (Palgrave Macmillan)</p> <p>Link: https://link.springer.com/chapter/10.1057/9781137281661_1</p> <p>Quote: “In 2005, U.S. Senator Richard Lugar surveyed 85 nonproliferation and national security experts from around the world on their assessments of the risk of terrorism involving weapons of mass destruction (WMD). On average, respondents considered a terrorist nuclear attack somewhere in the world within the following ten years to be 29 percent likely and a major biological attack 33 percent likely. In 2008, the U.S. government’s Commission on the Prevention of WMD Proliferation and Terrorism deemed it more likely than not that a WMD terrorist attack would occur somewhere in the world by the year 2013, with a biological attack being more likely than a nuclear attack.</p> <p>“These assessments should be taken with a grain of salt, as national security experts may have a bias toward overstating threats to national security. Those who are most predisposed toward concern about national security threats are most likely to become national security experts. Many of these experts work for governments, which tend to profit from public perception of serious national security threats. Most importantly, these assessments are subjective guesses, assessments of the sort that is least reliable and most easily influenced by bias. This unreliability is perhaps reflected in the fact that expert assessments of the probability of WMD terrorism cover the whole range from 0 to 100 percent. Experts who provide detailed consideration of the various ways in which a terrorist plot might fail tend to see the risks as much smaller than indicated in the previous paragraph.”</p>	<p>Author(s): Michael Huemer</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2013</p> <p>Survey Question(s) Referenced: 5, 10</p>

90	Title: Cities in a Time of Terror: Space, Territory, and Local Resilience Publication (Publisher): Book (Routledge International) Link: https://www.taylorfrancis.com/books/mono/10.4324/9781315705675/cities-time-terror-space-territory-local-resilience-savitch Quote: Citation only, no quote	Author(s): H. V. Savitch Perspective on the Lugar Survey: Implicitly positive	Year: 2014 Survey Question(s) Referenced: None
91	Title: Section III. Minimum Deterrence: U.S. Nuclear Weapons and the Priority Threat Facing the United States Publication (Publisher): Report (National Institute for Public Policy) Link: https://www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Litigation_Release/Litigation%20Release%20-%20Section%20III%20Minimum%20Deterrence%20US%20Nuclear%20Weapons%20and%20Priority%20Threats.pdf Quote: "Some analysts have recently attempted to quantify the probability (intent x capability) of a successful nuclear terrorist attack against the United States. For example, Richard Garwin estimated there is a 20 percent probability per year of a successful terrorist nuclear (not radiological) attack. Senator Richard J. Lugar commissioned a survey in 2005 to study what experts thought were the greatest WMD and proliferation threats facing the United States. According to the results of the survey, the experts believed on average that there was a 16.4% chance of a nuclear (again, not radiological) terrorist attack on the United States in the next five years, and a 29.2% chance in the next 10 years. Harvard professor Matthew Bunn, in his article 'A Mathematical Model of the Risk of Nuclear Terrorism, writes that there is approximately a three percent yearly chance of a successful terrorist nuclear attack and a 29.2% chance over a ten year period. While both studies coincidentally came to the same numerical probability, Bunn's study used mathematical modeling while the Lugar survey averaged the probabilities included in the multiple responses to the survey. Graham Allison, Director of the Belfer Center at Harvard, estimated in 2004 that there was a 'greater than 50 percent' chance of a successful nuclear terrorist attack in the 'next decade.' "While these experts to some extent recognize the limits of their predictions, the inherent problem with quantifying the probability of such complex human actions with this type of precision is that the knowledge required to make these claims credibly spans the areas of psychology, sociology, history, physics, chance, and unknown/unknowable factors that can affect the system under study. Indeed, the National Research Council, when asked to assess the probability of a radiological terror attack, wrote that, 'In the context of terrorism and other malevolent misuses, it may still be possible to evaluate the consequences (in terms of the number of fatalities, economic losses, and social effects) for specific scenarios with relative rigor. Evaluation of probabilities, however, lies beyond the reach of traditional analytic techniques because the probability of a successful terrorist attack involves many factors that cannot be objectively quantified.'"	Author(s): National Institute for Public Policy Perspective on the Lugar Survey: Negative	Year: 2014 Survey Question(s) Referenced: 4, 5
92	Title: Nuclear Security in the 21st Century: The Role of UNSCR 1540 and Its Shortcomings Publication (Publisher): Chapter in <i>Still the Century of Overkill?</i> book (Nomos) Link: https://books.google.com/books?hl=en&lr=&id=WE0SDQAAQBAJ&oi=fnd&pg=PA67&ots=jSdigMHnDQ&sig=ZIE4hrvrzqrS32EhLxCNGUAGco Quote: "The radiological threat is significant because of the high probability of illicit acquisition of these materials, due to their availability in a multitude of applications in several un-safeguarded locations worldwide. Thus while scenarios a) and b) are low-probability and high-consequence events, scenarios c) and d) are seen as high-probability and low-consequence events. Despite the low-consequence factor, the relative ease of acquiring such materials means that the security of radiological materials should not be underestimated and deserves to be carefully considered."	Author(s): Enrico Fiorentini Perspective on the Lugar Survey: Implicitly positive	Year: 2014 Survey Question(s) Referenced: None
93	Title: Nuclear Terrorism and Maritime Security Publication (Publisher): Chapter in <i>Global Maritime Security: New Horizons</i> book (Turkish Naval Forces) Link: http://prognoz.eurasian-defence.ru/sites/default/files/source/newhorizons.pdf#page=231 Quote: "Terrorist attacks with the use of RDD are seen among the gravest maritime terrorism scenarios, which would have devastating impact on world economy since it could cripple global trade. The likelihood of a dirty bomb attack has been seen relatively likely than a nuclear attack (Lugar 2005, p. 6). "Obtaining a dirty bomb is not easy and poses challenges. The most likely scenario is the potential smuggling and detonation of a nuclear device or dirty bomb in a shipping container at a port."	Author(s): Şebnem Udum Perspective on the Lugar Survey: Implicitly positive	Year: 2014 Survey Question(s) Referenced: 14, 5, 4, 13

94	<p>Title: Nuclear Terrorism and Pakistan: Reassessing the State's Behaviour</p> <p>Publication (Publisher): <i>Pakistan Horizon</i> journal article (Pakistan Institute of International Affairs)</p> <p>Link: https://www.jstor.org/stable/pdf/44988734.pdf?refreqid=excelsior%3A875ee2a2f338d5282cb90c401596975a&ab_segments=0%2F5YC-6646_phrase_search%2F1tr&origin=</p> <p>Quote: "Subsequently, the nuclear terrorism phenomenon was associated with NSAs and 'rogue' states. For example, after the 9/11 terrorists attacks on the US, many observers predicted the high prospects of a nuclear weapons-related threat of terrorism, assuming that the terrorists might acquire and use such weapons to achieve their political-cum-religious motives. The devastating events of 9/11 in 2001 triggered an insightful debate about the safety and security aspects of nuclear weapons and related material. The western community considered the nuclear threat imminent and serious. [Lugar survey cited] Extensive literature was produced to assess these threats and the capabilities of terrorists in scholarly discourse."</p>	<p>Author(s): Zulfqar Khan and Rizwana Abbasi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2015</p> <p>Survey Question(s) Referenced: 7, 8</p>
95	<p>Title: Calculations in Disaster: Quantifying Unfortunate Events for Strategic Planning and Resource Allocation</p> <p>Publication (Publisher): Presentation (California Department of Public Health)</p> <p>Link: http://slideplayer.com/slide/7408810/</p> <p>Quote: On the slide titled "Risk of Nuclear Attack during the Next 10 Years: "Question 5: In your opinion, what is the probability (expressed as a percentage) of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years?"</p> <ul style="list-style-type: none"> • 79 experts in nuclear proliferation and terrorism gave their best estimation. • The average response was 19.2%. <p>"Annually, that's a risk of . . . 3.4% per Year."</p>	<p>Author(s): Victor Anderson and James M. Thomas</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2015</p> <p>Survey Question(s) Referenced: 5</p>
96	<p>Title: The Bomb, Escalation, and the Humanitarian Pledge 2015</p> <p>Publication (Publisher): Blog post (<i>Arms Control Wonk</i>)</p> <p>Link: https://www.armscontrolwonk.com/archive/404788/the-bomb-escalation-and-the-humanitarian-pledge/</p> <p>Quote: "83 experts were surveyed for their opinions on likelihood of significant WMD terrorist attack over a 10 year period (maybe 2005-2014). The average opinion was 29% for nuclear attack, 33% for biological attack, 30% for chemical attack, and 40% for a radiological attack. There was a wide range of opinion, with some experts giving higher odds, and some lower odds. In the event, none of these events transpired during the 10-year period. If experts were re-surveyed today, they would likely assess lower odds.</p> <p>"I did try to analyze this data and asked the Lugar Center for a copy of the original data (minus the names), but was rebuffed. The Lugar report suggested combined odds of any WMD attack of as much as 70%, but this lacks evidentiary support as no survey question addressed the combined odds. My best guess is that some experts saw high odds for WMD use of all types, while other experts saw lower odds for all types. These odds would likely be highly correlated with the unasked question, how likely is it that al Qaeda will become the biggest, baddest terror group in all history?</p> <p>"The average of expert opinion was not "proved wrong" because the flip side is 71% chance of no nuclear attack, 67% chance of no biological attack, 70% chance of no chemical attack, and 60% chance of no radiological attack. Nevertheless, the evidence of history is that "conventional" terrorism is far more likely than WMD terrorism, WMD terror attacks are rare, and chemical weapons are the most likely type of WMD attack. None of this means the odds of other WMD attacks are zero, but realistic numbers are probably lower than what the experts assessed in 2004/2005."</p> <ul style="list-style-type: none"> • The following comment, posted by Krepon on October 16, 2015, at 9:17 pm appears on the post: "Jonah, I'm no statistician, but these percentages leave me cold. I remember when Senator Lugar was on the SFRC, he used to send out questionnaires to us experts on the probabilities of something really bad happening. Our prognostications were always pessimistic. Ten years later, they were badly wrong. MK" 	<p>Author(s): Michael Krepon</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2015</p> <p>Survey Question(s) Referenced: 5, 10, 12, 14</p>

97	<p>Title: The Climate-Nuclear Nexus: Exploring the Linkages between Climate Change and Nuclear Threats</p> <p>Publication (Publisher): Report (World Future Council)</p> <p>Link: https://pure.mpg.de/rest/items/item_2483708/component/file_2483709/content</p> <p>Quote: "More than a thousand tons of nuclear weapon-usable materials remain as well, and with the projected increase of nuclear energy the precursors for nuclear weapons development are thus proliferating. The possibility that nuclear weapons or sensitive nuclear materials could fall into the hands of terrorists cannot be ruled out. Indeed, intelligence assessments deem such a scenario worryingly plausible, due mostly to weak borders and ill-secured nuclear facilities and depots." [Note includes "See also Lugar, R., 'The Lugar Survey of Proliferation Threats and Responses,' Office of Senator Lugar, Washington D.C., June 2005.]</p>	<p>Author(s): Jurgen Scheffran, John Burroughs, Anna Leidreiter, Rob van Riet, and Alyn Ware</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2015</p> <p>Survey Question(s) Referenced: None</p>
98	<p>Title: Credibility of the Threat from a Radiological Dispersal Device by Terrorists within the United States</p> <p>Publication (Publisher): Thesis (US Army Command and General Staff College)</p> <p>Link: https://apps.dtic.mil/sti/pdfs/AD1040037.pdf</p> <p>Quote: "Currently, there is an inconsistency among experts about whether or not individuals, autonomous cells, or hierarchical terrorist organizations would actively pursue and employ an RDD. Most opinions range from surprise that an attack has not yet occurred to a doubt about their employment while generally acknowledging the presence of a threat. In an attempt to quantify the perceived probability in 2005, Senator Lugar, Chairman of the Senate Foreign Relations Committee, published the results of a survey that questioned 80 professionals within government and industry related to security and nonproliferation. They asked the likelihood of an RDD attack in the next five years or the next ten years. The committee averaged the subjective responses from the various countries to produce an average risk. The Senate Foreign Relations Committee identified the risk of an RDD attack in the next five years and 10 years to be 27 percent and 40 percent, respectively. Conversely, that also means there was a prevailing opinion that it was more likely that terrorists would not employ an RDD. Despite the public attention RDDs were receiving at the time, the majority of survey participants were right. The other important thing to note is that they indicated the probability of an attack would increase over time."</p>	<p>Author(s): Elizabeth A. Schwemmer</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2016</p> <p>Survey Question(s) Referenced: 13, 14</p>
99	<p>Title: Nuclear Terrorism: The Sum of All Fears</p> <p>Publication (Publisher): Chapter in "The Nuclear Terrorism Threat: How Real Is It?" working paper (Nonproliferation Policy Education Center)</p> <p>Link: https://npolicy.org/article_file/1602-The_Nuclear_Terrorism_Threat.pdf</p> <p>Quote: "But it is not clear that time works for us in the world of non-state actors who could conduct terrorism using nuclear or other WMD weaponry. For over ten years in various presentations, I have been citing surveys of nonproliferation experts on the likelihood that a weapon of mass destruction would be used. One of those surveys was conducted in 2005 by Senator Richard Lugar, the former Chairman of the Senate Foreign Relations Committee. According to his survey of leading nonproliferation and national security experts, the risks of a WMD attack against a city or other target were judged to be substantial. The average response of the risk of a nuclear, chemical, or biological attack over ten years was about 30 percent. The average response to the risk of employment of a radiological device was about 40 percent.</p> <p>"Should we be comforted or not that such attacks have not happened as the survey was done more than ten years ago? One can argue that counterproliferation and counterterrorism actions and programs are working. A more pessimistic assessment would be that we are living on borrowed time. No domestic WMD attack has happened in the last decade, and no WMD attacks have occurred overseas except for chemical weapons use in Syria. But maybe the survey's assessments were correct and greater WMD use is just right around the corner."</p>	<p>Author(s): John Lauder</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2016</p> <p>Survey Question(s) Referenced: 10, 12, 14</p>

100	<p>Title: The Climate and Security Imperative</p> <p>Publication (Publisher): Chapter in <i>Handbook of Transitions to Energy and Climate Security</i> book (Routledge International)</p> <p>Link: https://www.taylorfrancis.com/chapters/edit/10.4324/9781315723617-3/climate-security-imperative-francesco-femia-caitlin-werrell</p> <p>Quote: "Climate change is similar to other so-called 'new security risks' or 'transnational security risks,' in that it is widely recognized as a high probability, high consequence risk. This effectively means climate change is happening, and has potentially very significant, negative implications for international security. Despite this general consensus, the response to climate change from most governments, to date, has not yet been commensurate to the risk. The detonation of a weapon of mass destruction, for example, has been considered as a low probability, yet high consequence risk by experts. This suggests that though the probability of such a weapon being detonated by a state or a non-state actor is low, such an event would be unacceptably catastrophic. Further, low probability events happen all the time. Given the legitimate 'low tolerance' for such an eventuality, a regime of international laws, and significant state resources, have been marshaled and deployed to track and prevent the proliferation of weapons of mass destruction."</p>	<p>Author(s): Francesco Femia and Caitlin Werrell</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2016</p> <p>Survey Question(s) Referenced: None</p>
101	<p>Title: The End of Nuclear Proliferation?</p> <p>Publication (Publisher): <i>The Buzz</i> blog post (<i>National Interest</i>)</p> <p>Link: https://nationalinterest.org/blog/the-buzz/the-end-nuclear-proliferation-17104</p> <p>Quote: "The unique ability of nuclear weapons to resolve the underlying causes of insecurity has led academics and practitioners to consistently predict an impending tidal wave of proliferation; President Kennedy predicted in 1963 that there would be 10 to 20 new nuclear states by 1975, when in actuality only two unofficial nuclear powers emerged (Israel and India). Similarly, a 2004-2005 survey of proliferation threats conducted by the office of then Senator Richard Lugar (R-IN), predicted that as many as seven new nuclear states would emerge by the year 2016, but there have been none.</p> <p>"Rather than the seven new nuclear states predicted by the experts polled in the Lugar survey, it is difficult to identify any state that, either now or in the foreseeable future, is likely to acquire or even pursue nuclear weapons. These experts might be forgiven for failing to anticipate the successful negotiation of the Joint Comprehensive Plan of Action with Iran, but even assuming that Iran had gone on to acquire nuclear weapons, it is difficult to identify other dominos that would have fallen in the time frame under consideration.</p> <p>"The reality, rather, is that there have been remarkably few cases of proliferation and their frequency has been in steady decline for the better part of three decades, standing in stark contrast to what both academics and policy-makers routinely predicted."</p>	<p>Author(s): Todd C. Robinson</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2016</p> <p>Survey Question(s) Referenced: 2</p>
102	<p>Title: Validation in the Absence of Observed Events</p> <p>Publication (Publisher): <i>Risk Analysis</i> journal article (Wiley)</p> <p>Link: https://doi.org/10.1111/risa.12442</p> <p>Quote: "Typically, WMD TRAMs in fact do seek to model the RGP. As mentioned, one of us is co-PI of a recently completed study that compares four Nuclear TRAMs and a survey. The four TRAMs modeled the RGP as a probabilistic causal chain. The survey (Lugar12) simply surveyed 83 expert survey respondents, asking them overall-risk questions (e.g., 'In your opinion, what is the probability . . . of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years?') and aggregating their answers. We can suppose the same RGP modeling was going on with the Lugar survey, but that modeling was conducted entirely inside the respondents' heads.</p> <p>"But were the RGPs used by those TRAMs validated against any accessible information on the real-world RGP? Not in any way that could be described as an externally observable 'validation test.' Based on our reviews and participation, we are confident that the modelers in all four of those explicit-RGP TRAMs carefully built their models of the RGP to be their best representation of the real-world RGPs, but in fact the process was one of best modeling judgment or a combination of best modeling judgement and subject matter expert (SME) elicitation. In no case was the model's RGP systematically and transparently (i.e., observable to a third party) tested against some external/independent reference estimate of the real-world RGP. This article is not intended as a critique of those models (in fact each model is quite impressive, each in different ways), but we make these critical statements to clarify what is called for, and not currently performed, in the way of validating WMD TRAMs. . . .</p> <p>"Also, these four tests may strike the reader as labor intensive. . . . Take as one example an analysis by Bunn that posits the expected loss (probability times consequence) of an IND attack to be on the order of \$100 billion per year. The probability he uses in that estimate, 29% over a decade, is the same probability as the average response to a similar question put to 79 expert respondents in a survey by Lugar. Certainly, the estimation of IND risk is quite problematic, but the studies by Bunn and Lugar, taken together, suggest the risk is quite large."</p>	<p>Author(s): John Lathrop and Barry Ezell</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2016</p> <p>Survey Question(s) Referenced: 5</p>

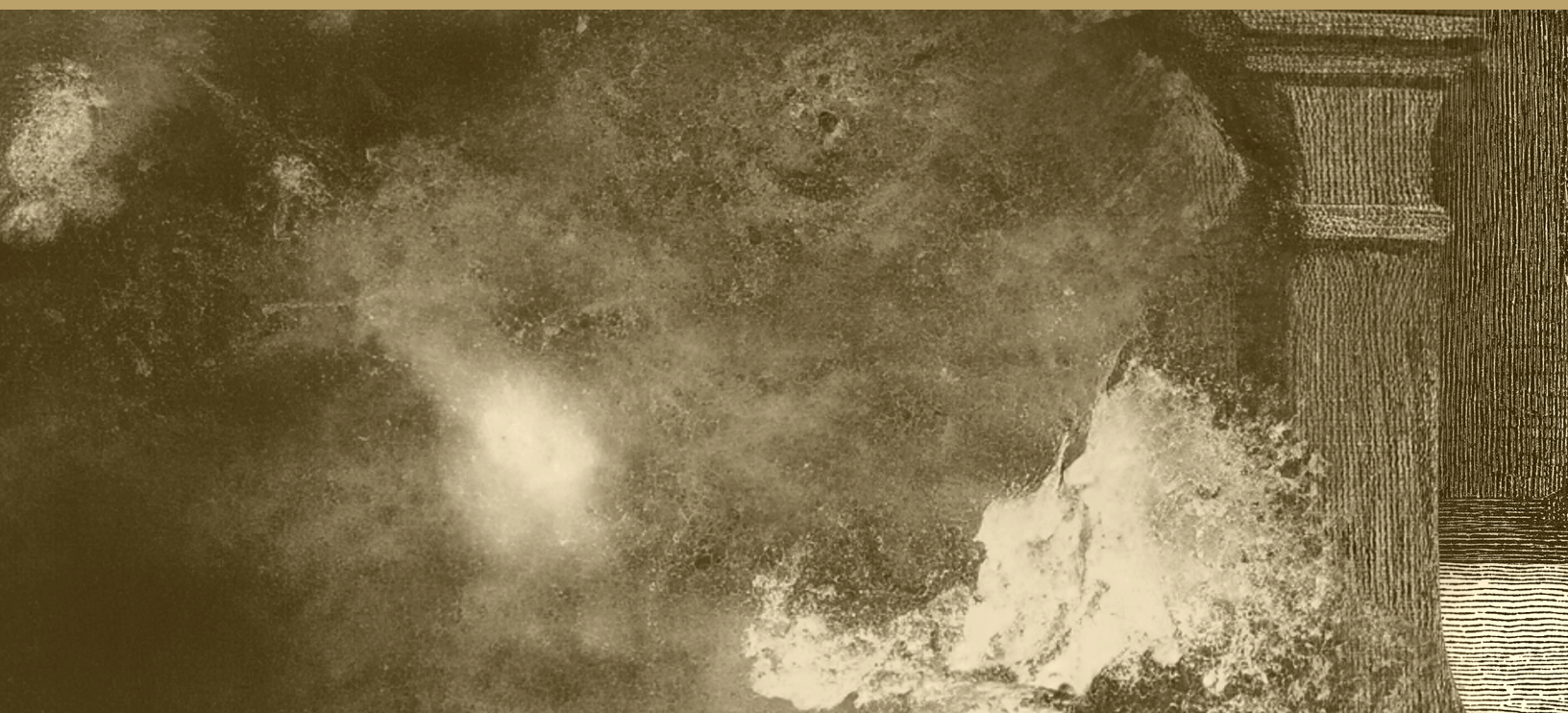
103	<p>Title: Nuclear Terrorism and Virtual Risk: Implications for Prediction and the Utility of Models</p> <p>Publication (Publisher): <i>European Journal of International Security</i> article (Cambridge University Press)</p> <p>Link: https://doi.org/10.1017/eis.2017.5</p> <p>Quote: "Modelling can catalyse stakeholder community engagement with a topic of investigation in a shared manner, with models 'focusing debate and highlighting the basis for disagreements'. In the domain of nuclear terrorism, assessments have typically been carried out by individual analysts, while group efforts to determine likelihoods have focused on simplistic elicitation of overall probabilities. . . .</p> <p>"In the application of event trees, the characteristics of terrorist groups that would pursue nuclear terrorism are considered to be generic. This is an unrealistic simplification highlighted by Michael Levi who makes clear that '[r]ather than assuming a single model of skill and capability building, an intelligent defensive strategy will prepare to take advantage of a wide range of terrorist approaches.' This statement is reinforced by a cursory examination of two high-profile groups that have in the past considered the possibility of nuclear terrorism, Aum Shinrikyo (now defunct) and Al-Qaeda. The former, a doomsday cult, was based largely in a first world country with attendant security and intelligence services; the latter operates transnationally, in some cases in fragmented states without effective security forces, at other times receiving direct state support. These two groups and others willing to engage in nuclear terrorism differ significantly in terms of their aims, motivations, structures, financial arrangements, and openness to external influence, and so warrant a distinct assessment taking these differences into account.</p> <p>"This situation obtains in numerous quantitative studies of nuclear terrorism. For instance, in one survey-based study, 75 per cent of respondents reported the black market route as the most likely pathway for terrorist acquisition of nuclear material. However, this judgement of terrorist group behaviour is conditional upon a wide range of group- and scenario-specific assumptions and factors, none of which are made explicit in the analysis, which thus renders the figure meaningless as a descriptor of terrorist behaviour."</p>	<p>Author(s): Robert J. Downes and Christopher Hobbs</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2017</p> <p>Survey Question(s) Referenced: 7</p>
104	<p>Title: Nuclear Terrorism: What Can We Learn from Los Alamos?</p> <p>Publication (Publisher): <i>Terrorism and Political Violence</i> journal article (Taylor & Francis)</p> <p>Link: https://doi.org/10.1080/09546553.2017.1304383</p> <p>Quote: "Although we expect insider assistance to the terrorist organisation, we assume that no systematically organised state assistance will help in deliberately transferring the fissile material to the terrorist organisation. A state is expected to be reluctant to relinquish control over these expensive and destructive weapons. They might be used in a counterproductive way. Moreover, even a remote prospect of retaliation is likely to have a strong deterrent effect. A survey of 83 nuclear experts confirmed that the 'prospect that a nuclear weapons state might deliberately transfer nuclear weapons or materials directly to a terrorist was seen as the least likely method.'"</p>	<p>Author(s): Brecht Volders</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2017</p> <p>Survey Question(s) Referenced: 7</p>
105	<p>Title: A Probabilistic Analysis of the Risk of Nuclear Deterrence Failure</p> <p>Publication (Publisher): Dissertation (Stanford University)</p> <p>Link: https://search.proquest.com/openview/855e905dce8c79dee2f03492f2c032f1/1?pq-origsite=gscholar&cbl=18750&diss=y</p> <p>Quote: "Experts estimated that the chances of a terrorist attempting a nuclear attack on the US were on the order of 50 percent or more. Yet another estimate suggested 29 percent probability of an attack in the decade following 2006. A poll of security experts had arrived at similar estimates in 2005. Another estimate put the probability of a nuclear attack on a US or European city at 20 percent per year."</p>	<p>Author(s): Jason Christian Reinhardt</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2018</p> <p>Survey Question(s) Referenced: 5</p>

106	<p>Title: Building the Bomb: An Organisational Approach to the Nuclear Terrorism Threat</p> <p>Publication (Publisher): Dissertation (University of Antwerp)</p> <p>Link: https://repository.uantwerpen.be/docman/irua/bd6975/162518.pdf</p> <p>Quote: “Admittedly, various cases of (near) loss of control over nuclear weapons, state terrorism sponsors in conflicts zones, uncertainty with respect to security measures in several states (e.g. Pakistan or North-Korea), and problems with nuclear forensics should suffice to remain aware of this option. Yet, I believe that the counterarguments that stringent security measures are often in place, that attribution to the responsible state is likely, and that a state is unlikely to allow losing control over these unique and destructive weapons still prevail.”</p> <p>In corresponding footnote: “55% of the respondents (nuclear experts) of the 2005 Lugar survey saw the manufacturing of a nuclear device by a terrorist organisation more likely than them stealing an intact nuclear device. . . .</p> <p>“While there is—to my knowledge—no publicly available evidence on a functioning black market that connects smugglers with terrorist organisations, these example do illustrate the possibility of the clandestine proliferation of nuclear technology and material. Yet, the adopted scenario does not expect this to be a standard effort for a terrorist organisation. While such a scenario would not entail the same need for military-style capabilities, it would require the capability to connect to a nuclear black market and organise a transfer. Some of the most likely tasks and activities would be the brokering of reliable contacts, raising a sufficient amount of money, setting up and hiding large financial transactions, and organising the secure transfer of the material.”</p> <p>In corresponding footnote: “Considering this third option, respondents of the Lugar survey generally believed this option to be the most-likely option for a terrorist organisation.”</p>	<p>Author(s): Brecht Volders</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2019</p> <p>Survey Question(s) Referenced: 8, 7</p>
107	<p>Title: Examining the Effectiveness of Risk Elicitations Comparing a Deliberative Risk Ranking to a Nationally Representative Survey on Homeland Security Risk</p> <p>Publication (Publisher): <i>Journal of Risk Research</i> (Routledge)</p> <p>Link: https://doi.org/10.1080/13669877.2018.1501593</p> <p>Quote: “Both experts and the lay public can fall susceptible to biases when considering risks in system 1 [fast, instinctual] thinking. For example, there is a wide divergence of opinions amongst experts in areas of homeland security such as the likelihood of unconventional weapons such as nuclear, chemical, or biological weapons (Lugar 2005; Stern 2008). Some of this may reflect different agendas, but some of this is certainly due to differences in opinion over what are challenging predictions of the future. While this research did not examine expert perceptions, previous research has (Morgan et al. 2001; Willis et al. 2010), including expert perceptions in actual decision-making contexts where differing agendas were in play (Willis et al. 2010). These studies showed that the method was useful at eliciting more informed rankings of risk in expert populations consistent with the results found here. As such, there are opportunities to use the Deliberative Method for Ranking Risks to structure expert consideration of risks—in critical infrastructure protection or in the Quadrennial Homeland Security Review, for example—to create more informed and less-biased rankings of risk.”</p>	<p>Author(s): Willis Lundberg</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2019</p> <p>Survey Question(s) Referenced: None</p>
108	<p>Title: How Likely Is a Nuclear Exchange between the US and Russia?</p> <p>Publication (Publisher): Rethink Priorities</p> <p>Link: https://rethinkpriorities.org/publications/how-likely-is-a-nuclear-exchange-between-the-us-and-russia</p> <p>Quote: “Another expert survey, the Lugar Survey On Proliferation Threats and Responses, asked experts all over the world to estimate the probability of nuclear attack, but over a shorter time span.</p> <p>“The median view of experts estimating the probability of a nuclear attack within 5 years (from 2004-2009) was 10%, or 2.09% per year, and 20% over 10 years (from 2004-2014), or 2.21% per year.</p> <p>“Like the GCR survey, the Lugar Survey didn’t ask experts to consider specific geopolitical scenarios, so again, we can only learn a limited amount about a US-Russia exchange. Additionally, it’s worth noting that the five and ten-year time horizons reflected in these predictions have already passed and resolved in the negative.”</p>	<p>Author(s): Luisa Rodriguez</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2019</p> <p>Survey Question(s) Referenced: 4, 5,</p>

109	<p>Title: Nuclear War as a Global Catastrophic Risk</p> <p>Publication (Publisher): <i>Journal of Benefit-Cost Analysis</i> (Cambridge University Press)</p> <p>Link: https://doi.org/10.1017/bca.2019.16</p> <p>Quote: "One reason for the wide variation [in responses] could be the lack of control of biases in the elicitation of the answers. Without bias control, experts can interpret and think differently about how to answer the question, resulting in wide variability. Even if biases are controlled, wide dispersion can still occur because of high uncertainty in the current state of knowledge. . . .</p> <p>"In other respects as well, the Lugar survey did not follow best practices in elicitation and analysis. While each survey respondent was presumably an expert in some aspect of nuclear policy, arguably no single person is truly an expert on all the factors that must be considered when answering broadly phrased questions such as that depicted in figure 2. Additionally, the survey provides no information about the experts' assumptions, reasoning, and uncertainties. Such information could, for example, be useful in understanding the apparently anomalous peak at 50–59% and the extremes of 0 and 100%. The cumulative impact of these and other deficiencies is that the survey falls short of what could be achieved by using best practices in expert elicitation."</p>	<p>Author(s): James Scouras</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2019</p> <p>Survey Question(s) Referenced: 5</p>
110	<p>Title: Simulated Nuclear Contamination Scenario, Solid Cancer Risk Assessment, and Support to Decision</p> <p>Publication (Publisher): <i>Nukleonika</i> journal article (Institute of Nuclear Chemistry and Technology)</p> <p>Link: https://sciendo.com/pdf/10.2478/nuka-2019-0005</p> <p>Quote: "The terms improvised nuclear device (IND) and hypothetical nuclear device (HNED) are both used to describe a potential nuclear bomb created by a terrorist or emerging rogue state. There are significant challenges in HNED procurement and construction; however, it would not be impossible for a terrorist group to produce a nuclear explosion, and it should be considered a genuine threat given that the potential extreme devastation arguably outweighs the low probability that it will occur. Although theft of a functioning weapon cannot be ruled out, in 2005 a group of 85 subject matter experts marginally concluded that a terrorist group would more likely acquire fissile material than fabricate its own weapon."</p>	<p>Author(s): Sergio Lima, Karolina P. S. Costa, Zelmo R. Lima, Fagner C. Rother, Olga M. O. Araujo, Helio C. Vital, Tercio Brum, Wilson F. R. S. Junior, Jose Carlos C. Amorim, Matthew J. F. Healy, and Edson R. Andrade</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2019</p> <p>Survey Question(s) Referenced: 8</p>
111	<p>Title: Nuclear War, Public Health, the COVID-19 Epidemic: Lessons for Prevention, Preparation, Mitigation, and Education</p> <p>Publication (Publisher): <i>Bulletin of Atomic Scientists</i> journal article (Taylor & Francis)</p> <p>Link: https://doi.org/10.1080/00963402.2020.1806592</p> <p>Quote: "The magnitude of the risk of a nuclear event is hard to estimate. The risk of a single incident, leading to the death of, say, one million people, might be as high as 50 percent over the next 50 years, according to one model. Another widely cited figure is a 2 percent chance per year. A survey of experts found a wide range of estimates of the probability of nuclear war over a 10-year period; only one of the 79 respondents put the risk at zero percent, and 60 put it at over 10 percent (Lugar).</p> <p>"The expected loss from a future event is the product of its probability and its impact, both of which could themselves be assigned probability distributions to represent the associated uncertainties."</p>	<p>Author(s): Andrew Futter, Samuel I. Watson, Peter J. Chilton, and Richard J. Lilford</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2020</p> <p>Survey Question(s) Referenced: 5</p>
112	<p>Title: Safeguarding the Future: Cause Area Report</p> <p>Publication (Publisher): Report (Founders Pledge)</p> <p>Link: https://assets.ctfassets.net/x5sq5djrgbwu/5C1hNPO8RK2E3RzH9dj88M/1fd2c52ab1e534af95c25c5ebea92b49/Cause_Report_-_Safeguarding_the_Future.pdf</p> <p>Quote: "Tensions have declined since the fall of the Berlin Wall, but the risk remains. Politics changes in highly non-linear and unpredictable ways, so it would be premature to rule out the possibility of nuclear war in the future. In a 2015 poll, 50 leading national security experts from across the world estimated the chance of a nuclear war between NATO and Russia of up to 4% in the next 20 years, implying an 18% risk over the course of the next 100 years, if the risk remains constant. Other expert surveys also suggest that the risk is substantial. [Footnote here says, 'See for example Richard Lugar. . .'] Such polls are likely subject to significant subjective bias and selection effects, but at least suggest that the risk is non-negligible."</p>	<p>Author(s): John Halstead</p> <p>Perspective on the Lugar Survey: Questioning</p>	<p>Year: 2020</p> <p>Survey Question(s) Referenced: None</p>

113	<p>Title: Comparative Risk Rankings in Support of Homeland Security Strategic Plans</p> <p>Publication (Publisher): Chapter in <i>Applied Risk Analysis for Guiding Homeland Security Policy</i> book (Wiley)</p> <p>Link: https://doi.org/10.1002/9781119287490.ch4</p> <p>Quote: "Very rare or completely novel risks may rely to a greater extent on expert opinion or models with substantial assumptions). Opinions, even those of experts, may be compromised in a number of ways including the expert's values, mood, and incentives. Consider the Lugar Report, where experts gave estimates for the likelihood a nuclear weapon would be used in an attack anywhere in the world over the next ten years ranging from 0 to 100%; not only is there extreme variation, but these extremes do not even countenance the possibility of the opposite side. While there are methods that are better at capturing expert opinion (such as the Delphi method), they are not used as often as they should be. Consequences can also be estimated through testing (the testing of nuclear bombs for their destructive effect, for example), while likelihood can be estimated through approaches such as game theory. These methods, however, are subject to their own limitations arising from the assumptions made. In all of these cases, estimates of risk associated with very rare or novel risks contain substantial uncertainty – in our hazard set, the range between the lower bound estimate and the upper bound estimate was 0.9 orders of magnitude for common hazards, 1.3 orders of magnitude for rare hazards, and 2.5 for novel hazards."</p>	<p>Author(s): Russell Lundberg</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2021</p> <p>Survey Question(s) Referenced: 5</p>
114	<p>Title: The Nuclear Terrorism Threat: An Organisational Approach</p> <p>Publication (Publisher): Book (Taylor and Francis Group)</p> <p>Link: https://www.proquest.com/docview/2520146183/bookReader</p> <p>Quote: "This book does not focus on the scenario of a terrorist organization stealing or buying an intact nuclear device. This type of scenario would unduly broaden the focus of this book. Admittedly, various cases of (near) loss of control over nuclear weapons, state terrorism sponsors in conflict zones, uncertainty with respect to security measures in several states (e.g. Pakistan or North-Korea), and problems with nuclear forensics should suffice to remain aware of this option. Yet, we believe that the counterarguments that stringent security measures are often in place, that attribution to the responsible state is likely, and that a state is unlikely to allow losing control over these unique and destructive weapons is sufficient justification to focus specifically on the construction and detonation of an IND. [In footnotes:] 55% of respondents (nuclear experts) of the 2005 Lugar Survey saw the manufacturing of a nuclear device by a terrorist organization more likely than them stealing an intact nuclear device). . . .</p> <p>"Some of the most likely tasks and activities would be the brokering of reliable contacts, raising a sufficient amount of money, setting up and hiding large financial transactions, and organizing the secure transfer of the material. [In footnotes:] Considering this third option, respondents of the Lugar Survey generally believed this option to be the most likely option for a terrorist organization."</p>	<p>Author(s): Brecht Volders</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: 2023</p> <p>Survey Question(s) Referenced: 8, 7</p>
115	<p>Title: Human Extinction: What Are the Risks?</p> <p>Publication (Publisher): Video (YouTube)</p> <p>Link: https://www.youtube.com/watch?v=nQVgt5eFMh4</p> <p>Quote: "What do we know about the likelihood of those human-caused extinction scenarios? Pretty much nothing, at least that's my reading of the literature. Take for example this survey that US Senator Richard Lugar sent to 132 experts in 2005. He asked them 'What is the probability (expressed as a percentage) of an attack involving a nuclear explosion occurring somewhere in the world in the next ten years?' The answers of the so-called experts were all over the board from zero to 100 percent, so you might as well not bother asking."</p>	<p>Author(s): Sabine Hossenfelder</p> <p>Perspective on the Lugar Survey: Negative</p>	<p>Year: 2023</p> <p>Survey Question(s) Referenced: 5</p>

116	<p>Title: A Nuclear Reader: Section 3, How Likely Is a Failure of Nuclear Deterrence?</p> <p>Publication (Publisher): Blog post (<i>Defusing the Nuclear Threat</i>)</p> <p>Link: http://nuclearrisk.org/3likely.php</p> <p>Quote: "Former Secretary of Defense William Perry has quoted the odds of a nuclear terrorist attack within the next decade as being roughly 50-50. David Albright, a former weapons inspector in Iraq, puts those odds at less than 1%, but notes, 'We would never accept a situation where the chance of a major nuclear accident like Chernobyl would be anywhere near 1 percent . . . A nuclear terrorism attack is a low-probability event, but we can't live in a world where it's anything but 'extremely low-probability.' In a survey of 85 national security experts, Senator Richard Lugar found an average estimate of 29% for the 'probability of an attack involving a nuclear explosion occurring somewhere in the world in the next 10 years,' with 79 percent of the respondents believing 'it more likely to be carried out by terrorists' than by a government. While even the most optimistic of these estimates is alarming, their wide range emphasizes the need for our proposed in-depth risk analysis studies to reduce the uncertainty."</p>	<p>Author(s): Martin E. Hellman</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: Unsure</p> <p>Survey Question(s) Referenced: 5, 6</p>
117	<p>Title: Nuclear Terrorism and UN Resolution 1540: A South Asian Perspective</p> <p>Publication (Publisher): Working paper (Stanley Center for Peace and Security)</p> <p>Link: https://stanleycenter.org/publications/working_papers/KaziSouthAsianPerspective.pdf</p> <p>Quote: "There is a general agreement among national security experts that terrorists would rather opt to acquire the necessary fissile materials and build a fully operational nuclear device than attempt to buy or steal one. In a survey conducted by Senator Richard G Lugar, 63 of the 83 respondents selected 'black market purchase' as the most likely means from where terrorist might obtain fissile material. Fifty-five percent of those responding saw terrorist manufacture of a nuclear weapon after obtaining material as more likely, while 45 percent believed that terrorist acquisition of a working nuclear weapon was the more probable scenario."</p>	<p>Author(s): Reshmi Kazi</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: Unsure</p> <p>Survey Question(s) Referenced: 7, 8</p>
118	<p>Title: 5 Things to Know About Nuclear Threat Reduction</p> <p>Publication (Publisher): Blog (SilverSide Detectors Inc.)</p> <p>Link: https://silverside-detectors.com/blog/5-things-to-know-about-nuclear-threat-reduction/</p> <p>Quote: "We're not fear mongers; we're realists. In 2006, the Lugar Survey on Proliferation Threats and Responses [.pdf] (a report issued by the Chairman of the Senate Foreign Relations Committee) polled 85 national security experts on the estimated risk of a nuclear attack during the next 10 years. The average response was 29%.</p> <p>"There's no reason to think this threat is reduced. In July 2013, the Director General of the International Atomic Energy Agency (IAEA) said that, 'The threat of nuclear terrorism is real, and the global nuclear security system needs to be strengthened in order to counter that threat.'"</p>	<p>Author(s): SilverSide Detectors Inc.</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: Unsure</p> <p>Survey Question(s) Referenced: 5</p>
119	<p>Title: The Nuclear Fuel Cycle</p> <p>Publication (Publisher): Nuclear Files blog (Project of the Nuclear Age Peace Foundation)</p> <p>Link: https://web.archive.org/web/20221005172537/http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/proliferation/fuel-cycle/index.htm</p> <p>Quote: "The proliferation risks associated with fuel cycle technologies have been known since the dawn of the Nuclear Age in the 1940s. The Baruch Plan of 1946 argues for the peaceful use of nuclear energy and ambitiously proposes international 'complete managerial control of the production of fissionable materials in dangerous quantities.' Recent developments across the globe have refocused attention of the international community on ways to control the proliferation sensitive parts of the nuclear fuel cycle. Highlights of these recent developments include:</p> <ul style="list-style-type: none"> • In January 2003, North Korea announced its withdrawal from the nuclear Non-Proliferation Treaty (NPT) under which it had secretly acquired a nuclear-weapons capability. • In June 2003, the International Atomic Energy Agency (IAEA) declared Iran's failure to fully declare all of its nuclear activities and materials, including the acquisition of centrifuge technology that can be used for uranium enrichment. • In February 2004, the Pakistani nuclear scientist Abdul Qadeer Khan confessed the existence of a global nuclear black market that supplied technology and weapon designs to Iran, Libya and North Korea. <p>"Related to the challenges posed by these recent developments is the ongoing problem of poorly secured fissile material in several countries, most notably in Russia and Pakistan, which increases the likelihood of terrorist acquisition and use. The Lugar Survey on Proliferation Threats and Responses of June 2005 highlights the need to prevent fissile material theft by terrorists."</p>	<p>Author(s): Unsure</p> <p>Perspective on the Lugar Survey: Implicitly positive</p>	<p>Year: Unsure</p> <p>Survey Question(s) Referenced: 19</p>



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